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CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

“EVERY man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruition, the comfortabest part of his own life, the noblest of his sonne's inheritance, a kind of private prince dome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned.”

“Architecture can want no commendation, where there are noble men, or noble mindes.”—SIR HENRY WOTTON.

“OUR English word To BUILD is the Anglo-Saxon Bylsan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places.”—DIVERSIONS OF PURLEY.

“ALWAYS be ready to speak your mind, and a base man will avoid you.”—WILLIAM BLAKE.

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 Alternative Design by Wilkins for University College, LondonFrom an old Engraving.
 Two Designs for Stained Glass WindowsBy Mr. R. J. Steggles.
 The De Bury Monument, Durham CathedralMr. G. H. Kitchin, Architect.

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The Old Church of Chingford, Essex.



HERE were two manors in the parish of Chingford, the chief of which was given by Edward the Confessor to the cathedral church of St. Paul's, and thence became known as Chingford St. Paul's. The church stood on the other manor, which was always in secular hands. Among the holders of this manor, at different periods of its descent or purchase, were several earls, such as the Earl of Gloucester, *temp.* Edward III.; the Earl of Essex, *temp.* Edward IV.; and the Earl of Rutland, *temp.* Henry VIII. Hence it was usually termed Chingford Comitis or Earl's Chingford. The history of the church and rectory, so far as

documentary annals are concerned, is uneventful. The London episcopal registers yield a list of successive rectors and patrons from 1325 downwards. The rectors do not appear to have been men of any special mark.

The old church, which is dedicated to All Saints, and not to Saints Peter and Paul, as usually stated, stands close to the high road leading to Waltham Abbey, eight miles north of London. It is situated on high ground, and the churchyard commands an extensive view over the valley of the Lea into Hertfordshire and Middlesex.

One hundred and ten years ago a careful contributor to the *Gentleman's Magazine*, before the ivy had begun its pernicious work, described this church as in an exceptionally good state of "very sound repair," so that it struck him as appearing "almost unalterable even to time itself." But it had not entered into

the head of "Indagator Londinensis," the contributor in question, to imagine that it would be left to the wisdom of the XIXth century to hand over this admirably built fabric to the stifling cruelties of the freely roaming ivy. Had it not been for the idiotic policy of abandoning this finely constructed example of our forefathers' energy and skill to the tender mercies of this rampant, coarse-growing weed, Chingford Old Church would today, with a trifling occasional expenditure, have been as well-wrought a piece of architecture as it was in 1794. The north-east view of this church, given in the *Gentleman's Magazine* (vol. lxiv., p. 1106), is a singularly poor one, even for that date; but it supplies a fairly accurate notion of the church on its least attractive side, and shows a single root of ivy at the junction of chancel and nave, which was, however, even then beginning to climb on to the roof.



Fig. 1. Chingford Church (1903).

In a quarto publication issued in 1811, entitled "Ecclesiastical Topography: a Collection of One Hundred Views of Churches in the Euvirons of London," Chingford is the last church delineated. The view in this case is south-east. The ivy, even at that time, is depicted as singularly luxuriant on chancel, nave, and porch. The letterpress describes the building as "most remarkable for the beauty of its appearance," but adds that it "is almost entirely overgrown with ivy."

Wright's "History of Essex," which was published between 1831 and 1835, supplies a good steel engraving of this church, which is also taken from the south-east, showing how much it was then shrouded in ivy, which rose in two places to the top of the tower.

In 1844-5 a new church of white brick, and singularly feeble design, was built at Chingford Green, about a mile to the north of the parish church, when, by a most unhappy decision, it was arranged to abandon the main body of the old church so far as any use of it was concerned, the chancel being walled off for occasional services. These fitful services in the chancel were held from time to time until about ten years ago, when they altogether ceased. Meanwhile the ivy was allowed to wanton at free will over the south porch, south aisle, and nave; vast entanglements rising from the great snake-like stems, clutching the roofs in deadly embrace. If any ventured to remonstrate, of late years, pointing out that the fabric was being stifled to death, "the extraordinary picturesqueness" of the ivy and masses of decayed vegetation were held to justify its continuance. The parish as a whole seemed enthralled by the supposed beauty of this heap of rampant greenery, and allowed

the ivy to continue its deadly work outside, whilst they foolishly attempted to prop up the building from within by a variety of timber supports.

At length the long-expected crash came, and in the bleak, windy weather of last February the roofs of nave and south aisle gave way, dragging with them in their downfall no small amount of masonry and shaking the rest, so that this ancient, well-huilt church is now a sad and deplorable ruin, save for the chancel and tower. It is altogether beyond ordinary repair, and an expenditure of thousands would be required to effect a decent restoration. Unless the ivy and the mass of decayed matter on the roof are speedily removed from the chancel, that, too, will ere long be prostrate.

The church consists of chancel, nave, south aisle, south porch, and west tower. Rough measurements give the size of the chancel as about 18 ft. long and 21 ft. wide. The nave, of three bays, is the same width and 51 ft. in length. The south aisle is about 12 ft. in width; the west tower has a square of 15 ft. Contrary to what is usual with the old churches of this district, where flint so largely prevails, most of the fabric of Chingford church is of good stone. A careful examination of the squared stones shows that a considerable proportion bear distinct traces of Norman axeing, proving that there was a well-huilt church here as early as the XIIth century. When the new church was built in 1844-5, the font was moved from the old fabric. It is a good example of late Norman or Transitional work. The font itself is a squared block of Purbeck marble, standing on four small angle shafts with moulded bases and a

larger central shaft. Each side is arched into five divisions. Unfortunately, when it was removed the top 3 in. were renewed; it may possibly have been necessary to renew some decayed portion, but it surely would have been simple to obtain some harmonising or like material, instead of employing for the new work a marble which is embellished with pink streaks.

There does not seem to be anything left in the fabric that tells of either Norman or Early English work; but the doorway of the south aisle, under the porch, and other details show that this aisle was either built or rebuilt towards the close of the XIIIth century, *temp.* Edward I. This doorway has a single stone shaft nearly detached in each jamb, and some good characteristic mouldings. Of the arcade that divided the south aisle from the nave only a single pier, with corresponding respond, is now standing—namely, that at the east end. The pier is circular, and of the same date as the doorway.

Probably a Norman nave and chancel sufficed for worship on this site until the reign of Edward I. John, Earl of Athol, who then held the manor of Earls Chingford and the advowson of the rectory, forfeited his lands to the Crown by espousing the cause of Robert Bruce, when Edward I. gave the manor to the Earl of Gloucester. It was at this juncture of affairs in local history that the south aisle was built and the church otherwise improved. There are signs about the tower that point to this being the period when a west tower, in place of a mere bell-gable, was first erected.

In the latter half of the XVth century this church underwent a thorough rebuilding. The chancel appears to be

irely new work of that date. In each wall are two two-light windows, with pressed arches. The three-light east window has been renewed, but the jambs are original. There is a well-moulded west doorway on the north side, with a nearly circular head. The north wall of the nave was about the same date built; the two three-light windows have the same character as the chancel, and so has the north doorway of the north bay. The buttresses of both nave and chancel have been remarkably well built; in fact, the whole work of that date, though not enriched, was exceptionally good. The west tower, of like date, is of two stages, unbuttressed, and with an embattled parapet. There is a large angle light, with cinque-foiled head, in the west wall of the basement; the north and south walls are unperforated. The belfry stage has a two-light window on each face. The guide-book to the county bids us to be much Roman brick in the tower masonry. But there is no Roman brick to be noticed; here and there pieces of Roman mediæval tiles have been utilised in the building. The only place where we detected possible Roman brick or tile was in the south-east buttress of the aisle, where two large fragments, apparently Roman, were obtruding. If it was not for documentary evidence, we should have been inclined to put this considerable rebuilding in the last quarter of the XVth century. The will, however, of one Benet Harlewyn, of this parish, proved in the year 1460, shows that the building of the chancel was then in progress. The exact wording is:—*Lego versus fabricam novi cancelli sive chori ecclesie parochialis de Shingilford iijjs ijd.* Probably the nave was taken in hand when the chancel was finished, and then the tower.

The windows of the south aisle seem to have been renewed at a later date, probably circa 1500.

To the reign of Henry VII., or possibly Henry VIII., the really admirable red brick porch must be assigned, with its beautifully moulded doorway and good three-light windows on each side. We believe it to be about the best brick church porch of pre-Reformation date left in East Anglia, if not in all England. Now it has been possible for rectors, churchwardens, and other inhabitants of Chingford—to say nothing of extra-parochial rural deans and archdeacons and other diocesan authorities who are supposed to look after church fabrics—to go on year after year suffering, nay, encouraging, these vast stems of ivy to be grinding through and over this remarkable porch, almost passes the wit of human understanding. One of the ivy stems shown in the photographic plate exceeds 2 ft. in circumference, and another is exactly that measurement. In the west side of this porch a great gnarled elder-bush, of long-standing growth, springs out of the foundation. The roof and walls of this porch are now so rent about that its salvation is well-nigh impossible. As if any miserable outhouse or commonplace modern barn could not be equally effective to display what ivy can do, if the Chingford folk were determined to have this desolating sight of greenery. Ivy can grow and will grow anywhere; but the ancient

time-worn masonry and brickwork of our forefathers—apart from all sacred associations—can never be replaced.

Of the few remnants of old-time worship that the crumbling inner walls of this church still retain, a plain piscina drain may be mentioned at the east end of the south aisle, and the niche for a holy water stoup to the east of the north entrance.

That distinguished Essex ecclesiologist, the late Mr. H. W. King, told a sad story, in the second volume of the Essex Archaeological Society's *Proceedings* (1863), of the depredations made on this unhappily deserted church. In the chancel were the Elizabethan effigies in brass, with an inscription plate, of Robert Rampston (1585) and Margaret, his wife (1590). Robert Rampston was in plate armour and his wife in the elaborate costume of that date. These brasses were not only valuable as excellent examples of the armour and dress of the times, but had a special historical and local value. Robert Rampston, who had served as Yeoman of the Guard to Edward VI., Queen Mary, and Queen Elizabeth, was a great benefactor to the poor of the whole district, and a mural plate recorded his benefactions to Chingford and ten other parishes. A thief made away with the benefaction plate in 1857; encouraged by his success, he soon afterwards paid a second visit, and carried off the two effigies and the inscription. When Chingford church

was dismantled these brasses had been removed from the east end of the south aisle and placed in the chancel.

The old chancel still retains a variety of XIXth and XVIIIth century mural tablets and floor slabs, as well as some ragged batchments. They are chiefly to the families of Boothby and Leigh. Three of Jacobean date have lately been removed to the south wall of the church at Chingford Green. The most remarkable of these is that to Mary, wife of Robert Leigh; and daughter of Henry Josselin, of Torrells Hall, Essex, who died in 1602, apparently in child-birth. The lady is represented lying in bed, with curtains, suspended from a tester, half drawn back; on the coverlet, outside, lies the small figure of a child wrapped round with the chrisom cloth. The inscription, now nearly illegible, has an epitaph assigning to this lady every possible virtue—

Marye the wyfe of Robert Leigh Esquier
Payes here the debt that Nature doth requier
Whoe lived a mirror, for a godly life,
And dyed a wonder, for a loving wyfe,
A boddye chaste, a vertuous mynde:
A temperate tongue, an humble harte:
Secret and wyse, faythfull and kinde:
Trew, without guile, mild without arte,
A frende to peace, a foe to strife.
A spotless dame, a matchlesse wyfe,
Loe heere her trewe anatomye:
And for her birth of gentlerie;
Shew Josyphs height, of Torrells race:
Each tribe did give her equal grace.

The views of the church before and after the collapse are from photographs by C. A. Samuels, of Angel Road, Edmonton.



Fig. 2. Chingford Church (March, 1904).

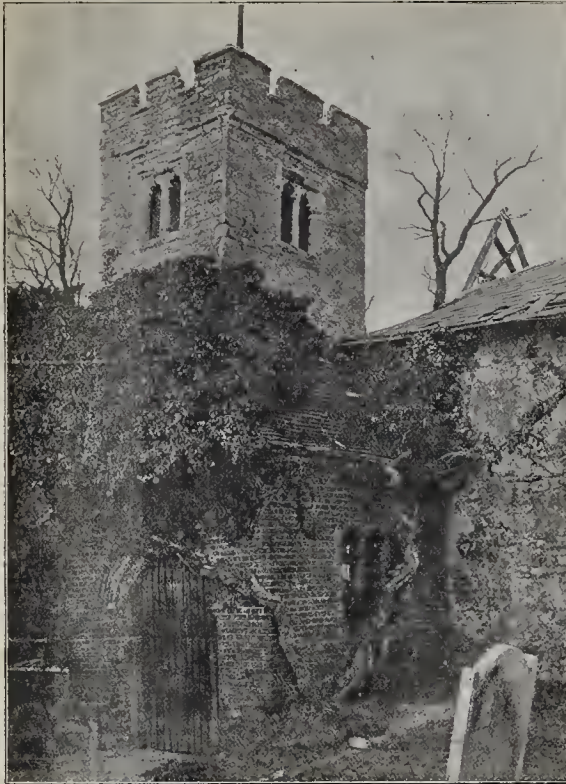


Fig. 3. Chingford Church: The Ivy-weighted Brick Porch. (See page 3.)

NOTES.

The Architect of the Government Offices.

THE honour of knighthood bestowed on Mr. H. Tanner of the Office of Works seems to have started the daily press with their usual blunders about architects, the *Daily Telegraph* having given out that Sir H. Tanner was architect of the Government Offices in Great George-street. The editor of this journal wrote a note to the paper in question pointing out the mistake and the injustice to the memory of the deceased architect, the late J. M. Brydon; a letter which the *Daily Telegraph* did not publish. In the daily papers it seems to be supposed that mistakes about architects and architecture may be safely made, since the public care nothing about these subjects, and do not mind whether the papers are right or wrong. The honour paid to the chief official architect of the Office of Works would be more in place if one did not think of the number of far more eminent architects who are yearly passed over by the Government without any recognition of their existence.

The Exit from the Royal Academy.

A FEW days ago an architect, Mr. W. A. Forsyth, wrote to the *Times* drawing attention to the danger to the visitors to the Royal Academy, in case of any sudden alarm of fire, from there being only one exit, and that barred by turnstiles, and suggested the substitution of "several exit doors."

It is hardly fair to charge this danger against the Royal Academy rooms only, as it applies equally to the National Gallery and to the New Gallery, with the exception that the latter is smaller and holds fewer people. But admitting the wisdom of the suggestion in the abstract, how is it to be done now? In the case of the Royal Academy rooms, it would mean remodelling the whole building, or else breaking through the front walls on the first floor and putting exterior staircases on the courtyard front, which would be a terrible architectural blemish to the front as now existing. Such arrangements can only be carried out properly when a building is planned for them *ab initio*. As it is, all that could be done now is to see that the barriers and turnstiles are easily removable. They are not permanent, as they are removed for the Private Views and the Soirée; how long it takes to remove them we do not know. If they are fixed so that they can be removed in a minute or two, that is all that can be done now; though Mr. Forsyth's letter may have done good in calling attention to the point.

Charges on Property for Street Improvements.

ON February 21, 1903, we had occasion to call our readers' attention to a decision of the Court of Appeal in the case of *Surtees v. Woodhouse* as to the time at which expenses incurred by local authorities under the Private Street Works Act,

1892, become a charge on the premises, and it was then decided that they became so charged at the time the works were completed and before the final apportionment under section 13. In the recent case of *in re Allen and Driscoll's contract* a similar question has had to be decided under the Public Health Act, 1875. Specific performance was being enforced of a contract to purchase certain property, and under the contract the vendors were liable to pay outgoings up to September 29th. The District Council, having called on the owners, under section 150, to pave and make up the road, in default of this being done had themselves contracted to have the work done, and the work had been partially performed and partially paid for by the Council before September 29. The question arose as to whether the purchaser or the vendor was liable for these expenses, and the Court decided they fell on the purchaser, since he was the owner "when the work was completed"—the words used in section 257 of the Public Health Act, 1875.

Trees and Houses.

A CASE (*Smith v. Giddy*) which is of special importance to those who live in villas was decided by the King's Bench Division last week. Mr. Jones (as we will call him) allowed his trees to overhang his neighbour Mr. Brown's premises, and the latter claimed in the County Court damages and injunction to prevent the continuance of the alleged nuisance. The County Court judge, however, decided that Jones's proper remedy was to "abate" the nuisance, in other words, to cut back the overhanging trees. This, of course, is a good old mediaeval remedy, and one which has a tendency to cause personal conflicts. The Divisional Court, when the matter came before them on appeal, decided, however, that, though there was no direct precedent for such an action as this, yet that on principle it could be maintained. This is obviously common sense. The right to "abate" the nuisance implies a right to stop it, and the right to do so by legal means is the modern and civilised means of so doing. But the knowledge that trees in villa gardens must not be allowed to overhang adjoining grounds, and that a County Court may now prevent it, is a fact of considerable importance.

Motors and the Roads.

THIS being the first dry season since the motor came into such vogue, the attention of dwellers in the country is being most seriously called to the dust nuisance. This question is not one solely of convenience—ladies, children, and dogs are beginning to learn that the public roads can no longer be used by them either with safety or with any enjoyment—but all house property abutting on main thoroughfares is seriously depreciated in value. Such houses can no longer be let during the summer months, and it also follows that their market value is depreciated to such an extent that many of them are unsaleable. The fact that our roads are entirely unsuited to such high-paced traffic, is recognised even by the motorists themselves, but the only

remedies suggested have been reconstruction of the roads, which is impracticable, or a treatment with oil, which would only make the country roads more unbearable than they are at present. On thoroughfares frequented by motor traffic it is no longer safe for a lady to drive herself unaccompanied by a groom; this is in itself a deprivation to many people of small income, but in dry seasons it is further impossible for her to be driven out in an open carriage at all, and the only cure at present seems to be for her to go to garden parties in a close carriage, or to take refuge in the extraordinary garments adopted by the motorists themselves. It is to be hoped this dry weather may continue until our legislators are released from their labours at Westminster and betake themselves to their country seats, when they will have practical ocular demonstration that much dust was thrown in their eyes in connection with the recent enactments legalising such high speeds.

The Twisting Effect of Lightning. SOME interesting particulars stated in a recent letter to the *Standard*, relative to the action of lightning at Earl's Fee, Essex—have called forth reminiscences of similar effects from several correspondents to the same paper. Most of the occurrences in question exemplified the phenomena exhibited by what is termed "globular lightning," but in the opinion of Mr. Killingworth Hedges, who has this week written a letter on the subject, the incident at Earl's Fee was not due to this cause. Mr. Hedges takes the opportunity of reminding his readers that a lightning flash often divides into several distinct flashes, which, in the case of a building, accounts for its being struck in more than one place at the same time. The twisting effect of lightning is often shown by the displacement of masonry, and Mr. Hedges records an instance in which the spire of a church was rotated bodily through a small angle without being overturned. The most important point suggested by the letters describing the bursting of globular lightning into zig-zag flashes, as well as by the letter of Mr. Hedges, is the absolute necessity of protecting buildings by a connected series of conductors so that every part of the structure may be properly safeguarded.

A Great Indian Dam. We learn that an irrigation dam of most imposing proportions is about to be built across the Tungabhadra River, in the western part of Madras. Rising in the Western Ghats, the Tungabhadra follows an eastward course of some 400 miles from its source to the sea, and, according to the scheme now formulated, will be barred near Hospett by a dam nearly a mile in length and about 150 ft. high. This stupendous work, although not quite so long as the Aswan dam in Egypt, will be considerably higher, and will form a reservoir covering an area of about 150 square miles. The volume of water so held up is calculated at 200 milliard cubic feet, or between five and six times the capacity of the Aswan reservoir. The cost of the undertaking is estimated at about 3,500,000*l.*, an expenditure that it is confidently believed will be amply

justified by the increased value of land in the surrounding regions of the Presidency.

The Subsidence of Boston, U.S.A. ACCORDING to Mr. J. R. Freeman, a well-known American engineer, the city of Boston is slowly sinking. It is stated that the present datum, locally known as the "Boston base," so far as can be ascertained, was in the year 1830 at the same level as mean low water at Charleston. In the present day the same datum, as defined by various bench marks on solid ground, is 0.79 ft. below mean low water level. Granting the accuracy of these measurements, it is evident that the ground in the neighbourhood has been sinking at the rate of more than 1 ft. per hundred years. Although not a matter of immediate importance to the inhabitants and land-owners of the city and metropolitan district of Boston, the question is one of much interest, and may have to be taken into account by those who are concerned in the design of constructional works that are intended to endure for centuries to come.

St. George's Hospital and its Rebuilding. At a Special Court, held on Tuesday in last week, of the governors of the hospital, to consider the reports of a committee appointed in March last year, a resolution was passed by a large majority in favour of non-removal from the present site. In the course of discussion it was stated, upon the basis of reports supplied by Mr. H. Percy Adams, architect to the governing body, that the estimated cost of a new hospital amounts to 325,000*l.*, a total which includes 225,000*l.* for buildings to contain 350 beds, with medical school and nurses' quarters, 50,000*l.* for ten acres of land, and 50,000*l.* for contingencies, legal expenses, etc. It was resolved, further, to utilise the recently acquired property in St. George's-place, Knightsbridge, for buildings to form portion of a complete scheme of a new hospital, and to enter into negotiations with the Duke of Westminster for the purchase of adjoining leaseholds, at a price of 23,700*l.* The question of building ground is somewhat intricate. Briefly stated, it stands thus:—The governing body own the freehold of 26,145 sq. ft. of the existing entire site of 61,645 sq. ft.; they hold 17,600 sq. ft. opposite Green Park at a nominal rent under a lease from the Duke renewable in perpetuity so long as that site is used for hospital purposes; and a similar provision will obtain in respect of the third portion, being 17,905 sq. ft., which they hold from the Duke at a peppercorn rent under a lease until Michaelmas, 1906, with an option to purchase it after that date for 23,700*l.* The hospital was built in 1828-9, from plans and designs by W. Wilkins; Arthur P. Mee added an upper story and a new wing in 1859-68; eight years ago Mr. H. Percy Adams added the southern block, embracing the nurses' rooms, offices, etc., built the small (west) operating theatre, and remodelled the large (east) operating theatre. In the Foundling Hospital is a painting by Wilson, 1746, depicting the original hospital, formerly the house of

Lord Lanesborough, facing Hyde Park, which a committee leased for an infirmary in 1733-4, and enlarged by the addition of two wings after Isaac Ware's designs, as shown in his own print of 1733, and in the coloured print, after a drawing by Dagaty, published in 1797 by Ackermann.

Mr. Neville Lytton's Exhibition. At the Carfax Gallery, 17, Ryder-street, is a collection of works by the Hon. Neville Lytton, which, as the productions of a new artist, are of no little interest and promise. There are a considerable number of small sketches of landscape and buildings in water-colour on toned paper, which show a very broad and free style and a great feeling for composition. There is perhaps a little suspicion of the imitation of an old style about them; "Eashing Bridge" (32), for instance, might almost be labelled "Girtin"; but there is real artistic power in them; "Trees at Rake Mill" (14), for instance, is a beautiful sketch. The buildings which form the subjects of some of the sketches are very well treated. Then there are drapery and figure studies; some fine studies of draped figures and some good nude studies; but why does an artist who can draw so well as in some of these figure studies, allow himself to put in such carelessly drawn hands as in Nos. 21 and 46? A tempera painting called "Patience," of a lady seated with cards before her, is a remarkable and most original piece of decorative painting, executed on a dark gesso ground covered with a diaper design in slight relief. There are several small-scale portraits and one or two life-size ones. Mr. Lytton is evidently at present in an experimental and tentative stage as an artist, and has not quite found his style yet; but he has talent enough to accomplish much when he has settled what to aim at.

The Modern Gallery. At the Modern Gallery is a collection of pastel and water-colour drawings by Mr. Laurence G. Linnell, and water-colour drawings by Miss Elizabeth M. Chettle. Mr. Linnell's are chiefly about the region of Davos, St. Moritz, and Locarno. One of the larger ones, "Winter from the Rhoetian Alps" (19), with the snow mountains rising behind the nearer pine-covered hills, is a fine picture, and he is successful in a good many snow scenes, which seem to be rather a special class of subject with him. But, after all, the best things in his collection are the few English scenes, which are exceptions, such as "Hayfield on the Suffolk Marshes" (37), "A Suffolk Hayfield" (84), "The Wet West Wind" (64), and one or two others. In "Olney in Flood" (105) the spire (as one often finds with landscape painters) is not upright. Miss Chettle's small water-colours, much less ambitious in subject, are undoubtedly the best part of the exhibition, and are of quite unusual excellence of their kind. They are little corners of English landscape in which there is much detail of foreground foliage, painted as by one who loves it. Among these "A Wild Rose Hedge" (109), "A Grey Day in the Woods," "A Spring Moon" (114), "Thistledown and

Butterfly" (117) (the property of Sir L. Alma-Tadema), and "Sallows" (125) are beautiful; and still more so, in another way, is "Sheep on the Sussex Downs" (121), a more extended landscape of a different type from most of the others. Miss Chettle is a true artist, both in poetic feeling and in the conscientious execution of her small pictures.

Mr. E. G. CRAIG'S exhibition of designs for scenes and costumes for the theatre and other drawings in Trafalgar Studios, Manresa-road, is representative of the best class of theatrical art. To successfully cope with the technicalities of staging such scenes is a task much more difficult to overcome in this country than in some of the continental theatres, [where mechanical aid is so much more advanced. It is to be hoped that the effects which Mr. Craig has so well conceived on paper may be possible of actual production. The delightful grey in which he so revels is used perhaps most strikingly in the designs for "The Vikings"; and some of the Masque designs, and the low-toned, rich simplicity of the Shakesperian scenes, show an admirable repose of effect. The illustrations of Dumas—"Porthos," "Aramis," and "D'Artagnan"—are good character studies, expressing the spirit of their lives and time. Of the country subjects, all of which are exceedingly clever drawings in black ink and colour, we may mention "Pontingford," a simple study of trees and distance; bits from Hampton Court, etc. There are also a few woodcuts of characteristic merit. The simple charm and rest of Mr. Craig's work is, we think, sometimes marred by evidence of what one may call an Aubrey Beardsley influence, which is occasionally somewhat marked, and seems foreign to the spirit of his natural expression.

The Society of Arts, this year as last, held its annual Soirée in the Botanic Gardens, which were most beautifully and effectively lighted for the occasion, and fortunately the weather was suitable for a garden party. The guests were received by Sir W. Abney and the members of the Council. The entertainments consisted of the performances of the Royal Artillery Band in the conservatory and of the Irish Guards Band in the garden, and a concert of singing and handbell ringing in the club-room. Mr. Tipper's handbell solos, with a pianoforte accompaniment, constituted what in its way was a most finished artistic performance—just the kind of thing, too, for an occasion of this kind, when one wants the fanciful rather than the serious element in music.

This annual evening reception at the rooms of the Royal Academy came off with its usual success on Wednesday evening. The early arrivals were received by Mr. Yeames and Mr. Frampton, the President not having been able to attend till later. There was the usual crowd and the usual meetings of friends in the artistic and social world (for the Academy soirée is a great opportunity for agreeable surprises

and unexpected recognitions), and the usual band of the Royal Artillery, whose playing, by the way, seemed even better than usual.

LETTER FROM PARIS.

The Society of the "Autumn Salon," which in October last obtained the use of the ground floor galleries of the Petit Palais for an exhibition which was not very successful, intends to organise a second exhibition this year in the Grand Palais. The Société Nationale des Beaux-Arts (New Salon), several members of which had taken part in the "Autumn Salon," regards the latter exhibition, authorised by the State, in the light of a rival, and has forbidden its members to take part in any other exhibitions which may be organised in either the Grand or Petit Palais. This measure will place further difficulties in the way of the "Autumn Salon," which was in fact but a very poor attempt at an exhibition. It will, on the other hand, be likely to injure the "Société des Artistes Decorateurs," which held in December last a very interesting exhibition of industrial art, especially in regard to the decoration of rooms, and which the municipality intends to encourage by giving it, at the close of this year, the use of part of the galleries of the Petit Palais.

A Committee has been formed to purchase the statue of "Le Penseur," by Rodin, exhibited this year at the New Salon, and to offer it to the municipality, which however has not in any way solicited this rather doubtful gift. Outside of the circle of the extravagant admirers of Rodin, there are a good many people who do not see the suitability of this work as a public statue erected in the streets. They think it might do very well in a museum—the Luxembourg or the Petit Palais, but what æsthetic or philosophical purpose would it serve in such positions as the Place de la Trinité, or, as its admirers demand, behind the Opera-House and in the neighbourhood of the Garnier monument? This ill-regulated enthusiasm of the ultra-Rodinites reminds one of the celebrated speech—"I can look out for my enemies, if only Heaven will preserve me from my friends."

On the occasion of the race for the Grand Prix de Paris, the new tribune of Longchamps, from the design of M. Girault, was inaugurated by the President. The general effect of this structure, flanked by the new public tribunes also designed by M. Girault, is exceedingly good. A central vestibule leads to a large and richly-furnished salon, opening on the tribune itself, separated from the race-course by a verandah. Above the salon is an upper story, with its tribune entered from a salon oval on plan; and above all is a second story with a terrace from which a view can be obtained of the whole race-course, with extensive views also over the woods and hills of Meudon and St. Cloud.

The new north and south metropolitan railway, from Montmartre to Mont-Parnasse, is at last on the eve of being commenced. Parliament, before it rises, will pass the vote for the construction, the joint work of the engineers, M. Berber and M. Jametot. The works for the construction, the joint work of the engineers, M. Berber and M. Jametot, can therefore be soon taken in hand, and the *chantiers* will open at the beginning of the coming winter. It will ensure employment, during its construction, for an army of labourers, and will be of real advantage to the population of Paris when completed.

The Curator of the Cluny Museum, M. Edmond Harancourt, is undertaking some useful re-arrangement of the collection. The ground floor rooms adjoining the entrance will be devoted to the exhibition of new objects either given, lent, or purchased. The sculpture is to be methodically classed in its chronological order. The examples of Gallo-Roman, Romanesque, and Early Gothic art, will occupy the galleries called the Thermes de Julien. Late Gothic work will be arranged in the lower chapel; and Renaissance work in the arcades of the courtyard and in a loggia. The new arrangement will allow of the exhibition, in a well-lighted hall, of a fine set of gold-thread tapestries of the XVIIth century, hitherto kept rolled up and inaccessible to the public. The gallery called "Salle de la Licorne" is to be given up to church plate and enamels. In the smaller galleries are to be collected, in a systematic manner, a number of objects now scattered about in the museum, which will be brought

together so as to convey an idea of the total effect of interiors of different epochs. The Service des Beaux-Arts of the municipality would gladly undertake a similar treatment of the Hôtel de Lauzun, so as to restore, with its original furniture, and with hangings, etc., of the same date, the abode of a French "grand seigneur" of the XVIIIth century; but unfortunately there are no funds available for the purpose at present.

The Vieux Paris Committee, the meetings of which have been interrupted for some time by the municipal elections, is to occupy itself shortly with the subject of the celebrated château d'Issy, built by Bullet, and burned in 1871, and of its large park designed by Le Nôtre. It is desired that the remains of the château should be turned to some account to adorn a square in Paris, as fragments of the old Hôtel de Ville and Tuileries are now erected in the Parc Monceau and at the Trocadero. Among the things which might be thus preserved are the fine principal gable or *fronton* (somewhat injured by the German bullets), a fine iron gate wrought iron grille. The Committee is also taking up the case of the curious old building at the angle of the Rue de Poissy and the Rue des Ecoles, once part of the convent of the Bernardines, founded in 1245 by the Abbé Etienne of Lexington. The church was partly destroyed in the Revolution. The Refectory became a warehouse, and the Dormitory a repository of municipal archives. The last transformation of this ancient monument was to become a Fire Brigade barracks. It is now proposed to make of it a museum of Parisian antiquities, and it is hoped that the Municipal Council, to whom a memorandum on the subject is to be presented, will approve and enter into a scheme to treat this ancient building in a manner more worthy of its historical associations.

M. Henry Marcel has commissioned a certain number of sculptors, among whom are MM. Dubois, Peynot, Gasq and Verlet, to produce models for statues to decorate the Park of St. Cloud. These statues, which are to symbolise the Hours, the Days, and the Seasons, are to replace the allegorical statues partly destroyed by shell-fire in the Franco-German war. Now that the last vestiges of the burned château have been removed, it is thought indispensable to give the park some sculptural decoration.

M. Tournaire, the architect to the Department of the Seine, is engaged in elaborating a programme for important additions to the Palais de Justice, at an estimated cost of nine million francs. The scheme will necessitate the erection of new buildings between the Rue de la Sainte Chapelle and Quai des Orfèvres. These will permit of the formation of five new "Chambres Correctionnelles," and a better organisation of the judicial service generally. We shall have occasion to return to the consideration of M. Tournaire's scheme when it is in a more advanced stage. It is at present the only public architectural scheme under consideration by the State or the Municipality which is of any special interest.

LIVERPOOL COTTON EXCHANGE COMPETITION.

LIVERPOOL has of late years added many fine buildings to its street architecture, and is now about to augment the list with a design which will rank as one of the best of the more important recent commercial buildings in the country.

The new Cotton Exchange and offices will be erected on an "island" site, having narrow surrounding streets, and although the position is not a prominent one in the city, the main front will face Old Hall-street, a thoroughfare which is undergoing improvement year by year. The adjoining rights of light have considerably affected the scheme, necessitating the recessing of the upper parts of the main and south-east side fronts.

The accommodation will comprise—on the ground floor, a large exchange, with which are arranged rooms for telephones, cables, and post-office, and members are to have a committee-room, smoking and reading rooms. On the first floor the board-room and secretary will be located, whilst the top floor will accommodate the clearing-house, bank, arbitration and appeal rooms and lavatories. A *café* is to be included, and the remainder of the site is to be occupied by offices and sample rooms to be let for cotton business. No limit

was stated as to cost, but the financial aspect in the letting of offices was, to a certain extent, a governing factor.

In the competition for designs, for which local architects only were eligible to compete, twenty-four sets of plans were submitted, all of which possess remarkable similarity in the main lines of the scheme, which is not altogether due to the restrictions imposed by the conditions. The standard of design is good, bearing in mind that it is drawn from a restricted area, but the general tendency displayed is to produce a building suited to a more spacious site.

In the award recently made public, the assessor, Mr. E. G. Briggs (Messrs. Briggs and Wolstenholme), of Liverpool, recommends the adoption of the design No. 22, by Messrs. Matar and Simon. We understand that the Association has confirmed this selection, with which, we may add, we are in entire agreement.

Dignity is essential in a building of such importance, and the authors of the chosen design have secured this element by clever and at the same time bold strokes in planning what is without doubt a complex problem. The feature of the main front, as shown in the perspective view, is a large open colonnade, behind which is a blank wall, serving no other purpose than that of screening the roof of the Exchange; pavilions, containing staircases and lifts, are placed at either end of the front, and rise as small towers above the parapets crowned with large globes supported by groups of figures. The balustrade, although regulated by the segmental pediments of the pavilions, is barely high enough, and we should have preferred a straight in preference to broken skyline; in other respects we have nothing but commendation to bestow. The low front building, which is seen in all the designs, is here indicated as a loggia with enclosed ends, giving approach to the vestibule, beyond which is the Exchange proper. The point of view taken for the perspective drawing, although fixed on plan by the conditions, is considerably above street level, and has the advantage of displaying the full contrast of the plain rusticated wall and the super-imposed colonnade; the actual value of this will not be appreciated from the street level owing to the foreshortening due to the low building. The authors have wisely kept all the small scale parts of the plan away from the main front to avoid disturbance in the breadth of treatment, and here lies the key to this excellent design.

Again, no attempt is made to produce an elevation fronting the narrow Ormond-street, and the upper floors of the offices are grouped laterally across the site, which secures the maximum light and air both to the new building and to the adjoining property. It, moreover, obtains the north and east aspects specially required for the tenants. The plan of the Exchange, which is the best of those submitted, has the members' telephones and cable rooms opening directly from it, and arranged on the side street so that light and air are obtainable from sources other than overhead. Members' smoking and reading rooms are placed behind the Exchange, but the position and aspect are not altogether desirable.

Of the weak points of the plan, we should say that the corridors and offices on the second and third floors, lighted and ventilated from the space between the ceiling and roof of the Exchange, facts carefully omitted from the plans, are of no great value; that the double roof referred to is unnecessary; that the members' lavatories are quite inadequate; and that the *café*, as well as other parts of the basement, have insufficient light and height. These, however, are blemishes which can be removed in the working out of this good scheme. The Sixth and Edmund-street fronts consist chiefly of offices, and are designed in an up-to-date cast-iron manner, upon a stone base, and placed between stone masses rising at the angles and other intervals, and the result promises to be successful. The $\frac{1}{16}$ th scale details, the tinted $\frac{1}{2}$ in. and $\frac{1}{4}$ in. scale details, and the general view are all delicately drawn.

The second place is given to the design by Mr. Richard Holt, with a premium of £250. The exterior shows a strong influence of the work of Mr. John Belcher, A.R.A., and in particular of his design for the Royal Assurance Buildings in Liverpool, which we published on March 21, 1896, and April 4, 1896. The low front building contains two floors of offices, and has angle entrances provided for the use of the ordinary office accommodation.

A central entrance hall is entered from the street, and to the left and right on entering are placed the committee-room, telephones, and post-office. Beyond the Exchange is a large room, of very small height, filled with telephone enclosures and cable compartments, the lighting of which is impossible. Light in the Exchange is to be derived from a series of small skylights and a central dome light. The author appears to realise, as we do, that the air and light in this, the important space, will be inadequate, and he therefore indicates borrowed lights in the section as external windows, but the plan shows the futility of such a proceeding. No fireplaces are provided in the smoking and reading rooms, which is an omission that cotton brokers would resent. The *café* has practically no daylight. The lateral blocks of offices are placed so closely together as to rob each other of light; the author feels this, for he has contrived a combined window and skylight, which is a costly arrangement necessitating the setting back of each floor.

The board and secretary's rooms are well placed on the main front, and the separate staircase ascending from the Exchange with which a balcony is contrived is a good feature. A free use of classic detail is employed in the fronts, from which the usual dominant order is welcome by its absence. The grouping and details are excellent, but the scheme is sadly deficient in the plan and hardly merits second place.

Messrs. Grayson and Ould secure the second premium of 150*l.* with design No. 20. This scheme follows No. 15 in essentials, but is inferior in style. The principal front has two open domes terminating the main angle projections, whilst the central interest consists of a flat convex break in the building line. The business and members staircases also occupy prominent positions on this front; these are lighted by ranges of small windows, and are further expressed on the exterior by raking stone strings. Various other details suggest the use of stock classic features introduced in a design which lacks cohesion. The width of Ormond-street is much exaggerated in the perspective drawing to give a full view of a side elevation which would otherwise never be seen. An interesting point of the plan is a top-lighted loggia between the hall and the exchange. Two very important departments, however (board and secretary's rooms), receive little consideration, but the scheme generally is well worked out and the fireplaces throughout suitably arranged—a provision not made by all the other competitors. The planning could be made simpler, but the design is disappointing taken as a whole.

Mr. Henry Hartley (No. 19) and Messrs. Gilling and Moorhouse (No. 2) divide the third premium of 100*l.* The latter shows a "piazza" (?) with enclosed ends, put to no other purpose than for shelter and giving access to an entrance-hall, thence to an inner hall and a long, narrow exchange. The parts in use by the members of the Association are well arranged, but the post office is surely larger than necessary. The board-room looks like an imposing chamber on the plan but a height of 12 ft. indicated on the section destroys all hopes of this. The main front is not unlike the selected design, and, indeed, the whole scheme has considerable merit.

By a coincidence No. 19 shows his intentions on nineteen strainers, representing a great amount of labour. The outward effects are decidedly heavy, in spite of the numerous planes and other disturbing elements. The front would gain much by the fact of the main cornice having but one-third of the returns shown; the side elevation is much more effective. The author has arranged a central tower. The plans do not suggest that the upper part of the front is set back, but in other respects they possess merit.

Messrs. Willink and Thicknesse (No. 8) send eighteen strainers to illustrate their ideas, which consist chiefly of an ambitious treatment of the Exchange, entrance-hall and approaches which extend to the full length of the site. This arrangement produces a very dignified interior, but its wastefulness is a factor precluding this design from serious consideration. The upper floors consist of four lateral blocks of offices connected by a central corridor; this and other points in the scheme are fresh and original.

In No. 17 Mr. Milligan provides a kind of quadrant in the low building from which three entrances are obtained, and although passages

and doorways are cramped the ground floor arrangements are good. The author places the *café* on the first floor, and the board and secretary's rooms on the second floor. The Exchange is unnecessarily high; side light is obtained at the second floor level, but what is shown is quite insufficient. The perspective sketch rendered in outline suggests dignity.

A heavy Corinthian order dominates the principal front of design No. 7 by Mr. R. Wynn Owen. The massing of parts is good, but the plan leaves much to be desired.

A very ornate scheme (No. 12) is submitted by Messrs. F. S. Hulme, Anderson and Crawford, such as the promoters of the Competition expressly wished to avoid. The ground plan resembles a cathedral, whilst the heating-chamber and fuel store are enormous. The attempt at blending mediaeval features, such as the "crowns" on the towers, with classic forms and details, is not to be commended.

The exterior of No. 23 is in some respects admirable, but the author, Mr. A. Gilbertson, has obtained too much small detail in the front, a south-west aspect and one not desired for the pursuit of cotton business. The plan does not possess dignity, nor, indeed, the whole design any great imagination.

Mr. W. S. Ellison's design (No. 21) suggests the river front of the Hotel Cecil; he is the only competitor making use of a large central pediment. In some respects the simplicity of the plan is good, although the entrances to the exchange lack importance. The board-room is poorly treated.

By congesting his offices Mr. W. W. Kenworthy (No. 14) has produced the lowest elevation of the whole series. The design of the fronts is worthy of better draughtsmanship.

No. 9 is by Messrs. Stones, Stones and Sproat, who show a divided Exchange with a poor entrance. The design is much over-wrought; the sculpture and carvings generally make the design commonplace. The dormers in the main parapet rob the scheme of its saving clause.

In No. 13 Mr. T. T. Rees provides an open porch in place of a low building. The grouping is good and the general effect quite dignified. The planning is not good, however, particularly so where so many floors of offices overhang the Exchange.

Messrs. Morter, Dobie and G. Fraser are the authors of design No. 16, the view of which suggests a large open site. The grouping is happy and the plain walling welcome after going through seas of detail. The side-entrance through the low front building lacks importance, and the defect is even more noticeable on plan. The office blocks are too closely placed.

No. 8 is by Messrs. Haigh and Thompson, and is much too original, both in plan and elevation, to receive serious consideration in an award of this nature. There is a good feeling of space in the Exchange, but the *café* is much too extensive.

THE LAMP-STANDARDS ON WATERLOO-BRIDGE.

We have before referred to the extraordinary and ignorant action of the London County Council in destroying the fine lamp-standards on Waterloo-bridge, and substituting the commonplace things now seen there. The following letter on the subject appeared in last Monday's *Times*:—

"THE DISFIGUREMENT OF WATERLOO-BRIDGE.

TO THE EDITOR OF THE "TIMES."

Sir,—We wish to make public the following correspondence between this Society and the London County Council in respect to Waterloo-bridge:—

WATERLOO-BRIDGE.

9, Conduit-street, March 21, 1904.

Dear Sir,—This society has seen, with feelings rather stronger than those of mere regret, the alteration which has been made on Waterloo-bridge by the removal of the old lamp-standards, which were specially designed for their position and to suit the character of the bridge, and the placing of new ones which are not only of poor and commonplace design in themselves, but are in any case entirely unsuited to the style of architecture of the bridge.

We think that the County Council can hardly be aware of the solemnity that has been committed in their name. Waterloo-bridge has long been regarded as one of the finest structures of its kind in the world. Canova, the celebrated Italian sculptor, when visiting England, declared that it was worth while to have come to London if only to see Waterloo-bridge. The lamp-standards which have been destroyed were remarkable specimens of the application of art to cast-iron design; they were destined to suit the bridge both in their massive character and simplicity and in their Greek style of treatment; and there can hardly be a doubt that they were designed by Professor Cockerell, R.A., the most distinguished student

of Greek architecture of his day, and who was the brother-in-law of Rennie, the engineer of the bridge.

By the removal of these really artistic lamp-standards, and the erection of the commonplace cast-iron ones now placed there, Waterloo-bridge has for the time been entirely spoiled. The original standards were part of the design of the bridge; those which have been substituted are entirely out of keeping with it.

That the County Council did not intend such a result, and that they supposed they were acting for the best, we, of course, assume; but we do think that in dealing with a structure of such historic and architectural importance as Waterloo-bridge adequate architectural advice ought to have been taken before interfering with its design in this way; and the opinion of this society is that, at whatever cost, the original lamp-standards, or new ones on a similar design, ought to be replaced.

As we intend to send to the *Times* for publication this letter and whatever reply the Council will favour us with, we should like to ask, on behalf of the public, the following questions—

1. Did the London County Council consult any artistic authority before ordering the removal of the lamp-standards?

2. Who designed the new lamp-standards?

3. What has become of the old ones which have been removed?

I am, sir, yours faithfully,

H. H. STATHAM, Esq., F. R. I. B. A., Hon. Sec. Architectural Vigilance Committee.

To the Clerk of the London County Council.

County-hall, Spring-gardens, S.W., April 19, 1904.

Dear Sir,—The Council has had under consideration your letters of the 21st ult. and the 16th inst. with regard to the lamp-standards on Waterloo-bridge, and I am to state that the Council is very pleased to receive the views of the Architectural Vigilance Society upon this subject, as the Council observes with much satisfaction that the society is taking an interest in this and similar matters to which the Council, in the interests of London, has thought it right to devote considerable attention.

With reference to the lamp-standards on Waterloo-bridge, I may state that in 1897, when it was decided to light alternate lamps on the bridge by electricity, the question of using the existing standards was considered. These, although suitable for gas, were too low to properly diffuse the rays of electric light, and it was feared that

danger to the public might be caused through horses becoming frightened by the glare unless the standards were raised. As this could not be done satisfactorily in the case of the then existing standards the provision of new ones seemed inevitable. The choice of a design was a matter of considerable difficulty, as it was limited by the fact that only a narrow base could be fixed on the parapet of the bridge, and finally the present design was approved by the Council in 1898. When the Council at a later date approved of the proposal to substitute electric light for the alternate gas lamps which were retained in 1897, standards of the same design as those which had been already fixed for the electric light were obtained, and these have just been placed in position.

In the course of removal the old standards were unfortunately much broken, and the Council has to state its regret that the old standards have not been preserved.

The Council trusts that the facts above stated give the information desired by the Architectural Vigilance Society.

I am, dear Sir, yours faithfully,

G. L. GOMME, Clerk of the Council.

H. H. Statham, Esq., F. R. I. B. A., Honorary Secretary, The Architectural Vigilance Society, 9, Conduit-street, W.

It will be seen that our first and most important question remains unanswered, and we may therefore conclude that no artistic authority was consulted in the matter. That is to say, that the County Council have destroyed lamp-standards which were remarkable examples of artistic iron-work, designed especially to suit the character of the bridge, and have replaced them with commonplace lamp-standards of no artistic character, and by which one of the finest structures in London is disfigured.

If such a thing were done in Paris there would be a public outcry on the subject, and it certainly ought not to pass without protest in London.

Admitting that there is something in the practical objection to the old lamp-standards for electric lighting, the proper course would have been to have had new ones designed by a competent artist, in a similar style, but of higher

proportions. We ask that this should now be done, and that the lamp-standards which now disfigure Waterloo-bridge should be removed. The cost is hardly worth consideration in comparison with the object of preserving intact the architectural character of such a structure.

The design of the lamp-standards that have been destroyed can be found in Shaw's "Examples of Ornamental Metal Work."

We are, Sir, yours faithfully,

WINDSOR (Chairman)

BALCARRES

J. STIRLING-

MAXWELL

THOMAS BROCK

G. A. FRAMPTON

ASTON WEBB

J. BELCHER

W. D. CAROE

BERESFORD PITE

H. T. HARE

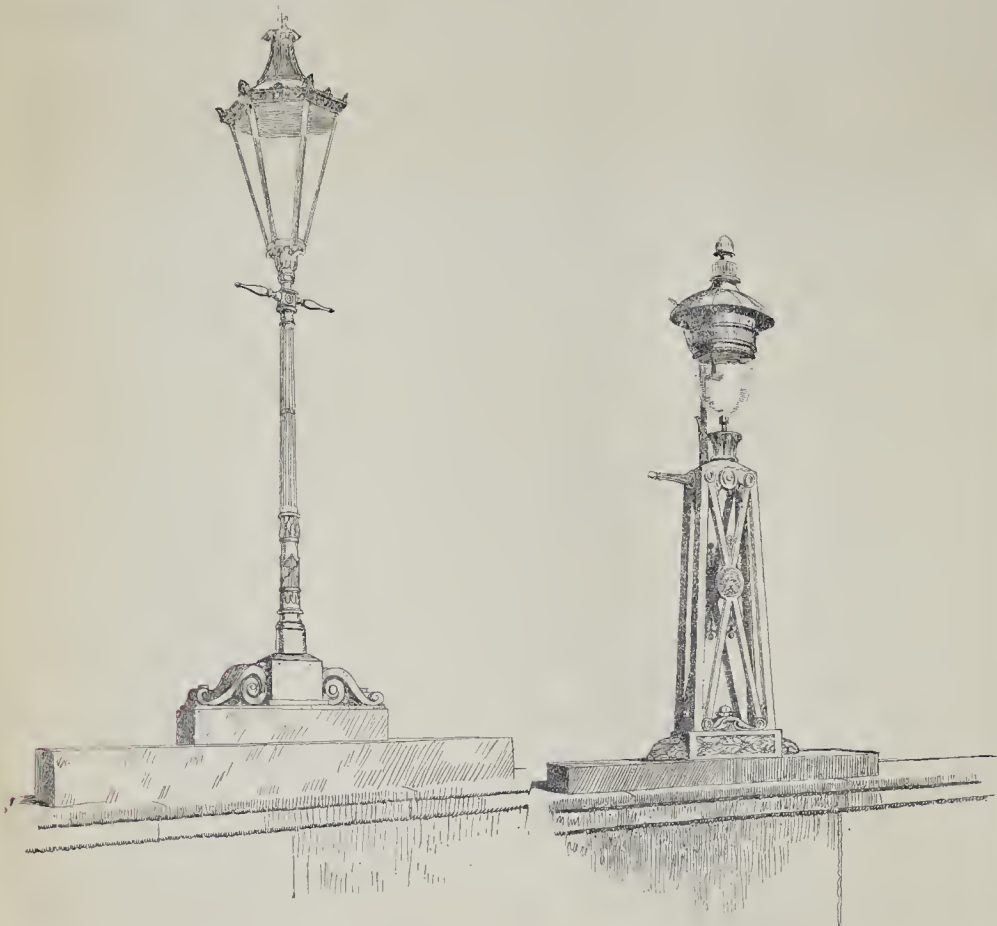
M. H. SPIELMANN

H. H. STATHAM (Hon. Secretary)

The Architectural Vigilance Society, 9, Conduit-street, June 25."

We reprint the letter mainly because we are able here to give illustrations of the two lamp-standards, the old and the new. The two comparative perspective sketches were made specially by Mr. W. Curtis Green, that of the new lamp taken on the spot, that of the original one put into perspective from the geometrical drawings in Shaw's "Examples of Ornamental Metal Work." We also give an illustration photographed from one of the new lamp-standards, from which it will be seen that it is really rather dattered in the drawing, and looks considerably worse in the photograph.

It is to be hoped that something will now be done about it, and also that the criticism of the County Council's action in this matter may induce them to consider these things a little more seriously in future, and not to meddle with ancient artistic work without taking



Lamp-standards recently erected by the London County Council.

Original lamp-standards, now removed.

The New and the Old Lamp-standards, Waterloo-bridge.



New Lamp-standard, Waterloo bridge. From a Photograph.

proper advice. We may add that the County Council agreed on Tuesday to a motion by Sir William Richmond to consider the possibility of reinstating the original lamp-standards.

INTERNATIONAL COLLIERY EXHIBITION, ROYAL AGRICULTURAL HALL, ISLINGTON.

In this exhibition, which remains open until Saturday this week, there is comparatively little of interest to the architect and building contractor, most of the exhibits being specially arranged for the benefit of those concerned in coal mining. Nevertheless, a considerable number of the exhibitors show materials, appliances, and machinery such as are in everyday use by our readers. We give in the following notes some account of the objects which more particularly struck our attention during the course of a recent visit to the Agricultural Hall.

As might be expected, materials of construction are very little represented. Beyond a few samples of rolled steel sections, the only exhibit of this class is to be found in a tank, 70 ft. long by 18 ft. wide by 2 ft. 6 in. deep, lined with Callender's bitumen sheeting, and exemplifying the suitability of this material for lining brick or concrete storage tanks and reservoirs. This tank also shows a useful method of securing an inside brick reservoir lining to the main wall, by means of specially designed wall ties. Drawing, surveying, and kindred instruments of various types are shown by two firms. On the stand of Messrs. Joseph Casartelli and Son, of Manchester, we observed an excellent collection, including levels, clinometers, theodolites, prismatic compasses, mining dials, anemometers, and drawing instruments. Similar appliances are exhibited by Messrs. John Davis and Sons, of Derby, together with a device, apparently of American origin, termed a "universal drafting machine," and intended to facilitate the operation of producing mechanical drawings. Rock drills are exhibited by several firms, and among the more prominent

of such tools may be mentioned the Rand rock drill, of Messrs. Fraser and Chalmers, specially designed for shaft sinking and quarry work; five types of the Ingersoll-Sergeant drill suitable for drilling holes from 5 ft. to 20 ft.; examples of the "Champion" rock drill, by the Champion Rock Borer and Air Compressor Co.; and a selection of hand and power rock drills, made by the Hardy Patent Pick Co. One of these drills, driven by air, and termed the "Daw," is capable of boring with ease the hardest known rocks. It will start in any position of stroke, and speed can be regulated from a few blows per minute up to the maximum number without reducing the force of the blow or interfering with the air supply cock. The stand of the last-mentioned firm also includes a variety of picks, shovels, and screens.

Conveyors of several types are to be found in various parts of the exhibition. At the stand of Ropeways, Ltd., is shown apparatus in connexion with Roe's system of aerial transport, for conveying coal, clay, lime stone, bricks, and ores, in quantities ranging from 20 tons to 1,000 tons daily. Messrs. Fraser and Chalmers have a Robins belt exhibit containing samples of the helting used in their conveyors; Messrs. Gibbons Bros., of Manchester, show examples of various forms of conveyor; and Mr. G. F. Zimmer has at work one of his patent swinging conveyors, also made with a perforated bottom for screening. The construction of this apparatus is very simple, the small number of bearings and the absence of travelling gear being special features. The maker states that a conveyor of this type, which has been at work for four years in a Welsh road metal quarry, has conveyed and screened 150,000 tons of rock, and that the cost of repairs has not exceeded 15s.

Some admirable weighing machines are exhibited by Messrs. W. and T. Avery, of Birmingham, a very convenient machine being one with a capacity of 10 cwt., having Avery's patent recording steelyard for printing the weight on tickets, thus obviating the possibility of errors in reading. Similar recording

apparatus is applied to the larger examples of weighbridges made by this firm. Messrs. Wallach Bros., of London, show their "ever-trusty" machines for lime and whitewashing, distemping or cleaning wall surfaces. These are also suitable for fire extinguishing purposes or for applying antiseptic solutions to timber partitions and walls.

Steam-propelled vans, suitable for contractors and others, are represented by a 4-ton wagon, shown by the Thornycroft Steam Wagon Co., of London, and a 5-ton wagon by Messrs. Savage Bros., of King's Lynn, both of these being strong and serviceable vehicles.

Turning now to steam generating plant and auxiliary appliances, we find a number of old friends among the exhibits. Makers of water-tube boilers are represented by Messrs. Babcock and Wilcox, and the Stirling Boiler Co., the former firm exhibiting the model of a water-tube boiler, fitted with steam superheater, and the latter three working models, one with glass tubes showing the circulation of water during the generation of steam, as well as a boiler supplying steam for the requirements of the exhibition. Messrs. Cochran and Co., of Annan, exhibit one of their patent vertical multitubular boilers, the special feature of which is that it is easily accessible for internal cleaning. At the stand of "Circulators, Ltd.," may be seen a model of the "Schofield" patent water circulator for application to Lancashire and Cornish boilers. This model is shown fitted in a model boiler heated by a gas jet, and is clearly calculated to improve longitudinal circulation, and thereby to equalise expansion and assist the operation of steam raising. Mechanical stokers are exhibited by Messrs. Babcock and Wilcox, Eith's Engineering Co., Meldrum Bros., James Proctor, and "Triumph Stoker, Ltd." Most of these stokers are so well-known as to need no description, but it may be remarked that the last-mentioned is fitted with an ingenious device for throwing the coal in small quantities at intervals of a few seconds over the surface of the fire, each deposit being

on an area different from the preceding one. This feature is distinctly worthy of consideration, as its effect should be increased efficiency and diminution of black smoke. Fuel economisers are not much in evidence, the only exhibit being a model of the Green economiser with which our readers are already sufficiently familiar.

Messrs. James Simpson and Co. have on view a useful series of samples, including a Webster vacuum feed-water heater and purifier, with oil filter and separator, a superheater section, and Webster steam and oil separators. Messrs. Joseph Wright and Co. exhibit a model of the improved Berryman feed-water heater, and Mr. William Boby an example of the Chevalet-Boby heater-detartariser for heating and softening water for boiler feeding and other purposes.

Several types of water softener will be found at the exhibition, among which we may mention the Brunn Loewener softener, by Messrs. Lassen and Hjort, of Greenwich, the Koppel softener by Mr. Arthur Koppel, of London, and the Oscar Guttman softener (model only), by Messrs. Babcock and Wilcox. A very fine collection of boiler mountings, steam valves, safety valves, and other steam specialties, has been got together by Messrs. J. Hopkinson and Co., of Huddersfield. This exhibit occupies a central position in the hall and thoroughly deserves careful inspection by all steam users.

At a colliery exhibition it is only natural that pumps should be strongly in evidence, and in the present instance, although no pumping plant of any great capacity is shown, the exhibits are distinctly interesting. Messrs. Ernest Scott and Mountain, of Newcastle, show a three-throw motor-driven pump, capable of delivering 50 gallons per minute against a head of 800 ft. The Worthington Pump Co. have on view some small boiler feed pumps, a three-stage centrifugal turbine high lift pump connected to a Westinghouse motor, and a small triplex power pump. Messrs. Gwynnes have a series of eight small centrifugal pumps, two being direct coupled to oil motors, one to a steam engine, and another to an electric motor.

The Pulsometer Engineering Co., of Reading, have a varied exhibition of their specialties, including a small pulsometer fixed in a section of a wall, showing the method of slinging and working; a "Deane" vertical sinking pump, 1904 pattern; a centrifugal pump, which swivels to any required angle; and a model air-lift pump for tube wells. Messrs. Joseph Evans and Sons, of Wolverhampton, offer visitors the opportunity of inspecting a large

assortment of steam and other pumps for various services. Among the types shown on this space are "Cornish" steam pumps of the bucket type, for general and sinking purposes, single and double ram pumps for boiler feeding, as well as treble ram, siphon, and centrifugal pumps of different types and sizes.

Perhaps the most remarkable feature of the exhibition is the evidence presented in the stands of several well-known firms of the great advances made in the electrical driving of machinery. Space will not permit us to deal in detail with the numerous examples of electrical apparatus which we had an opportunity of inspecting on the occasion of our visit, and we must content ourselves with a brief mention of the most noteworthy exhibits. Messrs. Bruce, Peebles and Co., of Edinburgh, show a 240 h.p. three-phase 3,000 volt induction motor, and electrical machinery of various kinds; the British Westinghouse Co. have a large space, in which are exhibited numerous examples from the complete range of electrical apparatus they have worked out for driving, winding, hauling, pumping, coal-cutting, hoisting, and other machinery; Messrs. Ernest Scott and Mountain exhibit a comprehensive selection of electrical apparatus, including generators, motors, starting and reversing switches, and other machinery; the General Electric Co. devote a considerable amount of space to the display of generating and hauling machinery, and of lamps, telephones, and electrical accessories. Among other exhibitors in this department of work are Messrs. Witting, Eboral and Co., F. A. Glover and Co., Mavor and Conson, Reavell and Co., T. Rowbottom and Co., while electrical cables are exhibited in great variety by Messrs. W. T. Glover and Co., Callender's Cable and Construction Co., and the St. Helen's Cable Co.

The present exhibition is not so extensive as some others that are held annually in the Agricultural Hall, and, appealing to a somewhat restricted section of the community, it is not crowded with members of the general public. We have shown in the foregoing notes that the exhibition contains ample material to interest many of our readers, and the absence of mere sightseers is an advantageous feature from the point of view of those who desire to obtain useful information in peace and comfort.

RESTORATION OF PARISH CHURCH, BURTON.—The restoration of Burton Parish Church has now been completed. The work has been carried out, at a cost of 14,000*l.*, under the superintendence of the architect, Mr. Beck.

MONUMENT TO THE LATE DEAN OF PETERBOROUGH.

A MONUMENT to the memory of the late Dr. William Clavell Ingram, Dean of Peterborough, was on Saturday, May 28, dedicated by the Bishop of Peterborough in the presence of a large congregation. It is an altar tomb with a recumbent figure in white Carrara marble of the late Dean. The base is from a design by Mr. Bodley, executed by Messrs. Thompson and Sons, of Peterborough. The figure is by Mr. Walter Rowland Ingram, the Dean's brother, who unhappily did not live to complete it, and it was finished by two of his former assistants, who had worked under him for many years.

The monument is set up in the Eastern Chapel or Ambulatory of the cathedral. The repair of the West Front of the cathedral, which had been carried on during his life, and which was an object to him of the deepest interest, was completed after his death as a memorial to the late Dean. The monument now dedicated is a personal tribute to his memory by many of his intimate friends.

NEW CLOCK, NELSON, LANCS.—A large tower clock, with four 7-ft. dials, chiming the "Westminster" quarters on four bells, and striking the hours upon a ton bell, has been placed on the Market Hall, Nelson, and was formally started on the 18th ult. The work was carried out by Messrs. John Smith and Sons, Midland Clock Works, Derby; the clock being generally to the designs of Lord Grimthorpe, and fitted with all the latest improvements.

CARPENTERS' COMPANY.—At the examination in carpentry, held at Carpenters' Hall from the 15th to the 18th ult., fifty-seven candidates presented themselves, the largest number hitherto recorded. The proportion of candidates who came up from the provinces was larger than in previous years. The following is the list of successful candidates:—Silver medal—J. H. McCurdy. Bronze medal—J. G. Foxcraft. First-class Certificates—W. A. Scott, W. Birrell, J. T. Pridmore, F. Lambert, J. G. Hurst, W. F. Grove, E. Sudds, W. E. Barnes, W. F. Lombard, O. Gentle, J. Finch, W. Cox. Second-class Certificates—W. T. Brown, F. Boxall, A. L. Carter, G. R. Shrimpton, W. T. W. Smith, J. W. H. Chubb, C. S. Hill, W. E. Sheppard, J. B. Sherbrooke, J. D. McLeod, W. J. Wheeler, G. F. Goodwin, E. Keridge, E. Prieckett, W. Ambrose, P. J. Luxton, E. Elms, C. H. Hancock, G. Swinerton, F. G. Shott, E. Dymock, A. H. Ridd, J. G. Harris, H. Cottingham, C. Stanton.



Monument to the late Dean Ingram, Peterborough Cathedral. The late Mr. Walter R. Ingram, Sculptor: Mr. G. F. Bodley, R.A., Architect.

TRAFALGAR-SQUARE; WEST STRAND (NORTH SIDE) AND AROUND ST. MARTIN'S CHURCH; LEICESTER-SQUARE; AND LOCAL IMPROVEMENTS IN ST. MARTIN-IN-THE-FIELDS, ST. ANNE, SOHO, AND ST. GILES-IN-THE-FIELDS PARISHES: 1801-1900.

On January 2 last we described the making of Regent-street, Waterloo-place, and Pall Mall East in pursuance of the Act of 1813 (53 Geo. III, c. 121). The preamble, moreover, sets forth that:—

"It would be of great Accommodation to the Public . . . if Provisions were made for widening the East End of Pall Mall, and for continuing the same Eastwards by a new Street into Saint Martin's Lane, terminating at the Portico of Saint Martin's Church; and for widening Cockspur Street from the South End of the Haymarket to Charing Cross; and for forming an open Square in the King's Mews opposite Charing Cross. . . ."

The powers thereby granted to the Commissioners of H.M.'s Woods, Forests, and Land Revenues were resumed and enlarged by an

Act of 1826 (7 Geo. IV., c. 77), which recites that:—

"It would be a great Accommodation to the Public . . . if the Commissioners . . . were authorised to make . . . a new Street, so as to continue Pall Mall East from the King's Mews to Saint Martin's Church and from thence in a South-easterly Direction on the South side of the said Church to the North side of the Strand, and to form an open Place or Square opposite Charing Cross, by widening the Communication between Cockspur Street and Craven Street, and to widen the Strand on the North side thereof as far as Castle Court, and also Saint Martin's Lane South of Hemming's Row and Chandos Street, and to improve and widen the South side of Chandos Street. . . ."

The later Act provides for the taking of what might be required of the south part of St. Martin-in-the-Fields churchyard; the removal of the workhouse, parochial School, the Tenison Library, and the Free School in St. Martin's-lane and Hemming's-row, the watch-house, vestry-room, etc. The watch-house and parish stocks stood opposite the

middle of the church portico, the vestry-room on the south of the church (Fig. 1).

The Mews.—After the destruction by fire in 1534 of the King's Mews at Bloomsbury, the Mews at Charing-cross, where the King's hawks and falcons had been kept, were rebuilt in the reigns of Edward VI. and Mary I. for the royal stud and equipages, which were transferred to the Royal Mews at Piccadilly in 1824. The entire group comprised the Earl of Leicester's Green Mews to the north; the Crown or King's, also called Upper, Mews in the middle—where is the west wing of the National Gallery (Fig. 2)—the Great Mews to the south facing Charing Cross; and the Back Mews to the west. The last-named are plotted as Dughill Mews in Thomas Chawner's large-scale survey of July 15, 1796, as lying next south of Monmouth-court, and used by the Duke of Clarence. The group (Fig. 1) occupied the area bounded by Orange-street, Hedge-lane (Whitcomb-street), Cockspur-street, Charing Cross, and the lower portion of St. Martin's-lane; the "colours" of the several stables gave names to Blue Cross, Green, and Orange

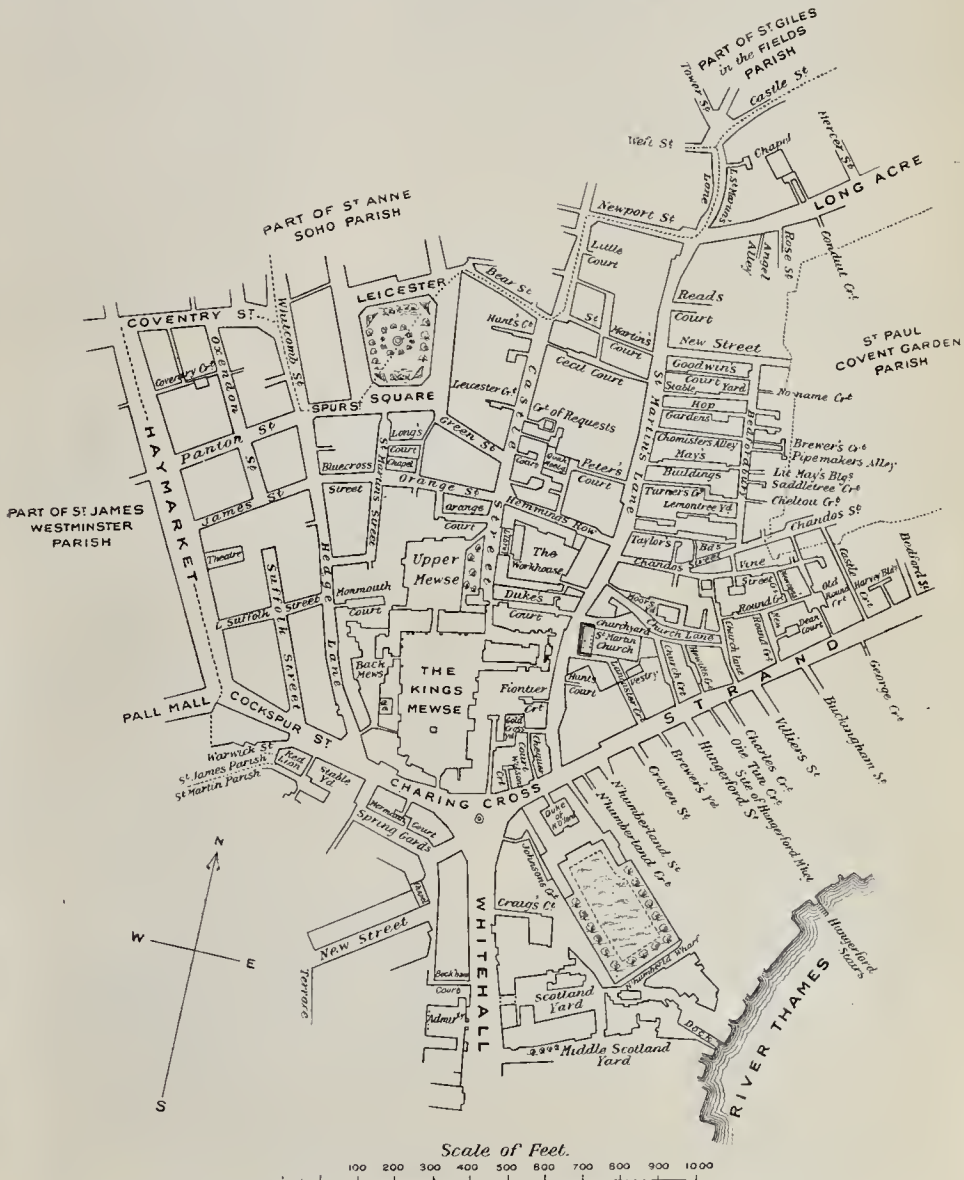


Fig. 1. Plan of the Parish of St. Martin-in-the-Fields, from a Survey made by E. Waters in 1799.

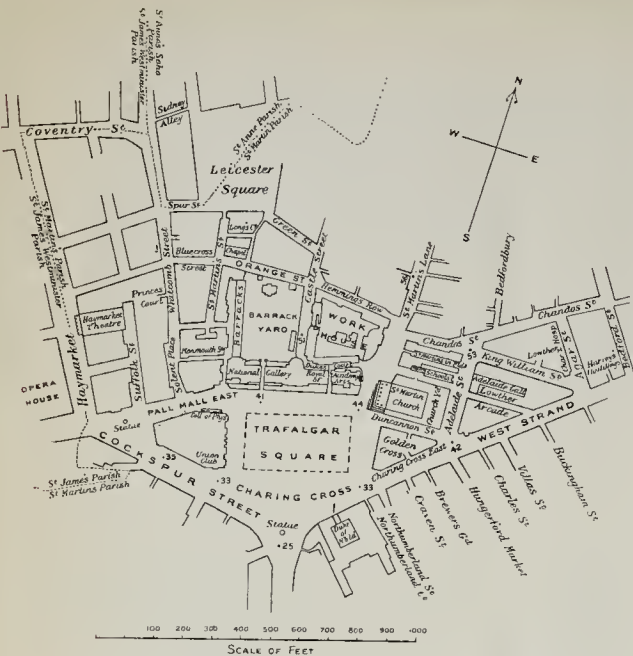


Fig. 2. Waters's Survey of 1799 corrected to 1840 by James Wyld.

streets. One block consisted of a building of red brick with stone dressings, after the Tudor style, having buttresses and crenelles, which, until its demolition in 1830-1, served for soldiers' barracks. The transverse block, standing east and west, sometimes misnamed the riding-school, measured 271 ft. by 53 ft., and had a middle gateway opening into the Green Mews. It formed the stabling of the state horses; the adjacent block, south-east, was the riding-school. That range of stabling was subsequently used as a storehouse for public records and, after the demolition in 1829 of (Old) Exeter Change, Strand, for Cross's Menagerie. At the clearance of the site the National Repository, somewhat similar to the Conservatoire des Arts et Métiers at Paris, was taken from the King's Mews to No. 28, Leicester-square, T. Hosmer Shepherd's drawing, in St. Martin's-lane Free Library, shows the south front inscribed "Menagerie" and "National Repository Exhibition." Whilst some credit the work to Kent it is generally understood that Lord Burlington re-arranged the King's Mews in 1732 for George II., and designed the south front of the state horses' stables cited above, which is depicted in *Wale's* print of about 1750 [January 17, 1903, "stables on the National Gallery site" *], and in *T. Malton's* print of December 30, 1794. Duke's-court lay east and west between the Crown Mews and St. Martin's-lane, opening out of the latter nearly opposite the church. Chawner's plan of 1796 plots the many taverns, houses, and other tenements scattered about the Mews, with the courts, etc.; the Golden Cross coaching inn, No. 10, lay 71 ft. due north from Charles I.'s statue; opposite the opening into Spring-gardens stood the classic front of the Phoenix Fire Office's engine-houses, 1787, by Thomas Leverton (*obit* 1824), of which there is a print in *Malton's* "London," 1792; confer also in the Craze Collection C. Ingre's plans of the properties sold on March 1 and June 25, 1830.

Trafalgar-square.—A map printed by order of the House of Commons of May 12, 1826, shows that during the erection in 1822-8 of the block on the west side of the square it was proposed to take the Mews site for a "Parthenon" to receive the Royal Academy, the Royal Society, and the Society of Antiquaries, and an "Athenaeum" (*sic*) on the ground where is now Morley's Hotel. In the result Sir Charles Barry laid out the square,

* Dates in squared brackets relate to illustrations in the *Builder*.

albeit upon a scale less grandiose than that of his initial conception. The *Gentleman's Magazine* records that the work was begun on August 14, 1837, with the making of the wide footpath along the north side. Barry adjusted the level of the inner space to the incline of the ground with a retaining wall, 255 ft. long, and two flights of steps. He designed the lamp-standards for Bude-lights, the granite posts, basins, and fountains (1844). For the fountains, constructed of Peterhead granite by McDonald and Leslie, of Aberdeen, he obtained a supply from two artesian wells sunk in Orange-street (300 ft. deep) and in front of the National Gallery (395 ft. deep), joined at the depth of 170 ft. by a tunnel to contain 70,000 gallons of water—the wells and tunnels holding when at rest about 120,000 gallons; Easton and Amos made the two engines for the works in Orange-street, the supply being also forced to the public offices in Whitehall and to the Houses of Parliament. The east side of the square, comprising Morley's Hotel, was designed and built upon his own land by George Ledwall Taylor, who died aged 93, in April, 1873. Along the north retaining wall are standards of lineal measures at 62° F., ranging from 1 in. to 100 ft., including the pole or perch, and the surveyor's land-chain, which perhaps may become historical before many years elapse. They were made of gun-metal by Troughton and Simms in 1876, for the Board of Trade, under the superintendence of the late Sir George B. Airy, Astronomer Royal, and are periodically verified by the Standards Department.

The National Gallery, begun in 1832, was opened on April 9, 1838. The pictures, about 150 in all, were hung in five upper rooms in the west wing, the east wing being allotted to the Royal Academy; the ground-floor, at first intended for a public-record depository, was taken for official apartments. Wilkins was hampered by a limited space; he was required moreover to preserve the view of the church and to leave a passage-way (since closed) into Duke's-court, with two entrances to the ground at the rear where are now the remaining portions of St. George's Barracks. He used stones from the King's Mews and the columns, but not the architrave, of the carriage-porico of Carlton House. The cost, 96,000*l.*, amounted to nearly twice the estimated expenditure. Wilkins's building [October 24, 1891, elevation] contains the rooms numbered xvii.—xxii. in the west wing, and xii.—xiv., xvi., and xviii., in the east wing. Pennethorne's altera-

tions of 1890-9 involved the destruction of the noble staircase, an original and impressive piece of design, having a spacious dignity and mystery akin to what we see in some of the staircases of the Louvre, but very rarely in our own public edifices. Though the judges did not select any of the designs submitted for a new building, they named as the best those of E. M. Barry [May 25, 1867, with plan of the principal floor], at an estimated cost of 480,000*l.* The work, but in a much modified form, was entrusted in 1868 to Barry (*obit* 1880), because, it is understood, he and Street could not cooperate in building the Royal Courts of Justice, for which his plans and Street's designs respectively were considered to be the best. Barry's additions on the north and east [July 29, 1876, two plans, and the octagonal hall with its four vestibules] comprise rooms Nos. ix., x., vii. (the long gallery), and around the Octagon, iv., viii., xi., and xv. G. W. Booth was the contractor; Messrs. Craze executed the decorative work; Wyon modelled the sculptured reliefs in the semi-circular panels of the end wall of each of the four vestibules. In 1860 the Royal Academy migrated to Burlington House. The rooms i., ii., iii., v., and vi., and the north, east, and west vestibules, were added in 1885-7 by Sir John Taylor, of the Office of Works, who replaced Pennethorne's double-staircase with the present one, decorated by Messrs. Craze and Son, who used various coloured marbles from Algeria, Modena, Prato, and Tuni.

In 1880 Mr. W. H. Alexander gave 80,000*l.* for a National Portrait Gallery. The Government voted 16,000*l.* for the east building, and paid the London County Council 7,000*l.* for some land abutting on Hemming's-row, throwing 900 sq. ft. into Charing Cross-road, and added 575 sq. ft. of Crown land to that road in 1889. Ewan Christian died in February, 1895, a few months before the completion of the building. [January 4, 1896, Mr. W. Monk's drawing; with plan, section, and twelve of the busts.] Messrs. Shillitoe and Son were the general contractors; the portrait busts over the first-floor windows and elsewhere are by Mr. F. Thomas.

West Strand.—For the re-building of Charing Cross East and West Strand on the north side were pulled down all the houses Nos. 431-487, between Castle-court (Agar-street) and (old) St. Martin's-lane, together with the courts and alleys plotted on the two plans (Figs. 1 and 2), and C. Ingre's plans already cited. At the corner of Agar-street is No. 429, built in 1832 for the Westminster Insurance Company, after C. R. Cockerell's design, and since tenanted by the notorious (old) Royal British Bank. In 1886-7 Messrs. Arding, Bond, and Buzzard re-constructed the whole interior for the British Medical Association and the *British Medical Journal*. In 1890-2 the Lowther Arcade, which the younger generation will remember for its toy-show, was built across the triangular block by Witherden Young, the architect also, for Jacob Perkins, of the adjoining Adelaide Gallery. The Arcade, recently displaced by Coutts and Co.'s new bank, had a passage 245 ft. by 20 ft., and 35 ft. high, and, lighted by small domes on pendentives, presented a very pleasing effect—see W. Herbert's drawings of 1830. The Adelaide Gallery, converted in 1852 to the Marionette Theatre, was again altered in 1894 by Mr. W. B. Pinhey, and added to A. and S. Gatti's restaurant. In 1848 the Fathers of the London Oratory of St. Philip Neri rented two houses on the northern side of King William-street, and adapted the Lowther Rooms (Wyld's map, Fig. 2) for their chapel. After their removal in 1851 to Brompton the Polygraphic Hall, No. 24, was built on the site for Woodin's "Olio of Oddities," by James Thomson (*obit* 1883) whose son, John J. Thomson, rebuilt the Hall in 1883 for Mr. J. L. Toole, as the Charing Cross Theatre, since the Folly, and Toole's, 1890-5, where the revived Society of Beefeaters had their domicile. The theatre, having been pulled down in September, 1896, the governors of Charing Cross Hospital bought from the Commissioners the freehold of the site, with Nos. 23-7 in the street, and Nos. 15-16, Chandos-street, for extensive additions to the hospital. Mr. A. Saxon Snell's designs were chosen in a limited competition in March, 1899, and the ground was finally cleared in the following autumn [June 21, 1893]. Dr. B. Golding established the hospital and a dispensary as an extension of the local West London Infirmary, founded in 1818; when built in 1831-3 by Burton it was only the

eight institution after that kind in London (see illustration). The governors acquired the freehold in 1850; twenty years afterwards James Thomson added a story, and re-modelled the interior; his son carried out similar alterations of the now adjoining Royal Westminster Ophthalmic Hospital, founded in 1817 by G. F. Guthrie, in Warwick-street, Golden-square. In West Strand the Golden Cross Hotel (1832) is by Sir Wm. Tite (*obit* 1873), the ground floor front is changed; No. 457 was the shop of James Wylde, geographer and map-seller; Jeffrey, geographer to George III., kept his shop at No. 487; Nos. 453-6 was the oil and lamp shop (1752) of the late Mr. Gardner, who gathered so remarkable a collection of views, prints, maps, etc., of London in the past.

St. Martin's Church and around.—Under the Act of 1826 the churchyard was enlarged on the north and east sides, the south part, known as the (Thames) Watermen's burial-ground, being taken for Duncannon-court. Around the church were many courts, passages, and alleys, together with the purlieu known as Porridge Island, famed for its cook-shops, the Straits of the Strand, the Bermudas, and the Carrihee, corrupted by the inhabitants into Cribbee, Islands (Fig. 1). W. C. Mylne acted as valuer on behalf of the Woods and Forests; the new names commemorate three Chief Commissioners—Viscount Lowther, G. J. Welbore Agar Ellis, and Viscount Duncannon. The lower portion of St. Martin's-lane was added to Trafalgar-square. Burton widened and rebuilt the middle portion as St. Martin's-place, and laid out the triangular hock bounded by the Strand, Adelaide-street and King William-street. Nos. 4 and 5, St. Martin's-place were required under the National Gallery Improvement Act. George IV. had given the site of No. 4, built in 1830-1, to the Royal Society of Literature; the Provident Institute and Savings' Bank (1816) removed in 1830 from Leicester-place, Leicester-square, to No. 5, and thence to the premises—now Parr's Bank—erected on the site of Palmer's glass-house after David Brandon's designs [May 22, 1875],

where they remained until the transfer in January, 1896, of the accounts to the Post Office Savings' Bank (Fig. 2).

St. Martin's Church.—The spire, struck by lightning in July, 1842, was reinstated to an extent of 45 ft. In 1858 T. Hayter Lewis decorated the interior and lowered the pews, which had been designed to range with the pedestals of the columns. [October 23, 1858; interior, showing the alterations.] In 1893-7 Sir Arthur Blomfield and Sons repaired all the external masonry, dressing it with "quartz," and redecorated the interior. Prints by West and Toms, and others, of 1726-38 show the graveyard as an open space, with posts, on the south side of the church. The graveyard and the vaults were reconstructed within a retaining wall on the south and east in 1828-9 (the railings being by Cottam and Co.), and for a while the vaults were open for visitors; confer the *Mirror* of December 26, 1831. Either at that time for a readjustment of the new levels, or previously,* a lower course of steps was added on the west side, merging into the higher ground northwards, with a horizontal landing or platform between the two flights, so as to preserve the effect of the portico as standing upon a horizontal base. In 1887 the late Metropolitan Board of Works proposed to alter the steps for a widening of the footpath, and made a model of their scheme; Butterfield proposed to mutilate the portico itself by removing the front row of columns. After a lapse of ten years the Vestry unsuccessfully asked the London County Council to undertake the work as a county improvement. Despite the expressed opinion of the Institute whom the London County Council consulted, the City of Westminster began the work in the autumn of 1900. They added about 3 ft. to the footpath by cutting away the steps, and increased the gradient-rate of the new thirteen s.s.p. on the west by oblitterating the platform

after considerable pains, we had to determine this point; of the very numerous drawings and views for the period 1726-1819, the more authoritative give conflicting evidence.

on that side; for a compromise they retained, but reduced, the platform on the south side. Thus they dispelled a skilfully-gained effect, and destroyed the symmetrical range of seven unbroken steps rising from a horizontal landing to the colonnade of the portico, with the platform itself on the west side, which had separated from the design the lower flight meeting the incline. The recent isolation of the National Gallery on the west side and the gradual demolition of the barracks, suggest that it might have been better in the beginning to make an approach from the north, into the square, on that side by an avenue or boulevard incorporating Leicester-square.

In 1886-91 the Board of Works cleared away Hemming's-row, Peter's-court and the parish-room, formerly the Quakers' Meeting House, in the court, the parish workhouse and the Admiralty pattern-rooms on the south side of the row, and the lower end of Castle-street, for the south end of Charing Cross-road. In 1890-5 they widened Green-street, on the north side, and pulled down Nos. 31, 33, and 34, Leicester-square (Figs. 1, 2, and 5). The clearance in Castle-street involved the schools, with library and common-room, which Archbishop Tenison, after consulting Evelyn and Wren, established in 1684-5 for the clergy and parishioners of St. Martin, St. Anne, Soho, St. James, Westminster, and St. George, Hanover-square parishes. Wren designed the library and schools erected in 1685-97 on the east side (near Duke's-court) of the lower end of Castle-street (Fig. 1). The Charity Commissioners had made an order for the sale at auction of the Tenison Library, about 4,000 volumes, in 1864; the school remained there until 1871, when the new buildings were ready in Leicester-square (*q.v.*). On the northern side of Chandos-street (1637) are the buildings of Charing Cross Hospital Medical School (1881), by the late John J. Thomson, and enlarged by him in 1889 over the site of the old Black Prince tavern on the east side of Bedford-court; a tunnel from the basement communicates with the hospital on the south side of the



Fig. 3. Parts of St. Giles-in-the-Fields, St. Martin-in-the-Fields, and St. Anne, Soho, Parishes: from Horwood's Survey of 1795-9, and Chawner and Pennethorne's Revised Plans of 1840, to show the Improvements for New Oxford-street, Endell street, etc.

street. In Bedfordbury are a Mission church and schools [November 23, 1861] by the late Sir Arthur Blomfield.

Leicester-square (1640-71) and around.—Until the extension in 1845 of Coventry-street across Princes-street (incorporated with Wardour-street in 1881), and the widening in 1844-5 of the footway, now Cranbourne-street, with an extension across Castle-street to Long-acre (Fig. 4), Leicester-square proved as well-nigh inaccessible as Lincoln's-Inn-Fields are still, the only direct approaches from the south being through Spur-street, and the narrow Green-street and Hemmings-row, formerly Dirty-lane. For that improvement, by Chawner and Pennethorne, see *infra*. In 1880-1 the late Metropolitan Board of Works widened Coventry-street, south side, from 40 ft. to 60 ft., at a gross cost of 186,326*l.*, and a net cost of 100,448*l.*, Nowell and Robson being the contractors, and widened Princes-street, renamed, 1881, Whitcomb-street, west side, between Coventry and Panton streets. Amongst the houses demolished in Coventry-street was No. 21, Wishart's snuff and tobacco shop, which David Wishart opened at the sign of the Highlander, Thistle, and Crown, on December 31, 1720, the day of Prince Charles Edward's birth; the shop was a favourite trying-place of Jacobites. A gradual rebuilding of Leicester-square, begun fifty years ago, leaves but three or four of the old houses. Messrs. Puttick and Simpson removed in or about 1840 from Piccadilly to No. 47. We have ascertained that Sir Joshua's painting-room, octagonal on plan, 16 ft. high by 20 ft. across, and lighted by one square window having its sill 9 ft. 4 in. above the floor, was taken down for a large apartment built sixty-three years ago by the Western Literary and Scientific Institution, and since adapted as an auction room. Messrs. Wimperis and East designed the new sale-room (1899), on the site of Sir Joshua's stables in the rear, and were architects for Messrs. Thurston's, of the adjoining premises, erected in 1900, on the sites of Nos. 45-6, in the square, and No. 62, Whitcomb-street [November 21, 1903]; No. 48 is by Messrs. Treadwell and Martin. Nos. 34-5, with No. 23, Green-street, and Nos. 4-5, Long's-court, were acquired at a cost of 42,000*l.* for the Dental Hospital, begun in 1900, and built by Messrs. Trollope and Sons from Messrs. Young and Hall's plans and designs, in lieu of the adjacent Nos. 39-42, whither the hospital migrated in 1874 from Soho-square. In St. Martin's-street was pulled down in 1898, Bertolini's coffee-house, No. 34, a haunt of men of letters, musicians, and actors during the earlier half of the century; in October, 1897, Macmillan's quitted Bedford-street for their new premises [December 12, 1896, and September 25, 1897] by Mr. John Cash. The Baths and Washhouses in Orange-street, by Priehard and Baly, 1848, are, we believe, the first established under the Acts of 1846-7 in that behalf, and were altered and improved by Mr. C. Mason in 1892. In Green-street the eight houses on the north side, west end, are by Mr. G. D. Martin (1896), the Star and Garter, No. 13, and the Garrick hotels by Messrs. Saville and Martin; and the Beefsteaks' Club-room at No. 9 by Mr. F. T. Verity [July 19, 1902].

In 1783 John Hunter leased No. 12, Leicester-fields (since No. 28 in the square), and No. 13, Castle-street. On the intervening space he built his museum, a large apartment lighted by three cupolas, and lecture and dissection-rooms, which, until seven years ago, had formed the workshops of a firm of musical instrument makers. The premises were pulled down in December, 1900, for a block of shops and chambers—by Mr. J. P. Crosby. No. 30, where Hogarth lived at the sign of the Golden Head, a bust of Van Dyck he made of cork (see Parr's bird's-eye view, after Maurer, 1753), and latterly the (old) Sablonière Hotel, gave way to Tenison's Grammar School, 1871, by Murrable. The inscription of the Society of Arts' tablet is somewhat misleading, for it says Hogarth "lived here." The Alhambra was built for a polytechnical exhibition as the Panopticon of Science and Art in 1850-1 [December 20, 1851], plan and drawing; March 18, 1854, interior] after designs by Professor T. Hayter Lewis (obit 1898), to whom his partner, Finden, committed the entire work; the details and decorative scheme were taken chiefly from remains at Cairo. Our drawing shows a vast dome rising to 140 ft. from the ground, as at first intended to be constructed of iron and glass on the ridge-and-furrow principle, with the

pair of minarets nearly 100 ft. high. In the altered design a dome 72 ft. in diameter, with a circular top-light 32 ft. across, and sixteen other lights, was raised above the round hall 98 ft. in diameter, resting on the top of iron columns in three rows. The *Builder* of May 7, 1853, contains Hayter Lewis's account of how he constructed the main ribs, on the ground, and arranged for their equilibrium when in position. John Willson was the builder; Grissell supplied the iron work. The organ, by W. Hill and Co., second in size, but not in power, to only that in York Minster, was removed to the south transept of St. Paul's for the services under the dome, and thence to Clifton. W. T. Best was the first organist. In 1837 the Panopticon became a circus, and then a music-hall and theatre. Twelve months after an extensive alteration of the dome, a fire destroyed the house in the night of December 6-7, 1882. In the re-building, after the late firm of Pery and Reed's designs [June 16, 1883, two interior views], only the front wall was retained, and the ground floor of the front was removed for door-ways, the superstructure being carried upon a continuous compound girder. The architects re-arranged the entire interior, replaced the rotunda with a flattened dome, and used very little wood; Professor A. B. Kennedy supplied drawings for the iron work. The additional buildings, after the Moorish style, having three entrances from Charing Cross-road (1896-7), are by Mr. W. M. Brutton. In 1634-5 Robert, second Earl of Leicester, built upon some open lammas-land a house, for a long period included in Little Newport-street, to which are due both the situation and irregular shape of the square, just as in the laying out of Russell-square its east side was set in alignment with Baltimore (1759), since Bolton, House. The Tulk family bought Leicester-fields for 90,000*l.* Of Leicester House a small portion, being then the (old) Hotel de l'Europe, survived until 1806. The hotel, rebuilt, and two shops were taken down in 1896 for the Hotel de Paris, re-named the Queen's, by Messrs. Saville and Martin. Sutton Nicholls's bird's-eye views of 1751 and 1754 depict next to the forecourt and left wing of Leicester House, a mansion of the Earls of Ailesbury, of whom Charles, succeeding as third earl in 1741, married Lady Anne Saville, daughter and co-heir of William, Marquis of Halifax. The house, afterwards occupied by Sir George Savile, Bart., was subdivided; the west portion became a linen-draper's shop; in the east portion Miss Linwood exhibited, 1804-45, her pictures in needle-work and crewel embroideries. In 1849 the premises were hired for a series of panoramas, followed by certain shows, *tableaux vivants*, and *poses plastiques*, which contributed to the reputation then enjoyed by that locality. We witnessed the fire which consumed that part of Savile House to the ground level on February 28, 1865. The basement became the Shades; the upper portion, left vacant some years was taken for the projected Denmark theatre and the equally abortive Alcazar theatre. In 1882-3 it gave place to the Pandora theatre, by T. Verity (obit 1891), which, never having been opened, was re-constructed by him and opened as the Empire Theatre on April 17, 1884. Three years afterwards Messrs. Romaine-Walker and Tanner altered the house for a "variety" theatre, opened on December 22, 1887. The later Hotel and Café de l'Europe [November 11, 1899, café and brasserie interiors], by Mr. W. Emden, at the corner of Leicester-place, covers the site of Dibdin's first Sans Souci theatre (1796) in Leicester-place. No. 16 is the Girls' School of Notre Dame de France, which should not be confused with the Boys' School at Leicester House in Lisle-street. The church of Notre Dame, entered from Nos. 5 and 6, Leicester-place, is a conversion of the interior of the Rotunda, built by Robert Mitchell, architect, for Robert Barker, inventor of a once highly popular kind of exhibition. In his patent of June 19, 1787, he describes his invention as "an entirely new contrivance or apparatus which I call La Nature à Coup d'Œil." Barker opened the Rotunda in 1794 with a picture of London, painted by Thomas Girtin from the Albion Mills, Blackfriars Bridge, and displayed on a spherical frame 85 ft. in internal diameter. Mitchell's sectional view, 1801, shows side-staircases rising to the top platform. Barker died in 1806; to his son Henry succeeded John Burford, followed in 1823, until about fifty years ago, by his son Robert, who painted many of the pictures

in oil and mostly from his own sketches; G. C. Selous was his principal artist for a period of thirty-five years. Having obtained a ten years' lease of the enclosure from the Tulk family for 3,000*l.*, James Wyld, M.P., the map-seller, erected in 1851 his Great Globe [April 5, 1851, view and plan], after designs by H. R. Abrahams, the ground floor measuring 165 ft. across. From the middle rose a shallow drum 85 ft. in diameter, carrying a dome covered with lead, and admitting daylight through the top. The model, to a scale of 0-1 in. to a mile horizontal by 1 in. to a mile vertical, was viewed from galleries gained by winding stairs. After the demolition of the Globe, in October, 1862, was exhumed the gilded equestrian statue of George I., cast in lead by, reputedly, Van Nost, and modelled by C. Büchard for the Duke of Chandos, which the residents in the square had bought in the sale at Canons in 1747. The local authorities allowed the ground to return to its pristine state of squalor and neglect, that again rendered it a standing reproach, and, as in the case of Landseer's lions at Trafalgar-square, a fruitful theme for bunter in *Punch* and other papers. The chief object of attack was the mutilated statue which at length appeared one morning painted like a toy-horse. A judgment of the Master of the Rolls in December, 1873, inhibited the freeholders from their project of building over the ground. In the following year Albert Grant, M.P., who had made a similar endeavour in respect of Soho-square on the Duke of Portland's estate, acquired the land for, it is said, 30,000*l.*, and employed Mr. (now Sir) James Knowles as his architect, and John Gibson as gardener, to lay it out as an open space, which on July 2, 1874, he conveyed in trust to the Board of Works. The busts in the garden are of Hogarth, by J. Durham, A.R.A., Sir Isaac Newton, by W. C. Marshall, R.A., John Hunter, by T. Woolner, R.A., and Sir Joshua Reynolds, by H. Weekes, R.A. Signor Fontana executed the statue of Shakespear, after that by Scheemakers from a design by Kent, in Westminster Abbey.

New Oxford, Endell, Coventry, and Cranbourne Streets.—Sir James Pennethorne submitted several projects to a Committee of the House of Commons upon Metropolitan Improvements. After the issue of four Reports in 1836-40, an Act (3 & 4 Vict. c. 87) was passed for four improvements, entrusted to Pennethorne (obit 1870) and Thomas Chawner (obit 1851), joint Architects and Surveyors to the Woods, Forests, and Land Revenues. The four schemes; a meagre result of the inquiry, and in themselves greatly reduced through a mistaken spirit of economy; related to (a) an extension of Oxford-street to (High) Holborn; (b) an extension of Bow-street to Charlotte-street, Bloomsbury; (c) a widening and extension from Coventry-street to Long-acre; and (d) a new road from the London Docks to Spitalfields Church. The committee had been influenced by testimony in favour of curved connexions instead of straight routes, and the retention of existing streets instead of making new ones. The "dog's leg line" theory had warm advocates; the firm of R. Lambert Jones and Higgins, surveyors, and other witnesses, strongly maintained the advantages of diagonal or crooked crossings as contrasted with crossings at right angles. We mention those facts in passing to indicate what opinions prevailed when a general improvement of London streets was under consideration in the former half of the century. Pennethorne's original plans for the first scheme would have quite cleared away the most notorious quarter of St. Giles; to effect a small saving one half of the Rookery was left in the hope that the owners would pull it down. The second scheme preserved the west side of the old streets; the property on both sides of Endell-street remained many years but little improved, whilst an awkward crossing was made at Long-acre. Our plan (Fig. 3) embodies the two architects' revised plans, signed by them for the Report of 1840, for a road 1,950 ft. long and 60 ft. wide from Stevenson's, since Meux and Co.'s, brewery to Newton-street, through property appertaining for the most part to the Maynard and Bedford estates—the former lying on the north-eastern side of High-street, where is still the *cul-de-sac*, Maynard-street. The Duke of Bedford obtained 113,963*l.* for his freehold interests; the laying-out of Arthur-street completed the work, which cost 290,277*l.* 4*s.* 10*d.* Church-lane and Phoenix-street have lately been renamed

Bucknall-street: the curious can still follow the lines of the old Rookery in Lawrence (for a while renamed Green) street, and Maynard and Carrier streets between Dyott (for a while renamed George) street and High-street. New Oxford-street was opened to foot-passengers on June 9, 1845, and on March 5, 1847, to vehicles.

The houses on both sides were designed with continuous façades. The block between Meux and Co.'s brewery and Dyott-street had a ground floor constructed as an arcade with a mezzanine floor, and a row of squared reveals alternating with the windows of the third floor and containing the Royal arms carved in stone.* Nos. 10-8, built of red brick with strap and jewel enrichments in stone and cement, after the Jacobean style infrequent in London, are, by, we believe, Wigg and Pownall. Venetian windows distinguish the first floor of Nos. 9-19 in the opposite block. Two other revised plans, signed by Chawner and Pennington in June, 1840, relate to Endell and Cranborne streets. For the former street (Fig. 3) they pulled down the east sides of Hanover, Old Belton, and New Belton streets; Bowl-yard, so-called after the public-house where felons stopped to drink on their way to Tyburn; Salutation-court; and Middle-row, a group of twelve back-to-back houses in Broad-street nearly opposite Bowl-yard (1843); they opened out Bow-court into Bow-street, Covent-garden. In the new street, named after the Rev. James Endell Tyler, rector of St. Giles, is Christ Church [March 8, 1845], by B. Perrey (*obit* 1880), after the XVIIth century style, built of Kentish rag with Bath stone dressings; the spire, shattered by lightning on August 17, 1887, was rebuilt by Mr. R. E. Tyler, who superintended the general repair of the church. At the north-west corner are the St. Giles's National Schools [December 22, 1860, with two plans], by E. M. Barry. G. J. Vulliamy (*obit* 1886) was architect of the adjacent Swiss Protestant Church, 1853-4; the Baths and Washhouses opposite, by Baly and Pownall, 1852, were improved and enlarged in 1900 by Messrs. Clarkson. The later parish Round-house, or Lock-up, in Coal-yard (since Goldsmith-street), gave place in 1884 to the new almshouses on the east side of Barley-court: the inscribed stone tablet is preserved in a cellar there. The Board schools in Coal-yard were erected about thirty years ago on the site of the "Galleries," another typical Rookery.

(To be concluded in our next.)

LONDON COUNTY COUNCIL AND TECHNICAL EDUCATION.

THERE was last week on view a collection of examples of work done by the students of the London County Council's Shoreditch Technical Institute, which, as illustrating the latest developments in Local Government, and as offering practical evidence of the growth of the modern reaction against the mechanical ideal in the handicrafts, is worthy of some attention.

The exhibition, if the unassuming display of the work of the Institute's classes may be so termed, was at the Institute, which lies in Pitfield-street, opposite Mr. Hare's Shoreditch Free Library and Baths, a building which is itself in every sense a monument to education in its best aspects. The Institute Building was formerly known as Aske's School, Hoxton—the old school of the Haberdashers' Company, from whom it was acquired six years ago by the London County Council, which has dedicated the old playing ground to the purposes of a public garden, and has built certain workshops at the back, remote from Pitfield-street.

No consideration of the exhibits can have much point without reference to the scope and purpose of the Institution. The school is organised on solely practical principles, and all teaching is designed to be directly applicable to the needs of the artisan. The Trade Classes are strictly confined to those who are actually engaged in the various trades, either as a means of livelihood, or with a view to making the trade a means of livelihood. The term, "Trade Classes," excludes Domestic Classes for women. The trades include carpentry, joinery, upholstery, plumbing, electric-wiring, French polishing, plasterer's work, and some few others, but "cabinet making and the allied trades" are those to which chief attention is given, and to which we will here confine ourselves.

The course consists in classes and workshop

* The arms formed the subject of legal proceedings recorded in our columns of April 11 and May 23, 1903.

training. The class work deals exclusively with Applied Science and Applied Art, and the work done in the shops by any student, has been the subject of his previous lectures. The student himself makes complete drawings of each subject, and takes off quantities and prepares shop lists of materials before setting out his work.

In the Art Classes copying is discouraged. Lessons in design take the form of studies from natural objects; the application of those studies of natural form to a conventional arrangement or pattern which is indicated to the student by dots or by other means; and by studies made at South Kensington Museum, which are set up as "motives" for design, and so forth.

The visitor to the school readily perceives that here at least there is no indolent dilettantism, none of that self-congratulation of the "artist" which has made the valuable Arts and Crafts movement sometimes so tiresome to its well-wishers, and so slow to commend itself to a public not wholly undiscerning. In these classes and class lectures we may rest assured there is no delay about aesthetic theories, for there is here the serious business of life to hand. And this consideration takes us from the principles of the teaching, to the conditions under which they have to be applied, and it is here that the difficulties of the directors of the school lie.

Shoreditch is a centre of the furniture trade, good, bad, and indifferent. The school teachers have to contend with the prejudices and traditions of that trade and with the appalling ideals derived from the fascination of the marvelously accurate achievements of machinery. The journeyman, the improver, the advanced apprentice, who for a small fee are able to attend the evening classes to the average number, this last season, of one hundred, are receptive at all points except at that precise point where the school is most ambitious to instruct. There the student is stoical. His attitude is respectful, and is perfectly logical and sound. If pressed he speaks somewhat as follows:—"You may be right in what you say, but I have been carving an acanthus scroll on Chippendale armchairs for the past five months, and this is the way my master will have acanthus done, and if I do not do it so, I shall lose my place."

Accordingly there are exhibited at Shoreditch certain carvings of great mechanical skill, copies, sand-papered, stained, and wonderfully polished, such as you may see in the panel of a thoroughgoing Victorian rosewood piano-case, at any musical warehouse. With regard to the evening classes, therefore, which are attended by journeymen and others, the Directors and others can only hope for better things: but with regard to the Day Classes, which are confined to boys of from thirteen to seventeen years old, they can recognise clear indications of the good results borne already by their Art teaching.

Among the exhibits of work done by students who have been trained in the Day school, there are examples which it is difficult to realise as the design and workmanship of boys of sixteen and seventeen. The variety in the treatment of a class subject shows the initiative encouraged in the individual student. The whole of the exhibits generally show appreciation of the material used, reserve in decoration and refinement of line and proportion; and many of the designs have distinction. The whole of the exhibits are free from affectation, and while it may be said that nearly every article of furniture exhibited is by its quality of design associateable with no other epoch than the present, "L'Art nouveau" is entirely absent in every and all its variegated eccentricities. Healthy, practical, under good auspices, and with the promise of high attainment before it, the Shoreditch Technical Institute should have universal good wishes. The importance of the Institute may be indicated by the fact that 750 students were attending its classes last session.

PUBLIC HALL, BENTHAM, YORKSHIRE.—The foundation-stones were recently laid, at Bentham, of a new public hall and institute. The plans for the proposed work, which have been drawn by Mr. T. A. Foxcroft, of Settle, provide for a stone structure, comprising a room which can be used for lectures and meetings of parishioners, a recreation room, billiard-room, news-room, library, and kitchen. The total cost is estimated to be 800*l*.

THE BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.*

Mr. C. C. SMITH, Assoc. M.Inst.C.E., read a paper on the treatment of moorland water to prevent action upon lead pipes, written by himself and Dr. E. M. Chaplin. He said the catchment area from which the Wakefield Corporation obtained its supply formed a portion of the Rishworth Moors, situated on the borders of the West Riding of Yorkshire, about half-way between Halifax and Oldham; its elevation varied between 1,000 ft. and 1,500 ft. above sea-level, and it consisted chiefly of moorland. Peat covered the surface, varying from 6 in. to over 20 ft. in thickness. Underlying the deeper peat in many places were deposits of clay and outcrops of shale. In other places where the peat was thin, the millstone grits were close to the surface. In many parts of the moor where the peat was deep and rested on clay, the ground was soft and marshy, and the water running from it had a peaty colour and taste. Dr. Houston had proved beyond doubt that it was by contact with the peat that the water acquired its acidity and power to attack lead. The works at Rishworth consisted of the Green Withens Reservoir, capacity 242 million gallons, which in addition to being fed by its natural gathering ground, had two catchwaters each over a mile in length, having a flat bottom and sloping sides pitched with stone.

The Ringstone Reservoir had a capacity of 245 million gallons. This had practically no natural gathering ground, but was fed by the Moss Moor Catchwater, 4½ miles long, which had a circular brick bottom, and sloping sides constructed in brickwork and masonry. From the Ringstone Reservoir a pipe-line carried the water to the Ardsley Reservoir—a distance of 17 miles. Ardsley Reservoir was about four miles from Wakefield, and had a capacity of 334 million gallons.

A portion of these works was completed and the water supplied to the city and out-districts in 1888. During the following three years complaints as to lead-poisoning gradually increased until early in the year 1892, when they became so numerous that the Corporation called in Dr. Percy Frankland to investigate the whole matter, and report as to the steps to be taken to counteract the action of the water upon the lead pipes. After a detailed examination of samples of water from the various feeders and streams from the several reservoirs, and from various draw-off taps in the area supplied, and after many laboratory experiments as to the best method of counteracting the solvent action of the water, Dr. Frankland presented a complete report to the Corporation. He found that whilst the gathering ground yielded a water of "Exceptional organic purity admirably adapted both for kitchen and industrial purposes, yet it had a very marked action upon lead, but one which it is quite possible to remove by several distinct methods of treatment, namely—(a) treatment with carbonate of soda; (b) treatment with finely-divided carbonate of lime or chalk; and (c) filtration through finely-granulated limestone."

The authors described very fully the different methods which had been adopted for counteracting the plumbo solvency in the water, and thus summarised the conclusions arrived at:

1. Treatment with carbonate of soda is easily carried out, and is effective, but at the same time it is a very expensive method of treating acid waters.
2. Filtration through sand may be effective whilst the beds are new, but the sand rapidly loses its power of preventing plumbo-solvency.
3. Only a limited quantity of lime or chalk can be usefully added to the water prior to filtration, for if the water is rendered strongly alkaline at this stage, it loses a portion of its alkalinity in passing through filter-beds.
4. With the water experimented upon, it was found best to add one grain of chalk prior to filtration, and from one to two grains of lime after filtration, the lime being added in the form of clear lime-water.
5. The prevention of plumbo-solvency by utilising the dry-weather flow only for domestic consumption is not practicable in the majority of moorland water schemes, it being necessary to store the flood-water for all purposes, especially when such water forms a large percentage of the flow.
6. The use of pipes of other metals than lead has not been found to give entire satisfaction, and even if a perfect pipe were available, the

* Concluded from last week.

large number of lead service-pipes now in use would render treatment of the water necessary.

7. Limestone and chalk as foundations for filter-beds are not of permanent value, owing to the surface of the stone becoming covered with deposit, and so preventing the water from coming in contact with it.

Dr. Chaplin said this question was a very important one to them in the West Riding of Yorkshire, and during the last few days the question had been raised as affecting Leeds. They found they could reduce the action of the water upon lead to an inappreciable extent, and it was very inexpensive and easy to work.

Mr. Jones, Leyton, remarked that the damage done by lead-poisoning was very great. Mr. Simpson said he would like to know if enamelled wrought-iron pipes had ever been used, because he remembered some twenty years ago his grandfather's house in the country was entirely fitted up with such pipes.

Mr. Smith said many wrought-iron pipes had been taken out, but he had never seen any enamelled.

This concluded the technical business of the meeting. A visit was made to the pumping-stations of the Hull Waterworks, and a visit was made to various Belgian waterworks—Antwerp, Brussels, the inter-communal works for supplying the suburbs of Brussels, and the Verviers Works at Gilleppe.

Illustrations.

PROPOSAL FOR REMODELLING THE FRONT BLOCK OF THE NATIONAL GALLERY.

SOME ten years ago I exhibited at the Royal Academy a perspective drawing with a plan nearly similar to this one, for re-modelling the front block of the National Gallery. The drawing, though on a large scale, was really rather a sketch than a serious study, and the central group was carried too high and in other respects did not satisfy me.

The present elevation represents the same general idea more carefully worked out. The centre dome is considerably lower and is treated as a dome in solid masonry (as also the smaller cupolas at the ends); for in these days of Portland cement it seems absurd to assume that a masonry dome cannot be built so as to be weather-proof, and the gain in monumental effect is incalculable.

A main factor in the idea was to get rid of the extraordinary jumble of staircases having no architectural connexion with each other, which at present exist in the interior. Had there been a large-minded First Commissioner of Works in office at the time, or had the then First Commissioner consulted an architect of genius, something better would surely have been done than putting in that timidly-designed central staircase, so arranged that one cannot get from the central to the side galleries without going down one flight of steps and up another!

It is assumed that all the land included in the re-modelled plan will eventually come into the National Gallery site, and therefore should be treated as a symmetrical plan, and given some effect of centralisation and vista. The arrangement here shown gives one central hall and staircase with a large dome over it, a fountain in the centre of it, and a long colonnaded vista each way, closed by the apse with a sculptured group. A similar apse forms a termination of the vista along the wings from back to front. The colonnaded would form a space for the exhibition of works of decorative art, which at present find no place in the National Gallery.

As to the suggested alterations in the external architecture, some people will no doubt object to interfering with a well-known building; but while the refinement of Wilkins's Greek detail is fully admitted, it surely must also be admitted that the existing cupola is an exceedingly timid and weak feature, quite unworthy of its position; and the little cupolas at the ends have of course become almost bywords. Something of the kind and on the scale here suggested, at all events, would surely be preferable; nor could any adequate central hall and staircase be carried out without it. Wilkins's porticoes and lower wall are retained unaltered, except that a new inner column is inserted at each end of the central portico to

give greater depth of effect. The upper blank window-spaces (a very poor device) are filled up and replaced by a frieze of carved ornament. The quadrant line of the pavement at the south-east angle suggested the semicircular bay following its line. It would have been better, as a matter of appearance, to have placed the two pilasters at the extreme ends of the façade close together, to strengthen the angle; but that would involve more cutting down and rebuilding; the two pilasters as shown are left as they now stand. The angle turrets which flank the central dome are finished with cupolas which are intentionally a reminiscence of the finish of the present little cupolas which have been derisively termed the "peppercots."

There is an odd little history as to the treatment of this design by the Royal Academy. The first and rather crude coloured perspective was crossed on the back and sent back to me with the usual curt intimation that the Academy "cannot accept" it—i.e., that it is too bad to hang. I did not at once remove it, and to my surprise received a "varnishing day" ticket and found the condemned drawing hung in a central position. An architectural critic in the *Art Journal* said it was the most notable contribution of the year in the Architectural Room. I dare say he was wrong, but that such a remark should be made of a drawing which the powers of the Architectural Room had in the first instance condemned as not good enough to exhibit, is at all events amusing. The present drawing was accepted at the Academy, but crowded out at the last moment with the usual polite assurance of regret that they could not "find space." Perhaps it is only fitting that executed buildings should take precedence of what the French call *projets*; yet it is possible that some readers of the *Builder* may be disposed to admit that this is of more interest than some of the drawings for which the Academy were able to "find space" in the Architectural Room this year.

H. H. S.

ALTERNATIVE DESIGN BY WILKINS FOR UNIVERSITY COLLEGE.

UNIVERSITY College was founded in 1827, as London University, by the efforts of Lord Brougham, Campbell the poet, James Mill, Grote, Mackintosh, Joseph Hume, Bentham, Dr. Birkbeck, and others, for affording "literary and scientific education at a moderate expense," and the scheme included a hospital and a boys' school. Isaac Lyon Goldsmid acquired the site of about seven acres for 30,000*l.*, and conveyed it at cost price to the proprietors. The roll of professors includes Augustus de Morgan, Lindley, who may be called the father of modern botany, John Austin the jurist, Andrew Amos, and Sir Charles Bell, one of the greatest of physiologists. Under a charter of incorporation the title of the institution was changed to that of University College, a style that was retained at the re-incorporation in 1865; the college now forms a constituent part of the University of London.

The Report of the Council of Proprietors, dated September 30, 1828, contains a drawing (with plans of the three floors of the main block), entitled, "Design adopted by the Council for the University of London." With the drawing and plans should be compared the plan and drawing preserved in a portfolio of Wilkins's designs in the library of the Institute of Architects. We purposely cite the two drawings because they clearly show that Wilkins intended the quadrangle to remain open on the west side except for a low colonnaded screen and a middle raised gateway, and because the elevations of the two wings added since differ from those of the wings as they appear in the "adopted design." In the latter their western ends are finished with a projecting stylobate and a tetrastyle portico of disengaged columns carrying a pediment. The centre of the façade of each wing is surmounted by a small cupola rising from a low podium, quite different from the tower shown in the design here published. When the report of 1828 was made the two wings had not been begun, and the middle block, of which the Duke of Sussex laid the first stone on April 30, 1827, was still in the hands of Henry Lee and Sons, the contractors.

Wilkins died in 1839. In 1845 Professor T. L. Donaldson completed the laboratories. Three years afterwards the vestibule of the main block was remodelled as the Flaxman Hall by Professors C. R. Cockerell and T. L. Donaldson. In 1848-51 the hall at the rear of the vestibule

was replaced, after a fire, with the library and its staircase by Professor Donaldson. In or about 1867 Professor T. Hayter Lewis added the eastern part of the south wing, which was extended westwards in 1878. At the middle point of that wing on the inner side is a rounded bay surmounted with a cupola, instead of the square podium and small cupola of the "adopted design." The corresponding north wing, by Lewis, was begun in July, 1878, and opened in February, 1881. The extension westwards to the footpath of Gower-street of the south wing, with a portion of the return front, to be four stories high including the basement, along the street, are by the late Professor T. Roger Smith. (See the plan in the *Builder* of June 3, 1903.) The west end of the south wing, thus extended, has an order of pilasters only, and is in that and other respects a manifest departure from the "adopted design." Our readers will remember that we pointed out at the time how the new engineering and electrical laboratories have deformed and spoiled one of the most remarkable buildings of its period and style in London. Now that the school is to be transferred to another site, it is to be hoped that this return building will be removed. We believe that some at least of the Council are quite convinced that it was an architectural blunder.

Though the arrangements have been altered since, we may mention that Wilkins planned the basement and ground and upper floors of the main block symmetrically on the north and south sides of the vestibules. He appropriated the basement for vaults, the students' common rooms (to the east of the vestibule), a refreshment room (south), rooms for the anatomical school, and the housekeeper's and steward's rooms. On the ground floor he planned, to the north and south, respectively, two lecture rooms (46 ft. by 24 ft.), a paved cloister for exercise (107 ft. by 23 ft.), a lower theatre (65 ft. by 50 ft.), a museum, and rooms for the professors; at the rear, projecting from the lower vestibule, he laid out two lecture rooms beneath the great hall (each 44 ft. by 38 ft.). On the upper floor he planned the middle vestibule beneath the dome; to the north a museum of natural history (120 ft. by 50 ft.), a museum of anatomy (49 ft. by 41 ft., and 23 ft. 6 in. high), and an upper theatre (65 ft. by 50 ft.); to the south the great library (120 ft. by 50 ft.), the small library (41 ft. by 22 ft.), an upper theatre (65 ft. by 50 ft.), etc. To the east of the vestibule he built the great hall (90 ft. by 45 ft., and 25 ft. 6 in. high) between the two courts; and the hall was replaced as we mention above, by the later library. In the south portion of the south range on the ground floor he planned the University office, the Council-room, and the clerk's room. The south wing is now occupied for the most part by the boys' school; the north wing is occupied by some of the science "sides," and by the Slade School of Fine Art.

We have no history as to the design here published. The engraving from which it is taken bore at the foot an old title and imprint stating that it was the design of Wilkins for London University; which imprint has been obliterated by a wise employee of the lithographer's, who appears to have assumed, on his own responsibility, that as we had put our own title in the usual form under the plate, the facsimile of the original title could be of no use! Our impression is that it is probably the design Wilkins himself preferred; the semi-circular colonnades at the ends of the wings would have had a charming effect, but they were perhaps considered by the Board not to be sufficiently utilitarian. On the other hand, the towers in the centre of the wings are not so good in effect as the cupolas shown in the "adopted design"; and these latter again are not so good as the centre features now there and designed by Hayter Lewis, who in this respect may be said to have improved on both of Wilkins's designs.

TWO STAINED GLASS WINDOWS.

THESE two windows are from the design of Mr. R. J. Stegless (London), who has exhibited several designs for stained glass at different times in the Royal Academy architectural room.

The left-hand drawing of these two was one exhibited at the Academy in 1900, and, as will be seen, represents the Nativity, with the Annunciation as a predella. The other design symbolises "Evening Prayer."



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ALTERNATIVE DESIGN MADE BY WILKINS FOR UNIVERSITY COLLEGE,
(FROM AN OLD ENGRAVING.)





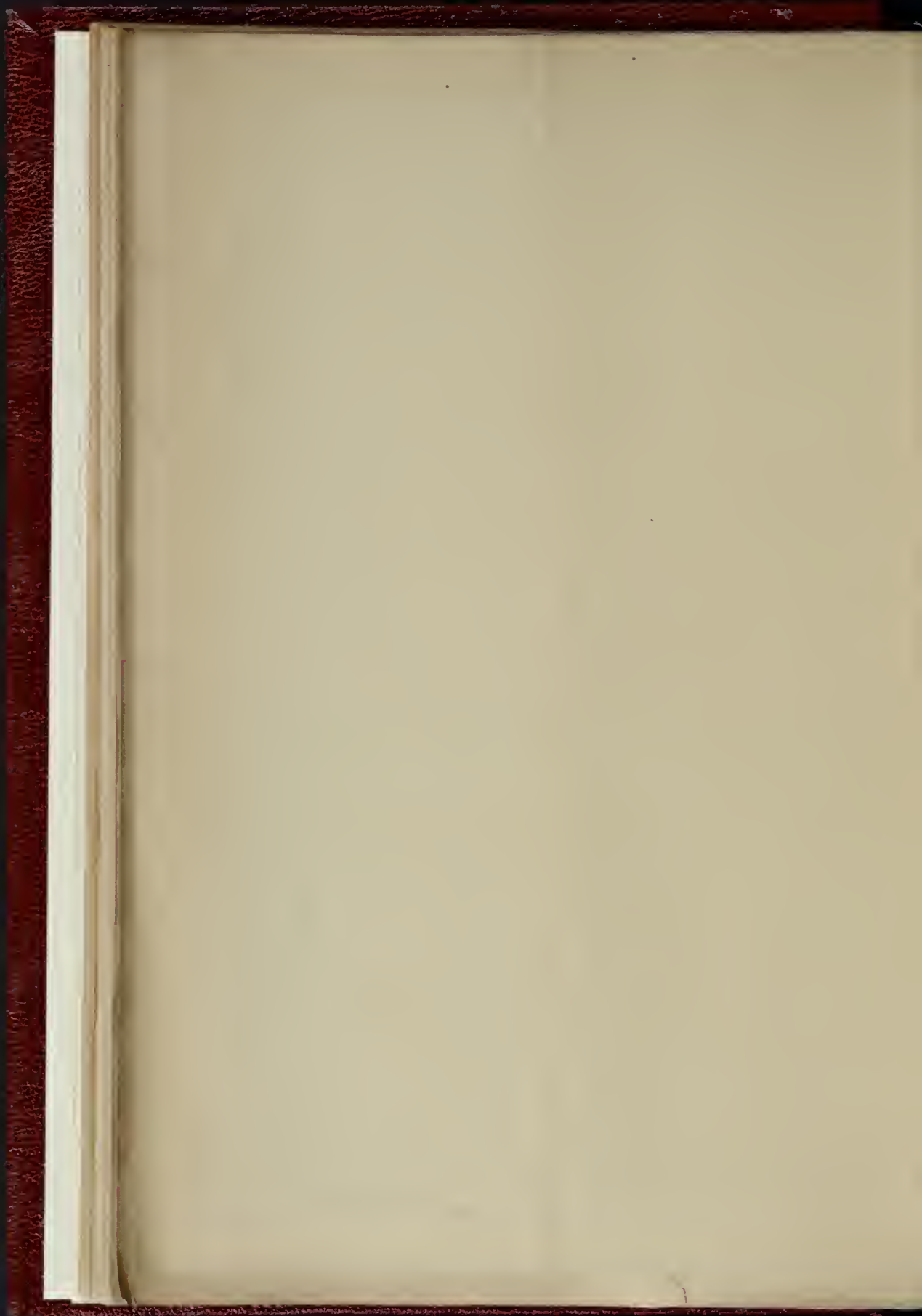
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TWO STAINED GLASS WINDOWS.—DESIGNED BY MR R. J. STEGGLES.



Springer & Co., Ltd., Printers, 4 & 5 East Harding St., E.C.

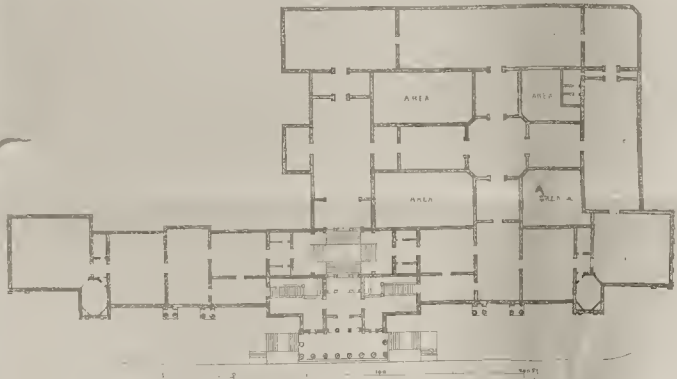
THE DE BURY MEMORIAL SLAB, DURHAM CATHEDRAL.—MR. G. H. KITCHIN, ARCHITECT.





H. H. STATHAM · INVT. ET. DELT.

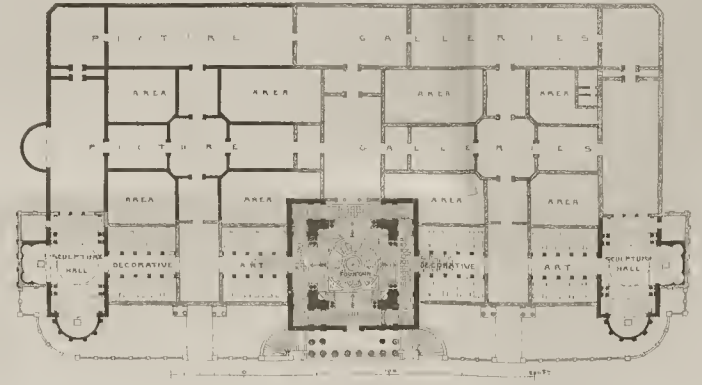
PLAN · AS · EXISTING.



THE OBJECT AIMED AT IN THIS DESIGN IS TO SUBSTITUTE A MORE MONUMENTAL DOME AND CUPOLAS FOR THE PRESENT SMALL DOME AND THE PEPPER BOXES AND TO FORM A GRAND CENTRAL HALL AND STAIRS IN PLACE OF THE PRESENT CONGERIES OF STAIR CASES ARRANGED IN NO DEFINITE PLAN.

SECTION OF CENTRAL HALL

PLAN · AS · PROPOSED.



PROPOSAL FOR RE-MODELLING THE FRONT BLOCK OF THE NATIONAL GALLERY, RETAINING THE EXISTING PORTICOES, CORNICE, AND WINDOWS.
 BY MR. H. H. STATHAM, F.R.I.B.A.

THE BIRD GARAGE CO. LTD. 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 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3845, 3847, 3849, 3851, 3853, 3855, 3857, 3859, 3861, 3863, 3865, 3867, 3869, 3871, 3873, 3875, 3877, 3879, 3881, 3883, 3885, 3887, 3889, 3891, 3893, 3895, 3897, 3899, 3901, 3903, 3905, 3907, 3909, 3911, 3913, 3915, 3917, 3919, 3921, 3923, 3925, 3927, 3929, 3931, 3933, 3935, 3937, 3939, 3941, 3943, 3945, 3947, 3949, 3951, 3953, 3955, 3957, 3959, 3961, 3963, 3965, 3967, 3969, 3971, 3973, 3975, 3977, 3979, 3981, 3983, 3985, 3987, 3989, 3991, 3993, 3995, 3997, 3999, 4001, 4003, 4005, 4007, 4009, 4011, 4013, 4015, 4017, 4019, 4021, 4023, 4025, 4027, 4029, 4031, 4033, 4035, 4037, 4039, 4041, 4043, 4045, 4047, 4049, 4051, 4053, 4055, 4057, 4059, 4061, 4063, 4065, 4067, 4069, 407



DE BURY MONUMENT, DURHAM CATHEDRAL.

This is a monumental slab in memory of Richard de Bury, Bishop of Durham from 1333 to 1345, which was presented to the Cathedral a short time since by the members of the Grolier Society, of New York. It is placed over the spot where the remains of the shop lie, in the chapel of the Nine Altars Durham.

The slab is executed in Sicilian marble. The idea of it was taken from the fine specimen of Bishop Bury's seal which is among the best treasures of the Cathedral. From this the original figure was worked, in face, attitude, and vestments. The only change is in the work which the figure now carries under the right arm, a representation of the Philibiblou; for, more than the pastoral crozier, is the characteristic feature of the prelate's life: the canopy under which he stands is simplified on that on the seal; and the two figures, each under his own canopy, represent letters and devotion. The inscriptions under these figures are from the fifteenth chapter of the Philobolion, chosen for the purpose by the Grolier Society:—

"On the Bishop's right we have
 Ilectant libri prosperitate felicitate ardentem,
 insolantur mibi fortuna terrentem.
 Books are a joy in good times, a consolation in bad."

On the left side we have
 ce pro libri adit beatitudinis nostras mercedem
 attingimus, dum adhuc existimus viatores;
 Helped by Books, while still pilgrims here, we view
 the garden of our blessedness."

The inscription round the slab runs thus:—
 HOC SVB MARMORE OSSA RICARDI D'AYNGERLE
 DICII DE BURY, D.G. EPISC. DVYNELM:
 A OBIT AD. MCCCLV. REINVENTVNT IN PACE:
 The memorial is designed by Mr. G. H. Kitchin, architect, of Winchester, the son of Mr. Kitchin, the Dean of Durham.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend £100,000 to the London Borough Council 10,414. for the erection of lodging-houses; Camberwell Borough Council 1,000. for contribution to the cost of reconstruction of canal bridge; Deptford Borough Council 10,000. for erection of town hall and offices; Fulham Borough Council 1,000. for electric light installation; and Hampstead Borough Council 4,300. for electric light meters.

Tramways.—On the recommendation of the Tramways Committee it was again agreed to make application to Parliament next session for power to construct tramways from the present terminus in Westminster-bridge-road across Westminster Bridge and along the Victoria-embankment, and by means of the authorised subway to the North side of the Strand.

A sum of 95,000. on capital account was authorised for the purchase of the undertaking of the London, Deptford, and Greenwich Tramways Company.

The Works Committee.—The Works Committee submitted a statement of works completed during the half-year ended March 31, showing the certified value and actual cost of works completed during the half-year. In Statement I. included the accounts for works, completed during the half-year, in respect of which complete specifications and bills of quantities have been prepared. On a few of these works some small expenditure has been incurred after March 31, but all such expenditure has been brought to account. The committee reported as follows: "We are glad to be in a position to bring present to the Council a statement which must be regarded as satisfactory, the result of execution of the works included in a balance of cost below final certificate 5,760. 18s. 6d., or nearly six per cent on the total of the final certificates. Twelve out of the thirteen works have been carried out at a cost below final certificate. . . . In one case only, viz., that of work No. 10, is there an excess of cost over final certificate, and in this case a very wet season greatly retarded the work and tended to increase the cost, and the sinking of the sewer in tunnel through private property proved more expensive than was anticipated. . . . We recommend that the excess, amounting to 1,573. 0s. 6d., of actual

cost over final certificate in respect of the construction of the southern high level relief sewer, Balham-high-road, be approved."

The recommendation was agreed to. The report included the following general observations: "The total cost of the works included in the statements now presented does not represent the turn-over of the department, because much of the expenditure on these works occurred previous to the half-year in question, while on the other hand much of the expenditure during the six months was upon works which are still unfinished. The approximate expenditure on works executed by the department during the half-year was 232,000. The number of works in respect of which full specifications, bills of quantities, etc., have been prepared, and which have been referred to us for execution and not yet included in the half-yearly statements of completed works submitted to the Council, is thirty-three, representing an estimated expenditure of approximately 1,416,000. At present we are aware of no reason why the works in progress should not be carried out for the amount voted in each case. We reported on November 17, 1903, that we had adopted percentages of 2 and 4 1/2 per cent. to be added to the expenditure on wages and materials charged to each estimated work completed during the half-year ending March 31, 1904, to cover general and establishment charges respectively. As, however, the total expenditure during the year 1903-4 proved to be larger than was anticipated when the above percentages were adopted, we have reduced the percentages to be added to the cost of works completed during the half-year to 1 1/2 and 3 1/2 respectively. We have fixed at 1 1/2 and 3 1/2 respectively the percentages to be added, to cover general and establishment charges, to the cost of estimated works completed subsequent to March 31, 1904."

Seepage-polluted Watercess.—The Public Health Committee recommended and it was agreed that expenditure not exceeding £200. be authorised for the purposes of an inquiry as to beds from which watercess is supplied to London, subject to the concurrence of the General Purposes Committee, under standing orders.

Sanitary Officers.—The same committee reported that since 1893 the number of sanitary inspectors in London had increased by some 66 per cent., from 188 in 1893, to 313 in 1904. Of the 313, 28 are women.

Iron and Glass Shelters.—Mr. H. Jephson moved, and Mr. Horniman seconded, that the Council is not prepared to sanction the construction of any iron and glass shelters over the pavement in Piccadilly, and that it be an instruction to the Building Act Committee accordingly.

Mr. White said the matter was under the consideration of the Building Act Committee, and that it would come before the Council at the next meeting.

The motion was then withdrawn by Mr. Jephson.

Charing-cross Station.—Mr. Greenwood withdrew the motion that has stood in his name for some weeks that the question of acquiring Charing-cross Station and Hungerford Bridge be considered, with a view to providing the railway company with a site on the Waterloo side of the river, and the using Hungerford Bridge for tramways, so that the Council's Northern and Southern tramways from Aldwych to Waterloo could be linked together.

Lamp-standards, Waterloo Bridge.—On the motion of Sir William Richmond, the following motion was agreed to without discussion: "That it be referred to the Bridges Committee to report immediately as to the removal of the original bronze lamp-standards on Waterloo Bridge and the substitution therefore of lamp-standards wholly out of character with the bridge, and of particularly feeble design, and as to the possibility of the reinstatement of the original lamp-standards."

The Council then adjourned.

NEW PUBLIC HALL, SOUTH BRENT, DEVON.—Plans have been prepared by Mr. Latham, architect, Kingsbridge, for a new public and market hall at South Brent. The building will be about 80 ft. long by 30 ft. wide.

ASSEMBLY BUILDINGS, BELFAST.—A new hall for the General Assembly of the Presbyterian Church in Ireland is now being erected in Belfast. The work is being erected from the designs of Messrs. Young and Mackenzie, architects.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Line of Frontage and Projections.

Hackney, Central.—Retention of projecting steps in front of No. 232, Mare-street, Hackney (Mr. J. B. Westcott for Messrs. Hellis and Son).—Consent.

Hackney, North.—Balconies to proposed buildings on the north and south side of Holmleigh-road, Stamford-hill, Hackney (Mrs. F. A. Cave).—Consent.

Lewisham.—Stone hoods to porches in front of Nos. 42, 44, 46, 48, and 50, Algiers-road, Lewisham (Messrs. Tompkins and Connew).—Consent.

Lewisham.—Retention of a one-story addition to a house on the north side of Ewhurst-road, Lewisham, abutting upon the west side of Salehurst-road (Messrs. J. G. Nicolls and Sons).—Consent.

Wilmington, West.—Three houses, Nos. 41, 42, and 43, De Laune-street, Kennington (Messrs. E. Briant and Son for Mr. A. F. De Laune).—Consent.

Norwood.—Buildings upon a site abutting upon the south side of Rothschild-street and west side of High-street, West Norwood (Mr. T. Martin).—Consent.

Paddington, South.—An oriel window at No. 5, Cleveland-gardens, Hyde-park (Messrs. C. J. Mann and Son).—Consent.

St. George, Hanover-square.—A portico at No. 31, Wilton-place, St. George, Hanover-square (Messrs. Davis and Emanuel for Lady Jones Parry).—Consent.

Wandsworth.—Houses with shops on the west side of Mitcham-road, Tooting, northward of the "Foresters' Arms" public-house (Mr. W. C. Poole for Messrs. Swain and Selley).—Consent.

Westminster.—Mouldings upon oriel windows at "Parliament Chambers," Great Smith-street, Westminster (Messrs. Falgrave and Co. for Mr. E. J. Read).—Consent.

St. Pancras, West.—One-story shops upon a site abutting upon the eastern side of Stanhope-terrace, Regent's-park, St. Pancras, and southern side of Delancey-street (Mr. A. Whitelaw for the London and North-Western Railway Company).—Refused.

Width of Way.

Brixton.—Buildings upon the site of Nos. 8, 10, and 12, Clark's-row, Rohsart-street, Brixton (Messrs. H. Bragg and Sons for Mrs. R. Slade).—Consent.

Whitechapel.—Working class dwelling-house on a site abutting upon the north side of Montague-street and west side of Bell-lane, Whitechapel (Messrs. D. Cubitt, Nichols, Sons, and Claxet for Mr. H. Friedlander).—Consent.

Rotherhithe.—Buildings upon the site of Nos. 16 and 17, Magdalen-street, Bermondsey, with external walls at less than the prescribed distance from the centre of the roadway of the street (Messrs. F. Chambers and Son for Messrs. R. Dickeson and Co.).—Consent.

Wandsworth.—A one-story building at the rear of No. 251, Upper Richmond-road, Putney, with external walls at less than the prescribed distance from the centre of a roadway leading out of the east side of Lower Park-fields (Mr. C. L. Banks for the trustees of Mrs. E. Gerhold and Mr. A. Gerhold).—Consent.

Lines of Frontage and Construction.

Hampstead.—Retention of a wood and iron building on the north side of Sandwell-crescent, West End-lane, Hampstead (Mr. W. Sandeford).—Refused.

Hampstead.—The retention of a wood and iron fire station building on part of the forecourt of No. 138, Maids-valle, Kilburn (Mr. O. Fleming for the Fire Brigade Committee of the Council).—Consent.

Lines of Frontage and Width of Way.

Lewisham.—A block of residential flats, with bay windows and a one-story addition in front, at No. 155, High-street, Lewisham (Mr. C. A. Geen).—Consent.

Clapham.—The rebuilding of the "Wirtemberg Arms" public-house, abutting upon Wirtemberg-street and Cross-street, Clapham (Mr. W. Husband for Mr. J. E. Manktelow).—Consent.

Hampstead.—Mission buildings on the site of Nos. 8 and 10, Broomsleigh-road, West Hampstead, abutting also upon Dornfield-street, with projecting porch, oriel window, and buttresses (Messrs. Whitfield and Thomas for the Rev. E. N. Sharpe).—Consent.

St. George, Hanover-square.—An addition to No. 19, Minerva-mews, Chester-terrace, St. George, Hanover-square (Mr. W. E. Mills for Mr. C. H. B. Wentworth).—Refused.

Width of Way and Construction.

Battersea.—Retention of wood and iron enclosures to the belting on the third floor of premises on the north-west side of Church-road, Battersea, the iron framing supporting the water-tank on the roof, and the retention of a forecourt wall at less than the prescribed distance from the centre of the roadway of Church-road (Mr. H. Branch for Messrs. Mayhew, Ltd.).—Consent.

Formation of Streets.

Islington, North.—That an order be issued to Mr. C. J. Bentley, sanctioning the formation or laying out of two new streets for carriage traffic to lead from Hornsey-lane to Whitehall-park, Islington, and in connexion therewith the widening of a portion of Hornsey-lane (for Mr. G. Wills).—Consent.

Woolwich.—A deviation from the plans approved on October 1, for the formation of new streets to lead out of the east side of Shrewsbury-lane, Plumstead, so far as relates to the widening of Shrewsbury-lane at the southern end of the estate (Mr. W. Parish).—Agreed.

Woolwich.—A deviation from the plans approved for the formation of Bereta-street, Footscray-road, New Eltham (Mr. G. Bush).—Refused.

Space at Rear.

Strand.—An addition at the rear of No. 17, Chartes-street, Haymarket, upon part of the space at the rear of that building (Messrs. Treadwell and Martin for Messrs. W. Dunstan and W. J. Styles).—Consent.

St. George, Hanover-square.—Alterations and additions to No. 34, Wilton-road, St. George's, Hanover-square (Mr. A. J. Wood for Mrs. R. Morris).—Refused.

Buildings for the Supply of Electricity.

Kensington, South.—Retention of an addition and erection of a further addition at No. 11, Chapel-place, Kensington (Mr. J. Slater for the Kensington and Knightsbridge Electric Lighting Company, Ltd.).—Consent.

Deviations from Certified Plans.

Finsbury, East.—Deviations from the plans certified by the District Surveyor, so far as relates to the proposed rebuilding of "The Royal Oak" public-house, abutting upon Waterloo-street and Galway-street, St. Luke's (Messrs. Willis and Leslie).—Consent.

Alterations to Buildings.

Paddington, South.—Raising of the back addition of No. 16, Bayswater-terrace, Paddington, and the construction of an additional story in the roof of the main building (Messrs. Trant, Brown, and Humphreys for the Misses Johnston).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ENGINEERING SOCIETIES.

INSTITUTION OF ELECTRICAL ENGINEERS.—The annual conversation of the Institution of Electrical Engineers took place in the Natural History Museum, South Kensington, on Tuesday evening. The guests were received by Mr. Gray and Mr. Alex. Siemens, and spent a most enjoyable evening. As usual, there were no technical exhibits, but a carefully chosen programme of instrumental and vocal music was given with excellent effect.

COMPETITIONS.

NEW COTTON EXCHANGE, LIVERPOOL.—The award of Mr. F. G. Briggs, F.R.I.B.A., the assessor on the designs for the New Cotton Exchange sent in by competing architects, and which has been confirmed by the directors, is as follows:—The design No. 22, by Messrs. Matear and Simon, is recommended for adoption. No. 15, by Mr. Richard Holt, for the first premium of 250*l.*; No. 20, by Messrs. Grayson and Ould, for the second premium of 150*l.*; and the third premium of 100*l.*, divided between No. 2, by Messrs. Gilling and Moorhouse, and No. 19, by Mr. Henry Hartley.

SCHOOL AT SOUTHALL.—At the meeting on Thursday of last week of the Middlesex County Council it was announced that Mr. Paul Waterhouse, the assessor appointed by the President house, the assessor appointed by the President house, the assessor appointed by the President house, in respect to the erection of a new public elementary school at Southall, to provide accommodation for 800 children, had made his award as follows:—(1) Mr. C. E. T. Laurence, 22, Buckingham-street, Strand, W.C.; (2) Mr. J. Mann, Hayes; (3) Mr. W. L. Eves, Usbridge. A motion was passed appointing Mr. Laurence architect at a commission of 5 per cent., subject to tenders being obtained for

the work showing the total cost of the buildings not to exceed 12½ per cent. above £11 per head on the accommodation provided, and on the understanding that the working drawings are to become the property of the County Council.

BOOKS RECEIVED.

HYDRAULIC POWER AND HYDRAULIC MACHINERY. By Professor Henry Robinson. Third edition. (Chas. Griffin and Co.)

MUNICIPAL SHORTCOMINGS. By T. Myddelton Shallcross. (Elliott Stock. 1s.)

MODERN COTTAGE ARCHITECTURE. Illustrated from works of well-known architects. Edited by Maurice B. Adams. (B. T. Batsford. 10s. 6d.)

RAILWAY MAXIMUM RATES, CHARGES, AND TRAFFIC ACTS. By M. B. Cotsworth. Third Edition. (Dunrose and Sons. 10s. 6d.)

DUNSTABLE: ITS HISTORY AND SURROUNDINGS. By Worthington G. Smith. (Elliott Stock.)

PIONEER IRRIGATION AND LIGHT RAILWAYS. By E. O. Mawson, M.Inst.C.E., and E. R. Caltrop, M.Inst.C.E. (Crosby Lo-wood and Son.)

FIRE PROTECTION ON BOARD SHIP. By Edwin O. Sachs, A.Inst.M.E. (British Fire Prevention Co. 2s. 6d.)

Correspondence.**"THE PLENUM SYSTEM OF VENTILATION."**

SIR,—As your issue for last week contains a reply by Messrs. Henman, Cooper, and Lea, to the statements contained in my paper published in the "Journal of the Royal Institute of British Architects," perhaps you may kindly permit me to correct certain inaccuracies in their figures (and to give my authorities), which show that they have seriously misrepresented the facts.

According to the annual report of the Royal Victoria Hospital, Belfast, for 1902, the number of beds in the old hospital was 196; these were for patients only, and *exclusive* of those required for a large staff of doctors, nurses, servants, and others. But Messrs. Henman, Cooper, and Lea state that there were only 130 "residents."

In the new hospital there are only 293 beds for patients, and at the present time only about two-thirds of these are occupied; many of the wards were quite empty, or very nearly, last month at the time of my inspection, and probably there were not more than 200 patients in residence, or possibly a few more than in the old hospital. But Messrs. Henman, Cooper, and Lea state that the new hospital will contain 400 "residents," but admitting that at present there are only 300.

It will therefore be seen that the authority from whom I obtained the information as to the number of patients in the old hospital and new one being about equal, was fairly correct; indeed, it would be surprising to me to find an error, inasmuch as the statement came through the chairman of the Board of Management of the hospital to the writer of a letter before me. And this is a reasonable conclusion to draw, for it is not probable that the number of Belfast patients would very greatly increase during one or two years.

But, as I do not know the *exact* numbers, I will give the numbers of patients in both the old and new hospitals as being about equal, although admitting the possibility of a slight increase, which could not, however, materially affect the comparison I am about to make, and I will accept, as correct, the estimate quoted by Messrs. Henman, Cooper, and Lea, that the coal consumption for the new hospital will be 1,800 tons for this year, against the 516 tons used in the old hospital, according to the report for 1902.

Old hospital for 200 patients—coal used, per patient, 24 tons.

New hospital for 200 patients—coal used, per patient, 9 tons.

New hospital for 300 "residents" (as at present)—coal used, per resident, 6 tons (according to Messrs. Henman, Cooper, and Lea).

It remains to be proved that the enormous increase in the consumption of coal to six or nine tons per patient per annum is to be satisfactorily accounted for by an increased hot-water supply, additional laundry work, or the results attained for other purposes; in any case, it cannot be claimed that Plenum ventilation can compare favourably with scientific natural methods as to cost of fuel.

I have given the above figures for the purpose of correcting any impression that the new hospital is occupied by so many as 300

patients; that the old hospital contained many less patients than the new one, and in support of the statements contained in my paper also to remove possible mistakes with regard to the use of the words, "patients" and "residents."

Messrs. Henman, Cooper, and Lea have quite omitted to reply to the most serious point raised in my paper, in reference to the failure of the Plenum system of ventilation at Belfast to remove the vitiated air and smell from the operating rooms, by way of the exhaust provided for the purpose.

I have stated that the foul air and odour from these rooms (in which anaesthetics, or other chemicals, were being used at the time of my inspection) were being expelled through the joints of the doors when closed, and in volumes through the opened doorways; the smells were perceptible through the corridors, and to the interior of the large wards near the entrances to the same; I pointed out the failure to the official who conducted me through the premises, and he will be able to give any confirmation that may be asked for.

If vitiated air can be forced through doorways in this manner from one ward to another by this Plenum system, it cannot be said that the apartments are being properly ventilated; but it is clear that there was a very serious breakdown at these points, either from neglect or ignorance of the officials, failure of the mechanical appliances, or other disadvantages of unnatural methods of ventilation.

I think that I have advanced sufficient to show that Messrs. Henman, Cooper, and Lea were not at all justified in making their very injurious remark, to the effect that they hoped that "Mr. Bibby may be more accurate in the information he is collecting for his new work on 'The Planning of Hospitals,'" or it will be of no practical value to it is idle to write that my deductions are "obviously unreliable" without the slightest attempt to indicate the alleged error and supply corrections; it would have been better to have given some explanation, or excuse for the failure of the ventilation at the operating rooms, for instance.

From the reply of Messrs. Henman, Cooper, and Lea, it might be supposed that I had remarked adversely on the health of the medical staff of this hospital. I did not, and am not at all surprised to be told that the officials all enjoy good health, inasmuch as the portions of the hospital occupied by them are *not* heated and ventilated on the Plenum system, neither are they compelled to live like the patients in the institution, under glass roofs, and without the cheerful advantage of windows in the walls; staring at blank walls from week to week, or month to month, breathing air at one monotonous temperature, and writhing under the appalling uniformity of the conditions thrust upon them.

I do not know if the doctor connected with the Royal Victoria Hospital, at Belfast, who has complained of the health of his staff, entered the Plenum ventilated wards, is a visiting or a resident official; I had no such sensation myself, but was very glad to leave the wards, for the external air was fresh and wholesome after being for some time in an unnatural atmosphere. GEORGE H. BIRBY.

THE WAR OFFICE AND PATENT RIGHTS.

SIR,—It is to be hoped that among the many improvements the public are being led to anticipate from the recent clean sweep at the War Office something will be done to improve the position of patentees whose inventions the War Office may desire to use—all events, if the treatment a friend of mine received is a fair sample of what a patentee may expect from some Government officials.

Some years ago my friend invented a certain article which he patented, and the patent for which is still being kept in force by him by the payment of Government fees. Of this patented article my friend sold many thousands in the ordinary way of business. During the late war in South Africa some 125,000 of these articles were required by the War Office, and one would naturally expect that the officials would ask the patentee to tender for what was required.

Nothing of the kind. The authorities invited several firms to tender for these goods or a sample of my friend's invention, made and supplied by him in the usual way of trade, and bearing his name, and distinctive patent number punched thereon. Certain officials who were invited to tender directed the attention of the War Office officials to the fact that the articles they were asked to tender for were recognised as patented, but their apprehensions were allayed by official assurances that under the powers of the Secretary of State they were absolutely protected as contractors to the Crown.

As soon as my friend heard what was going

on—which he only did by chance through his own maker having been invited to tender—he pointed out to the War Office the unfairness of these proceedings, but to no purpose. They ignored him altogether, obtained the goods where they thought best, and even refused to give him—the patentee—the option of executing the order at the price at which it was placed elsewhere.

Now, the Patent Act says that it shall have the same effect against the Crown as it has against anyone else, and yet we have here a Government department refusing to recognise the grant by the Crown itself to my friend of certain exclusive rights. How, therefore, does my friend obtain—in the words of the grant—"the whole profit and advantage from time to time accruing by reason of the invention," if he is not even asked to tender for the supply of goods to be made under the patent, while others who have paid no patent fees are permitted to profit at the expense of the patentee, who is denied even the opportunity of accepting or rejecting the order?

The position of the Crown is not on all fours with that of the general public, inasmuch as, unlike that public, it is the grantor of the patent, and, therefore, should not attack its own grant by claiming to do gratuitously what it has forbidden all and sundry to do except on terms.

The War Office stated that it had been advised they need not pay any royalty for the use of my friend's patented invention. Who advised them? My friend has the written opinion of the very highest authority on patent law in the country that his patent is one that could be upheld in a court of law.

A patent must be assumed to be good and valid and the patentee entitled to all its benefits until a court of law decides otherwise, and it ought not to be possible for a Government department and its advisers to constitute itself a court of law and sit in judgment on a grant of patent made by that Crown, of which it is a department. But how can a poor inventor hope to fight against a Government department which has the State purse behind it?

My friend's loss has been a double one; first, he loses the profit someone made on the order, and secondly, as the articles were eventually not wanted owing to the war coming to an end, these articles were sold by the War Office for a mere song, and were at once thrown on the market and come into unfair competition with my friend's goods, as they were purchased at a price which enabled the buyers to undersell him, and a business of thousands has been reduced to one of hundreds.

I trust you will be able to find space for this in your journal, and that it may induce others to bring forward any similar cause of complaint.

SYMPATHISER.

[** The correspondence sent to us with this letter, and the eminent legal opinion referred to, entirely bear out the writer's statement.—Ed.]

The Student's Column.

NOTES ON PORTLAND CEMENT: CHAPTER I.—THE CONSTITUTION OF PORTLAND CEMENT.

WITH increasing demand for Portland cement of improved quality, experimenters on the subject are many, but its constitution still remains very uncertain and variable. The first to make advance in this direction was Le Chatelier, who, in 1887, published a paper on his research. His methods were a microscopical examination of the clinker and set cement and the synthetic preparation of the bodies supposed to exist therein.

Le Chatelier found that cement clinker in microscopical sections appears to be made up of constituents some of which are active and others inactive to polarised light. It seemed impossible to separate them from one another, hence he tried to construct bodies of like physical and chemical behaviour. Tricalcium-aluminate crystallises in cubes, and hence is optically inactive. He found a body analogous to this in the clinker. The chief constituent he found had weak optical activity, with well-defined crystalline form. This he believed to be a silicate of lime with the formula $SiO_2 \cdot 3 CaO$. Another silicate he found had a deep brown colour, optically inactive and more fusible than the preceding two. This he conjectured was an aluminoferrite of lime having the formula $2 (Al Fe)_2 O_3 \cdot 3 CaO$.

He produced such a body with the required properties. It is slowly acted on by water,

but does not contribute much to the setting properties of cement. Assuming that aluminate and silicate of lime were the chief constituents of Portland cement, Le Chatelier prepared these and examined them for their action on water.

Silicates. :

Monocalcium silicate $CaO \cdot SiO_2$ is not acted on by water, and can play no part in hardening of cement if present.

Dicalcium silicate $2 CaO \cdot SiO_2$ is formed by heating proper proportions of lime and silica in a crucible, falls to pieces on cooling, and Le Chatelier believed this spontaneous pulverisation due to change in crystalline form.

Tricalcium silicate $3 CaO \cdot SiO_2$ cannot be prepared by heating CaO and SiO_2 in proportion, a mixture of lime and lower silicates being always obtained.

Le Chatelier says, however, that this trisilicate may be formed by heating lime and fusible silicates, and concluded that it was the chief active compound in cement.

Aluminates.

Monocalcium aluminate $CaO \cdot Al_2O_3$, nearly infusible, sets rapidly with water.

Dicalcium aluminate $2 CaO \cdot Al_2O_3$, fusible, sets quickly with water, falls to pieces on boiling.

Tricalcium aluminate $3 CaO \cdot Al_2O_3$, very fusible, sets quickly, disintegrated on boiling.

Assuming that magnesia can take the place of lime and form similar compounds to the latter, and that iron oxide can replace alumina, Le Chatelier gives the formulæ:—

$$\frac{CaO + MgO}{SiO_2 + Al_2O_3} = \text{not greater than } 3,$$

$$\text{and } \frac{CaO + MgO}{SiO_2 + Al_2O_3 + Fe_2O_3} = \text{not less than } 3.$$

According to Le Chatelier, the reaction which took place when cement was acted on by water and allowed to set was chiefly the formation of hydrate of lime $[Ca(H_2O)_2]$ embedded in a mass of white crystals of hydrated monocalcium silicate ($CaO \cdot SiO_2 \cdot Aqua$) obtained by decomposition of the trisilicate.

The research of Le Chatelier was repeated and extended by Messrs. Newberry, who published their results in 1897. Their aim was to find:—

(1) What proportion of lime must be used for a given percentage of silica and alumina in clay.

(2) Can a general formula be stated applicable to all clays which will indicate the proportion of lime to give the best results with each.

Messrs. Newberry repeated Le Chatelier's experiments of making and examining silicates and aluminates of lime, with the results as shown in table.

two and a half molecules of CaO to one Al_2O_3 , the product is unsound.

The data thus obtained Messrs. Newberry used to determine the amount of lime that may be safely used with a clay of known composition.

The most highly limed silicate that can exist in a good cement having the formula $3 CaO \cdot SiO_2$, and the most basic aluminate being $2 CaO \cdot Al_2O_3$, the most highly limed cement will have the general formula $(3 CaO \cdot SiO_2)_x \cdot (2 CaO \cdot Al_2O_3)_y$. In $3 CaO \cdot SiO_2$, the ratio of lime to silica is 2.8, in $2 CaO \cdot Al_2O_3$, the ratio of lime to alumina is 1.1. Therefore, for 100 parts of clay proper ($SiO_2 \cdot Al_2O_3 \cdot Fe_2O_3$), the maximum lime required will be:—

$$\% SiO_2 \times 2.8 + \% (Al_2O_3 \cdot Fe_2O_3) \times 1.1.$$

These proportions are, however, only safe in practice with the finest grinding of raw material and finished cement. According to Messrs. Newberry, magnesia does not form hydraulic compounds with silica or alumina, and is incapable of replacing lime in cement.

Messrs. Newberry's research is interesting and of great practical value, but it throws very little light on the constitution proper of cement. The conclusion to be drawn from their work is that certain proportions of lime, silica, and alumina react on burning, giving a sound cement, but it does not tell us in what manner these bodies are combined.

In 1899 Rebuffat gave his views on the structural arrangement of the compounds forming Portland cement. These, he says, are composed of a crystalline compound of lime and orthosilicate of calcium, and aluminate of calcium in varying ratios. In opposition to Le Chatelier's conclusions that it is the tricaluminate $3 CaO \cdot Al_2O_3$, Rebuffat believes it to be the monocaluminate.

Along with the orthosilicate of lime compound there is also present in cement high in silica a quantity of $CaO \cdot SiO_2$. According to Rebuffat, the hardening process consists in the hydration of calcium orthosilicate producing a body having the formula $2 (SiO_2 \cdot 2 CaO \cdot Aqua)$, and the lime is set free forming crystalline hydrate. Hydration of the calcium aluminate also takes place. The metasilicate does not hydrate, but combines with the hydrated calcium aluminate, forming double compounds. Rebuffat ascribes the power of highly silicious cement to resist the action of sea-water to these latter compounds.

Zulkowski has drawn attention to a fact which most experimenters have overlooked. In making slag cement it is necessary to quickly chill the molten slag to give it the necessary hydraulic properties. If allowed to cool slowly, such a slag will frequently fall to pieces. The same phenomenon is noticed when over-burned cement clinker is allowed to cool in the air, such change resulting in different

SILICATES.

Formula.	Ratio of Lime to Silica.	Percentage Lime.	Percentage Silica.	Fresh-Water Test.	Deval's Hot Test.
(1) $2 CaO \cdot SiO_2$	1.86	65.11	34.89	Set hard; hard after six weeks.	Sound and hard.
(2) $2\frac{1}{2} CaO \cdot SiO_2$	2.33	79.0	30.0	Set soft; hard after six weeks.	"
(3) $3 CaO \cdot SiO_2$	2.80	73.66	26.32	Same as (2).	"
(4) $3\frac{1}{2} CaO \cdot SiO_2$	3.27	76.53	23.44	Cracked; soft; hard after six weeks.	"

ALUMINATES.

Formula.	Ratio of Lime to Alumina.	Percentage Lime.	Percentage Alumina.	Fresh-Water Test.	Deval's Hot Test.
(1) $2 CaO \cdot Al_2O_3$	1.1	52.33	47.62	Set quickly; hard; sound after six weeks.	Sound; fairly hard.
(2) $2\frac{1}{2} CaO \cdot Al_2O_3$	1.37	57.85	42.15	Set quickly; curved and cracked.	Curved and cracked; soft.
(3) $3 CaO \cdot Al_2O_3$	1.65	62.23	37.77	Same as (2).	Same as (2).

From these results Messrs. Newberry drew the conclusions:—

(1) Lime may be combined with silica in proportion of 3 CaO to 1 SiO_2 , and give a product of practically constant volume and good hardening properties, though hardening slowly. With three and a half molecules of CaO to one SiO_2 , the product is not sound.

(2) Lime may be combined with alumina in the proportion of 2 CaO to 1 Al_2O_3 , giving a product which sets quickly, showing constant volume and good hardening properties. With

properties of a material whose chemical composition remains the same, may be ascribed to dimorphism. Zulkowski says that this dimorphism is shown by the silicate of calcium of the formula $2 CaO \cdot SiO_2$. When two molecules of lime and one of silica are heated together the orthosilicate is first formed, having the structure $Ca < O > Si < O > Ca$. At a higher

temperature this body rearranges itself to form basic calcium metasilicate $O = Si < OCa > O$.

This basic compound is hydraulic. If when in the pasty condition it be quickly cooled the compound remains, but if allowed to cool gradually it changes once more to the orthosilicate, and the strains resulting from this change causes disintegration and the powder so formed has no setting properties. In opposition to Le Chatelier and Newberrys, Zulkowski holds that 3 CaO SiO₂ cannot exist in Portland cement, but that it is mainly composed of dicalcium orthosilicate, basic metasilicate, and free lime.

In support of his theories Zulkowski experimented on a sample of cement, from the analysis of which he assumed the following composition:—

Sodium and potassium silicates	3.43	per cent.
Sulphate of lime	2.45	"
SiO ₂ , 2 CaO	61.89	"
Al ₂ O ₃ , 2 CaO	12.14	"
Fe ₂ O ₃ , 2 CaO	4.95	"
Magnesia	.97	"
Lime	14.22	"

According to Zulkowski, such a cement ought to take up 14.67 per cent. water of hydration. The results actually obtained were 14.44 per cent. in twenty-one days, not increasing after this.

Dr. Loebell considers that Portland cement consists of from 11 to 26.6 per cent. free lime; 14 per cent. CaO SiO₂; 43 per cent. 2 CaO SiO₂; 23 per cent. 2 CaO (Al₂O₃ Fe₂O₃). According to Jex, the hardening of cement is caused by the formation of orthosilicate of lime from metasilicate and free lime. Steur, Wormser, and Spanjer consider that part of the free lime is dissolved in the cement, which accounts for large quantities not being objectionable. Hart and Meyer say they have detected free dissolved lime in cement clinker.

The results obtained from the experiments all indicate that lime is present in excess of that required to form CaO SiO₂. Le Chatelier and Newberrys believe this excess as being in combination as 3 CaO SiO₂. Rebuffat looks on it as forming a loose compound with 2 CaO SiO₂ = 2 CaO SiO₂, n CaO. Zulkowski regards the excess as free lime in variable proportions. In support of this there is also the opinion of Loebell, Steur, Wormser, Spanjer, Hart, and Meyer.

It is the author's opinion that Zulkowski's views are nearest correct, and that essentially Portland cement consists of ortho and meta dicalcium silicates, complex and variable aluminates and ferrites, and free dissolved lime. The free lime proper or that which comes from the coarse grains of chalk in the raw material will vary in a carefully-prepared cement from 1.5 per cent. to 4.5 per cent. in a cement made from coarsely-ground raw material.

Until some reliable method is devised for differentiating between free lime and loosely-combined lime, the constitution of Portland cement will remain uncertain.

METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of the Managers of the Metropolitan Asylum District was held at the offices of the Board, Victoria Embankment, on Saturday last week, Mr. Scovell presiding.

Correspondence was received from the Local Government Board in regard to various works proposed to be carried out at hospitals under the control of the Managers. Among the works sanctioned were the following:—Fire-resisting works to ten temporary wards and the temporary chapel of the North-Western Hospital, at an estimated cost of 4,500l., and alterations at the laundry of the Eastern Hospital, including rearrangement of machinery and plant, at a cost not exceeding 475l. The plans showing the proposed drainage works in connexion with the reconstruction of the South-Eastern Hospital were approved by the Local Government Board subject to the disconnection from the main system of all the drains from the infected blocks.

South-Western and Eastern Hospitals.—On the recommendation of the Finance Committee, it was agreed to apply to the Local Government Board for sanction to incur an additional expenditure of 169l. on the erection of fire-escape staircases at these hospitals. The amount previously sanctioned by the Local Government Board was 1,449l. for the execution of the work at both hospitals.

Loans.—The action of the Finance Committee in applying to the London County Council for loans amounting to 126,280l. was approved. Included in the loans is the esti-

mated cost of the erection of the Southern Hospital, 75,000l.

Leavesden Asylum.—Consideration of a long report of the Asylums Committee on the proposed purchase of additional land for the extension of the sewage disposal works at this asylum was postponed.

High Wood School.—The Children's Committee recommended, and it was agreed, that workshops, etc., should be erected at this school, at a cost of 360l. The matter was referred to the Works Committee.

Northern Hospital.—On the recommendation of the Hospitals Committee the Works Committee were instructed to take the necessary steps for the making good of the roads at this hospital. The Engineer-in-Chief's estimate of the cost of the work is 450l.

Darenth Asylum.—A plan prepared by the Engineer-in-Chief for the rearrangement of accommodation for the principal officers at this asylum was approved and forwarded to the Local Government Board for their sanction. The work is estimated to cost 250l.

Grove Park and Northern Hospitals.—The Works Committee, in their report, stated that they had been requested by the Hospitals Committee to arrange for the installation of mechanical stokers at those hospitals where they are not already in use. In April last the Committee submitted a report in which they pointed out that at the Brook Hospital, where the Meldrum type of mechanical stoker is in use, the result showed a saving of 955l. in the cost of coal consumed during the twelve months in which the stokers had been in use; the initial cost of installation having been only 786l. It was agreed, on the recommendation of the Committee, to accept the tender of Messrs. Meldrum Bros., Ltd., for the installation of four stokers at the Grove Hospital, at the sum of 925l.; four at the Park Hospital, at 935l.; and two at the Northern Hospital, at 415l.

Western Hospital.—A plan prepared by the Engineer-in-Chief for the enlargement of the engineers' and carpenters' shops at this hospital was approved and forwarded to the Local Government Board for their sanction. The estimated cost is 250l.

TRIBUNAL OF APPEAL CASE.

DISPUTE AS TO THE GENERAL BUILDING LINE.—The Tribunal of Appeal under the London Building Act, 1894, sat at the Surveyors' Institution, Great George-street, Westminster, on Tuesday, to hear an appeal by Messrs. Knapp, Fisher, and Sons, on behalf of the Incorporated Hospital and Home for Incurable Children against the certificate of the superintending architect of metropolitan buildings, under sections 22 and 29 of the Act, defining the general line of buildings on the north-east side of Finchley-road, Hampstead, between Netherhall-gardens and Adelaide-road, in which part of Finchley-road he further certified the building site in question to be situated; and further, certifying, under section 29 of the Act, that the said building site is situate in the road or street called Finchley-road, Hampstead.

The members of the Tribunal present were Messrs. J. W. Penfold, A. A. Hudson, and E. A. Grüning.

Mr. Cunningham Glen, barrister, appeared for the appellant, and Mr. Bailhache (instructed by Mr. Andrews, from the solicitors' department of the London County Council) for the respondents; Mr. Courthorn Munro represented the Hampstead Borough Council, and Mr. Skelton watched the proceedings on behalf of owners of houses in College Villas-road.

For the appellant it was submitted that the certificate ought to have been confined to that portion of Hampstead-road between College Villas-road and College Crescent-road; that, taking that portion of the road, the certificate which declared the building line to be more than 50 ft. back from the road was wrong, and ought to be upset; and that the building line was, as a matter of fact, up to the pavement.

On behalf of the London County Council it was contended that there was a well-defined line in the nature of a crescent formed by the houses, College Villas, 3 to 7, and the front of New College, and, therefore, that the superintending architect's certificate was correct.

Some discussion ensued as to whether the parties could not agree on the line to which buildings, proposed to be put up on part of the grounds of North-court adjoining New College, should be erected.

Eventually, it was agreed on behalf of the appellant that he should put a fresh proposition before the County Council for its consideration.

The Tribunal intimated that they had heard only one part of the case, and they were not, at present, in a position to say whether the line

was, in fact, more than 50 ft. back from the road, or whether the alternative might not be that there was no general line at all in that part of the road.

On this, the case was adjourned generally.

OBITUARY.

Mr. J. BOWER.—Mr. James Bower M.Inst.C.E., Borough Engineer of Gateshead, died recently at his residence, 8, Vernon parade. He had held the position of Borough Engineer for thirty-five years. In his earlier life he was associated with the Great Northern Railway, and, after setting out a part of the line near Peterborough, became chief assistant engineer to the Company in 1856. In 1861 he superintended the laying of a line into Liverpool, and was afterwards resident engineer on the line between Grantham and Lincoln. He was, in 1868, an inspecting engineer on the Irish Railway Commission, and afterwards went to Gateshead where his chief work was the designing and laying out of the sewerage scheme of the town.

GENERAL BUILDING NEWS.

CLERGY HOUSE, SMALL HEATH, BIRMINGHAM.—The new clergy house, which has been erected adjoining St. Aidan's Church, Herbert-road, Small Heath, for the accommodation of the clergy engaged in the work of the parish, was formally blessed on the 12th inst. by the Bishop of Worcester. The building is three stories high, and is built of red brick with freestone dressings. Mr. Arthur Dixon is the architect, and the total cost will be about 1,600l.

ST. PETER'S CHURCH, MANEY, SUTTON COLDFIELD.—The foundation-stone of St. Peter's Church, Maney, has just been laid. The new church is being erected to the designs of Messrs. Cossins, Peacock, and Bewlay, by Mr. T. Elvins, of Soho-hill. The site is at the corner of Maney Hill-road. The complete designs provide for a tower at the west end, but for the present the erection of this will be postponed. The nave will consist of five bays, 34 ft. long, but at present only four are to be built. The church will have a total seating capacity of 570, exclusive of choir, but the portion to be now built provides for only 402. The site has been purchased at a cost of 850l., and the building contract amounts to 5,252l. 10s., including all internal fittings, heating, and lighting, but excluding the tower and one bay of nave and aisles. The total cost of that portion of the church now in course of erection, it is estimated, will reach 6,500l.

EXTENSION OF THE PUBLIC LIBRARY, STOKES NEWINGTON.—The reopening of the Stokes Newington Public Library, after having undergone alterations and additions, took place recently. In the extended building, the public rooms are on the main floor, and comprise the reading-room, having an area of 2,352 ft.; reference library, with an area of 1,460 ft.; lending library (including borrowers' lobby), 2,500 ft.; children's library (with separate entrance), 850 ft.; lecture hall (exclusive of platform and retiring-rooms), 1,800 ft.; the directory lobby, and also librarians' office. The committee-room and staff-room are on the first floor. The work was carried out from the plans of Mr. S. G. Goss, architect.

PRIMITIVE METHODIST CHURCH, MORPETH.—The memorial stones of the new Primitive Methodist church, which is being erected in Howard-terrace, Morpeth, were laid a short time ago. The new church will be built on a site of about 900 sq. yds. The formation of the ground being below the street level advantage has been taken to obtain a school room to seat 250 on the lower floor, which is practically level with the surface of ground. The church will be approached from the street by a flight of steps, and at the entrance to the church there is a lobby with double swing doors. The church will have accommodation for 350 persons. At the rear will be minister's and stewards' vestries, connected with the school by a separate flight of stairs. The frontage to Howard-terrace is to be built of rock-faced blockers, and the sides and back with roughly-scraped rubble, sneek-walced. The interior woodwork for seats, rostrum, dado cladding, etc., is to be carried out in pitch-pine and the remainder in selected redwood. The heating is to be by hot water on the low-pressure system, with radiators placed at the entrances and other portions of the building where extra warmth is required. The foul air will be extracted by galvanised sheet-iron tubes fixed in openings above the ceiling, and carried off by an automatic rock-wood fixed on the ridge. Fresh air will be admitted through Tobin's tubes fixed in the exterior walls, assisted by hoppers

ventilators in the windows. The premises are designed in the Perpendicular style, and the architect for the building is Mr. F. Walton Taylor, of Newcastle, whose designs were selected in competition. The architects are Mr. Thos. A. Turnbull, of Rowlands Hill, the following firms being responsible for the sub-contracts.—Mr. John Hewitson, later; Mr. E. Byles, plumber; and Messrs. Jackson Bros., painters and glaziers.

NEW WESLEYAN CHAPEL, LOW MOOR, YORKSHIRE.—The memorial stones of a new Wesleyan Methodist chapel, which is being erected at Low Moor, near Bradford, were laid recently. The building has been designed by Messrs. W. J. Morley and Son, architects, of Bradford, with a tower rising to a height of 30 ft., and surmounted by an octagonal dome. The structure will consist of nave, transepts, choir-stalls, and communion table. Accommodation will be provided for 776 worshippers, 439 of the seats being on the ground floor, and 304 in the gallery, which occupies three sides of the chapel. The choir seats are placed in front of the organ, and are raised above the rostrum. There are vestries for the minister and choir, and two class-rooms. The gallery is reached by four staircases. The vestibule will be tiled with marble mosaic. The woodwork of the interior will be pitch-pine, and the ceiling of fibrous plaster with ornamental panelled work, and the windows will be filled with tinted ornamental leaded lights. Alterations and additions to the school premises have also been undertaken, and these include an infants' room and four new class-rooms, three of which may be thrown into the large school-room on the first floor. A communicating corridor is to be made between the chapel and the school on both floors. The various contracts have been let for £3,925.

SCHOOL BUILDINGS AT BRENTFORD.—The Middlesex County Council on Thursday of last week appointed Mr. Nowell Parr architect for a proposed manual training and cookery centre at the Ealing-road Council School, Brentford, and for the erection of two additional class-rooms, each to accommodate sixty children.

THE JEWS' FREE SCHOOL, SPITALFIELDS.—The Jews' Free School, Bell-lane, Spitalfields, founded on modest lines originally in 1817, has gradually risen till it forms certainly the largest public elementary school in the Kingdom, and probably in the whole world. No fee is admitted, but the accommodation is 2,200 boys, and 1,300 girls, requiring a staff, formed of the headmaster, vice-master, head-mistress, vice-mistress, seventy-five certificated teachers, nineteen pupil teachers and probationers, three assistant teachers for needle-work, and special instructors for Hebrew, science and art, drawing, military drill, gymnastics, instrumental music and cookery. Teachers' salaries alone absorb 12,144. The design for the present building was abandoned because two portions of the school are of comparatively recent date, and the scheme could not be carried out without the whole of the children being removed during the rebuilding. The present scheme, therefore, follows very much the lines of the existing buildings, giving greater space, more suitable sizes for class-rooms, more convenience generally, and an additional wing on the southern side. It will thus be seen that from the architectural point of view, the peculiarity is that two-thirds of the school will be entirely rebuilt without the education being interrupted for a day. The contractor is Mr. J. Carmichael; the clerk of works, Mr. Murrell; and the architect, Mr. Robson. Surrounded as the building is by warehouses or other high buildings, there is little attempt at architectural display. The treatment is of red brick, with stone-coloured terra-cotta for dressings; tall-glazed bricks are used for dados, and white glazed bricks very extensively in the staircases, latrines, and covered playgrounds. Practically the whole building is raised in the air so as to give the greatest possible playground space. The foundation-stone was laid by Lord Rothschild on Wednesday last.

SUNDAY SCHOOL, STEETON, YORKSHIRE.—On the 20th ult. the memorial stones were laid of the new Primitive Methodist Sunday school, at Steeton. The school is being built to the plans of Messrs. Moore and Crabtree, architects, Keighley, and will include an assembly-room, capable of holding 230 scholars, and also class-room accommodation. The estimated cost is 650*l*.

NEW CHURCH ROOMS, LLANBRADACH, WALES.—The opening of All Saints' rooms at Llanbradach, took place recently. The new building consists of a hall providing accommodation for 500 people on the ground floor, with a concert hall on the upper floor. Mr. E. M. Bruce Vaughan, of Cardiff, was the architect for the work.

NEW THEATRES IN LONDON.—The directors of the Palace Theatre, in Cambridge-circus, have secured a site in Tottenham Court-road for the erection of a new theatre and music-hall to accommodate an audience of about 4,000 persons. The ground lies at the corner of Great Russell-street, and the plans and designs will be prepared by Mr. W. G. R. Sprague.—For the new Jewish theatre in the East End of the town, Mr. Bertie Crewe has been appointed architect, and building operations will be begun in August next by Mr. A. Davis, who is also chairman of the company of promoters. The site is in Commercial-road, at the corner of Myrtle-street, and the theatre—to be called the Orient—is intended for the performance of dramas in the Yiddish tongue. The house will contain room for 2,000 persons, and the cost is estimated at 45,000*l*.

TOWN HALL, JARROW.—The new Municipal buildings and county court, at Jarrow, have just been opened. The premises occupy a central site in Grange-road and Wylam-street, and where the small Corporation offices formerly stood. The principal entrance is in Grange-road, and through an oak-panelled vestibule, in which the foundation-stone is exposed, the main hall and staircase are reached. The latter is of marble, with oak paneling and pilasters, and a central corridor on both ground and first floors traverses the entire building. There are terrazzo floors, and the walls have enamelled tiled dados. The Council chamber and committee-rooms are on the first floor front, and adjacent are the Mayor's parlour and the councillors' cloak-room. At the west end of the chamber is the Mayor's dais; the councillors' seats are arranged in horse-shoe form, and in the centre is accommodation for the town clerk and officials. The fittings of the chamber are in fumed oak and red morocco. At the opposite end to the mayoral dais is a gallery for the public. The fittings of the chamber are at present filled with leaded glass. The Corporation officials are all housed on the ground floor. The county court is on the first floor, and is reached by a separate entrance and staircase in Wylam-street. The Registrar's offices are on the ground floor, and of easy access to the public. In round figures the cost of erecting the structure was 10,000*l*., and the furnishings amounted to 2,000*l*.. Mr. J. C. Nichol, of South Shields, was the contractor, and the whole of the work has been carried out from designs prepared by Mr. Fred Renoldson, architect, of South Shields. Mr. Jas. Grieve was clerk of works. Messrs. Dinning and Cooke, Newcastle, supplied the heating apparatus; Messrs. Emley and Sons, the marble and mosaic decoration; Messrs. Brown and Hughes, the wood mantelpieces; Mr. W. Scott, the telephones; Mr. W. Cowper, the office fittings; Messrs. Gillow and Co., Lancaster, the Council chamber furniture; and the painting and decorating was done by Mr. John Dixon.

LAMBETH TOWN HALL.—The Borough Council of Lambeth has rejected a recommendation by the General Purposes Committee that they should visit provincial town halls so that they might, when drawing up the specification and list of requirements, be in possession of the latest arrangements for such buildings. The loan of 25,025*l*. for the purchase of the site has been completed with the Prudential Assurance Company.

MUNICIPAL BUILDINGS, BOSTON.—The municipal buildings, which have been erected in West-street, Boston, have been opened by the Mayor (Alderman Joseph Cooke). On the ground floor are the rooms and offices of the town clerk, medical officer, sanitary inspector, and rate collectors. On the same floor, but reached by another entrance, are the police offices, the fire station, and police court and magistrates' room. The library and public reading-room and the School of Art are on the first floor. The steps of the staircase leading up are of artificial stone. The staircases are daisied with old gold tiles. They have windows of stained glass, displaying the triple crowns and ram on a woolpack. The supporting arches on the ground and first floor have enriched architraves, with impost mouldings to the piers. The public library is about 50 ft. square, lighted by eight windows overlooking West-street, whilst at the back there is another window. The School of Art comprises three rooms. The first and largest one is lighted by six windows. The second apartment is the painting-room, and further on is the art master's private room. Altogether the School of Art is 56 ft. by 20 ft. The residence of the Chief Constable is on this floor, over the police offices and cells. Entrance to the residence is obtained by a private staircase from the west end of the buildings. The dining-room is 20 ft. by 14 ft., drawing-room, 14 ft. by 16 ft. There is a kitchen, 14 ft.

square, scullery, and other offices. The Council Chamber occupies the south-east angle of the buildings. The dimensions of the room are 35 ft. by 25 ft. There are seven stained and painted windows. Adjoining the Council Chamber is the committee-room, and here are also councillors' cloakroom, lavatory, and other offices. The total cost of the building is about 20,000*l*. The architect was Mr. James Rowell, and the contractors were Messrs. S. Sherwin and Son, Boston.

IMPROVEMENTS TO THE WORKHOUSE AND INFIRMARY, CROYDON.—At a recent meeting of the Croydon Board of Guardians, the report of the Special Committee, appointed by the Board to consider the subject of additional accommodation required at the workhouse and infirmary, was submitted. The report recommends that Mr. J. Hatchard Smith, architect, be instructed to prepare an amended design, and the present estimated cost of 6,627*l*. to be modified. The report was adopted.

BLACKHEATH AND CHARLTON COTTAGE HOSPITAL.—The opening of the new wing erected for the benefit of the out-patients of the Blackheath and Charlton Cottage Hospital, in Shooters' Hill-road, took place recently. The new building, which consists of a waiting-room for the patients, two consulting-rooms, a dressing-room, and a dispensary, has been erected at a cost of over 1,000*l*. from plans prepared by Mr. E. R. Robson, architect, of Blackheath, the contractors being Messrs. Garrett and Co.

TUNBRIDGE WELLS HOSPITAL.—A bazaar has just been held in aid of the building fund for the new wings by which Tunbridge Wells General Hospital has been extended. The new wings, of red brick, with white stone facings, are situated partly in Grosvenor-road, and round the corner a considerable distance along Goods Station-road. From the old General Hospital, close by, the premises are semi-detached. The estimated total cost of the extension is 22,000*l*. Mr. Percy Adams is the architect, and Messrs. Jarvis and Son, of Tunbridge Wells, the builders. The main entrance to the hospital will still be in the Grosvenor-road, nearly opposite St. Augustine's Roman Catholic Church. The male ward holds twenty-four beds, and over this is the female ward of the same size, while there are corridors 30 ft. long. The wards are 100 ft. long by 27 ft. wide, and there are twelve windows on either side, with a verandah on the Goods Station-road side. The floors, covered with linoleum, are concrete. The bath-rooms and lavatories at the end of the wards have glazed walls and terrazzo paving. There is a special ward for convalescents. The staircases are fireproof, and there are single bed wards on both floors. The operating theatre is on the ground floor, and there are large waiting-rooms. The out-patients' department is entered from Goods Station-road, where close by is the house surgeon's consulting-room, beyond the porter's lodge. The large waiting-room is 44 ft. by 26 ft., and on either side are consulting and examination rooms, further on being the large dispensary section. There is also a children's ward, 44 ft. long by 26 ft. wide, and above is the isolation ward. There are also other rooms and offices for the Secretary, Governors, etc., and a casualty-room beyond the courtyard and gardens, the entrance to which is on the Goods Station-road side. The hospital will be heated with hot-water pipes, and lighted with electricity throughout.

FIRE STATION, MILE END.—Mr. Edward Smith, Chairman of the Fire Brigade Committee of the London County Council, laid the memorial stone recently of a new fire station, in course of erection, in Burdett-road. The station, which is being built by the Works Department of the Council, and the estimated cost of which is 7,674*l*., was commenced in February last. It will supersede the street station in Baggally-street, and consist of an appliance-room, 13 ft. wide at front, with an average depth of 40 ft., a watch-room, 14 ft. by 9 ft. 6 in., a stable, a recreation-room, 24 ft. by 19 ft. 4 in., and store. In the upper rooms will be accommodation for six married men and their families, and the basement will contain a laundry, stokers, workshop, stores, etc. The station is being erected under the supervision of Mr. W. E. Riley, the Council's superintendent architect.

ROYAL VICTORIA HOSPITAL, DUNDEE.—At a meeting of the Works Committee of the Dundee Royal Victoria Hospital held recently, the meeting considered the propriety of extending the buildings, and plans, by which the required accommodation would be provided, were submitted by Mr. James Finlay, architect, at an estimated cost of 6,000*l*. The architect was instructed to proceed with the introduction of an electric fan for the thorough ventilation of the present cancer ward.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, PETERBOROUGH CATHEDRAL.—A painted glass window, erected to the memory of Canon Twells, was unveiled on Saturday last in Peterborough Cathedral. It is intended to record his characteristics as a preacher, and a writer of well-known hymns. For the latter purpose David is taken as a typical personage; for the former, St. John the Baptist and St. Paul. Each of these saints, as represented in the window, is accompanied by subjects (pictures) illustrating events in his life. Thus, under King David is his playing and singing before Saul and Christ. Under St. John the Baptist is the Baptism of our Lord and the Visitation to St. Elizabeth. Beneath St. Paul is his preaching at Athens and the miracle at Miletus. In the tracery are the four Doctors of the Church—emblems of Christian teaching. The whole window is designed in the style of the architectural stonework. The inscription is engraved on a brass plate. The work was designed and executed by Messrs. Lavers and Westlake, of London.

APPOINTMENTS.

KING'S COLLEGE.—Mr. Arthur Stratton, A.R.I.B.A., has been appointed Lecturer in the Architectural Division of King's College, London, in succession to Mr. C. H. Reilly, who now occupies the Chair of Architecture in the Liverpool University. Mr. Ronald P. Jones, M.A., has been appointed Assistant Lecturer with Mr. Stratton at King's College. The Department, which was formerly included in the Faculty of Science, has recently been reorganised and transferred to the Faculty of Arts.

RIPON.—At a special meeting of the Ripon City Council on the 27th ult. Mr. William Mitchell, of Longridge, was appointed City Surveyor and Sanitary Inspector. Mr. Mitchell has, for six years, been City Surveyor and Sanitary Inspector at Longridge. There were 130 applicants for the post, six of whom had been selected to appear before the Council—viz., Messrs. D. Hinchcliffe, Northallerton; W. Mitchell, Longridge; T. Collins, Bishop Auckland; J. F. Day, Kettering; J. R. Lupton, Lancaster; and J. W. Constantine, Rochdale.

BODMIN.—Bodmin Town Council received eighteen applications for the combined appointments of Borough Surveyor and Inspector of Nuisances. Mr. Buscombe was elected by nine votes to Mr. R. Crosbie's four.

SANITARY AND ENGINEERING NEWS.

Huddersfield Sewerage Disposal.—At the Huddersfield Town Hall, on the 23rd ult., Mr. H. P. Bulnois and Mr. H. T. Bulstrode, Inspectors of the Local Government Board, inquired into an application made by the Corporation for sanction to borrow 135,000*l.* in connexion with proposed additional works of sewerage disposal. Among those present were the Town Clerk (Mr. J. H. Field), and Mr. K. F. Campbell (the Borough Engineer, who has prepared the scheme). The Town Clerk said that the present sewerage works at Deighton, begun in 1839 and finished in 1853, cost 101,000*l.*, and of this amount about 5,000*l.* had been repaid. About fifty-six acres of land on the south side of the river Colne had been purchased for this scheme. Mr. K. F. Campbell stated that, shortly after completion, the existing works, having filtration tanks with a total capacity of 1,250,000 gallons, were found altogether inadequate to deal with the total flow of sewage. The small results arising from chemical precipitation by ferrous and filtration through polarite led to a thorough investigation of the sewerage disposal question in relation to the particular conditions prevailing at Huddersfield. Owing to the billy nature of the district, and the fact that suitable land could not be obtained for the purposes of the Corporation, artificial filtration was the only method that could be adopted. The scheme provides for the purification of the sewage by sedimentation and distribution over filtering areas. The area of the borough is 11,854 acres, and the population about 100,000. The drainage of the whole borough, excepting the small district of Outlane, will be dealt with at the existing and proposed works. On the average the volume of sewage is estimated at 7,500,000 gallons, or seventy-five gallons per head; the dry weather flow, 5,500,000 gallons, or fifty-five gallons per head. This excessive flow arises from the admission of trade waste from 104 factories. The area of the land of the existing works is 64 acres, and there are about 28 acres available for further extension. The tank effluent will be conveyed from the septic tanks at Deighton to beds at Cooper Bridge by means of a culvert a mile and one-eighth long, with a maximum carrying capacity of

44,000,000 gallons a day. Here there will be sixteen circular trickling beds, constructed upon a layer of concrete or asphalt, with a total area of 115 acres, and an average depth of 7 ft. Electrically-driven distributors will convey the sewage on to the trickling beds evenly in all conditions of weather, and the flow can be regulated from three-quarters to one and a quarter million gallons per acre. The distributing apparatus will be controlled automatically from a main building. Sufficient land will remain for other beds to deal with 4,000,000 gallons of sewage, and 26 acres to utilise for under drainage in case of flood. By the suggested method, and abandoning chemical precipitation, a saving of 1,800*l.* per annum will be effected, and, in addition, several annual charges. A new sewer in connexion with this scheme will, it is estimated, at current prices, cost 11,763*l.*, new precipitation tanks, 10,673*l.*, storm beds, 10,319*l.*, filter beds, effluent channels, distributors, and outfall sewer, 52,114*l.*, land, including minerals, surveyors' and law expenses, 20,500*l.*, making, with several four-figure items, 135,000*l.*

SEWAGE WORKS, DRIGHLINGTON, YORKSHIRE.—The new sewage works at Drighlington were opened on the 23rd ult. The construction of the main outfall sewer, and of the works at the sewage disposal field, etc., is being carried out by Messrs. Ward and Teley, of Bradford, and the contract for the sewerage of the higher districts is in the hands of Messrs. Greaves and Wheaton, of Calverley. The whole works have been designed by Messrs. John Waugh and Sons, engineers, of Bradford, and Mr. G. B. Waugh has superintended the construction as works engineer, assisted by Mr. H. S. Rusforth.

NEW WATERWORKS, STREET, SOMERSET.—The new waterworks, which have been erected at Street, were recently completed and opened. Messrs. Wright and Son, of Taunton, were the contractors for the whole work, with the exception of the high-level reservoir, which was carried out by Mr. F. Huish, Street. Mr. A. P. I. Cotterell, M.Inst.C.E., was the engineer of the scheme, and the cost was 26,000*l.*

FOREIGN.

GERMANY.—Herr Hans Griesbach, architect, died at Berlin on May 11th.—A new theatre is to be built at Berlin, from the plans of Herr Hentschel.—MM. Fellner and Helmer have undertaken the reconstruction of the theatre at Bielitz. A new church is to be built at Königshütte, from the plans of Professor Schmitz.—A new bridge is to be built near Munich, consisting of two arches, each 70 metres wide.—The asylum at Bremen by Messrs. Weber, Ohnesorge, and Wagner has been completed.—The Evangelical Institution, for the training of nurses at Lichterfelde, near Berlin, is completed; the building was designed by Herr Kleine.

AUSTRIA.—The architect, Herr Hermann Wehrenfennig, died at Vienna on May 23, in his fifty-third year.—A new Infantry Cadet School is to be built at Enns.—A fountain is in course of construction at Innsbruck, designed by the sculptor, Herr Baumgarten.

SWITZERLAND.—The Society of Swiss Artists, Sculptors, and Architects held its annual general meeting, on June 12, at Neuenburg, when Herr Gustav Jeanneret took the chair. Herr Max Girardet, of Bern, was elected secretary to the National Exhibition of Arts at Lausanne, and expressed the hope that the Swiss people would support the Society in its efforts to preserve the characteristic features of their national art.

THE RAPID TRANSIT SUBWAY, NEW YORK.—Although the promise made that the New York subway would be open for traffic on January 1 this year has not been fulfilled, it seems likely that the works will be completed in the course of two or three months. In Manhattan Island all the tracks and electric cables are laid, the greater part of the signalling plant has been installed, and many of the passenger stations are quite ready for use. The contractors are making strenuous efforts to complete the equipment of the power-house, of which the building measures 690 ft. by 200 ft., and the maximum capacity of the engines will be 132,000 h.p. This will be the largest power-station in the world, and the complete subway system will be an inestimable boon to the inhabitants and trading classes of New York.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The title of the "Non-Flammable Wood and Fabrics Company, Ltd.," of Townmead-road, Fulham, has been changed to "The Fire-Resisting Corporation, Ltd."

METROPOLITAN WATER BOARD.—The ordinary meeting of the Metropolitan Water Board was held at the offices of the Metropolitan

Asylums Board on the 24th ult. under the chairmanship of Mr. B. M. Bouchard. The chairman drew the attention of the Board to the fact that that was the appointed day under the Act, that, with one exception, the water undertakings had that day been vested in the Board, and that they had assumed the responsibility for supplying six and a quarter millions of people with water. The exception was that of the New River Company, who had applied to the Local Government Board for a postponement. The Local Government Board had, on consideration of the application, and in view of the appeal now pending in the House of Lords, postponed the vesting in the New River case until July 25.—The Works Committee reported that they had received thirty-seven applications for the position of chief engineer to the Board, at a salary of 2,500*l.* a year, and they selected three candidates for submission to the Board—namely, Mr. William B. Bryan, Chief Engineer to the East London Water Works Company; Mr. Ernest Collins, the Distributing Engineer of the New River Company; and Mr. E. E. Tuttle, Chief Engineer of West Middlesex Water Works Company. The committee recommended that Mr. W. B. Bryan be appointed at a salary of 2,500*l.*, and that he should also receive, while in the Board's employ, in addition to his salary, such further sum in lieu of pension during the term of his service with the Board as would, with the 2,500*l.*, make an annual sum payable of not less than 3,750*l.* It appeared that under his old appointment Mr. Bryan had been allowed to engage in private practice, but this he proposed to wind up at the end of the year, and only to retain a consulting engineership to the City of Nottingham during the construction of an undertaking there. Ultimately, Mr. Bryan was appointed on a division by thirty-three votes to fourteen, an amendment to give the appointment to Mr. Collins having been defeated.

THE SURVEYORS' INSTITUTION: SPECIAL CERTIFICATE EXAMINATION.—The following candidates have passed the recent Special Certificate Examinations, now held triennially, in Forestry:—Forsyth, T. Maw, F. H. G. Osmond, Smith, Henry Pritchard, J. Ashton Sawyer, J. Clulow Thompson, Martin L. Wheldon. The first "Daniel Watney" Prize, to the value of 10*l.*, was awarded to Henry Pritchard, and the second "Daniel Watney" Prize, value 5*l.*, to J. Ashton Sawyer. The examiners on this occasion were Mr. Daniel Watney, Dr. W. Somerville, Mr. G. Marshall, and Professor C. E. Curtis. The following have passed the Special Certificate Examination in Sanitary Science:—Hubert C. Sands, Henry P. Ward. The examiners were Professor H. Robinson, Mr. H. P. Boulnois, Mr. C. John Mann, and Mr. R. C. Gleib.

DISBURSEMENT BY ADVERTISEMENTS.—In addition to the Metropolitan Borough Councils which have already been reported in the *Builder* as having taken action upon the circular-letter from the Royal Institute of British Architects on the abuse of buildings by advertisement hoardings, the following have considered the matter:—Lambeth Borough Council are of opinion that it would be well if local authorities had some power to deal with the nature and extent of advertisements which are now exhibited in increasing size and number, and have adopted this motion:—"That the London County Council be requested to include in a General Powers Bill a clause giving the Metropolitan Borough Councils power to deal with poster advertisements." Greenwich Borough Council have agreed:—"That the London County Council be asked to take such steps as may be proper for obtaining Parliamentary powers in the direction indicated by the Institute." Southwark Borough Council passed the following motion:—"That representation be made to the London County Council to embody a clause in their next General Powers Bill to give effect to the suggestion that the public authorities should have power to regulate the display of advertisements contained in the letter from the Royal Institute of British Architects." Marylebone Borough Council, while sympathising with the views of the Institute, are not at present prepared to take any action. The Metropolitan Borough Council considered that the matter is one more for the London County Council to deal with. Hammersmith Borough Council has decided to take no action, and Shoreditch Borough Council has, upon the recommendation of the committee to which the letter was referred, simply marked the communication "Received."

PROFESSORSHIP.—Mr. Charles Waldstein, Litt.D., Fellow of King's College, Cambridge, has been appointed to succeed Sir W. Martin Conway as Slade Professor of Fine Art. Dr. Waldstein, who occupied the chair during the previous periods of three years in 1895-1901, is University Reader in Classical Archaeology. He is a native of New York.

and a prominent member of the American Archaeological School at Athens; he has carried out excavations on the site of the ancient Plataea, together with other important work in connexion with that school.

THE SANITARY INSTITUTE CONGRESS.—The Sanitary Institute preliminary programme of the Twenty-second Congress, to be held in Glasgow, from July 25 to 30, has now been issued. The President of the Congress is the Right. Hon. Lord Blythswood, Lord Lieutenant of Renfrewshire. Sir Richard Douglas Powell will deliver the lecture to the Congress on "The Prevention of Consumption." Excursions to places of interest in connexion with Sanitation, Conversation, afternoon and evening cruises, and other entertainments will be arranged for those attending the Congress. Two hundred and fifty authorities, including several County Councils and County Boroughs, have already appointed delegates to the Congress, and as there are also over 3,300 members and associates in the Institute, there will probably be a large attendance, in addition to the local members of the Congress. In connexion with the Congress, a Health Exhibition of Apparatus and Appliances, relating to health and domestic use, will be held as a practical illustration of the application and carrying out of the principles and methods discussed at the meetings. Among the popular lectures to be given in the exhibition will be one on "Healthy Houses," by Professor H. R. Kenwood, M.D. The Congress will include three Section meetings for two days each, dealing with (1) Sanitary Science and Preventive Medicine, presided over by Professor J. Glaister; (2) Engineering and Architecture, presided over by Professor Henry Robinson; (3) Physics, Chemistry, and Biology, presided over by Professor Frank Clowes. Among the subjects to be brought forward for discussion are included:—"Domestic Sanitary Engineering in West of Scotland"; "Planning and Construction of Parochial Institutions"; "Ventilation"; "The Construction of Hospitals"; "Sanitary Fittings"; "The Construction of House Drains"; "Purification of Trade Effluents"; "Sewage Disposal"; "Standards of Purity for Sewage Effluents"; "The Abatement of the Smoke Nuisance"; "The Municipality and the Housing of the Poor"; "The Municipality and the Plumber"; "Sanitary Local Authorities and Administration of Public Health"; "Trade Diseases and their Prevention"; "The Conditions of Home Work in Various Trades"; "Ventilation in Factories and Workshops"; "The Mortality of Occupations"; "Certification of Houses by Sanitary Authorities"; "Pig Styes"; "Road Maintenance"; "Amendment and Consolidation of the Public Health Acts"; "Rural Inspection"; "School Hygiene and Ventilation," etc., etc.

STEVENSON MEMORIAL, EDINBURGH.—The memorial tablet, erected in St. Giles' Cathedral, Edinburgh, to the memory of Robert Louis Stevenson, was unveiled on the 27th ult. by Lord Rosebery. The tablet, which is the work of Mr. Augustus Saint-Gaudens, an American sculptor, has been placed on the west wall of the Moray aisle.

EGYPT EXPLORATION FUND.—The latest set of antiquities found at Deir el Bahri and Ebnasya, together with the Papyri and antiquities found at Oxyrhynchus, will be on view at University College, Gower-street, from July 4 to 30.

Legal.

THE LONDON COUNTY COUNCIL AND THE TRIBUNAL OF APPEAL.

THE case of *in re* the London Building Act, 1894, and in the matter of the London County Council, came before a Divisional Court of King's Bench, composed of Justices Wills and Kennedy, on June 23, on a special case stated by the Tribunal of Appeal at the instance of the London County Council.

Mr. Bailhache appeared for the appellants (the London County Council), and Mr. Bartley Dennis for the respondent, Mr. Robert Roy.

In the temporary absence of Mr. Bailhache, Mr. Dennis stated that this was an appeal by the London County Council against a decision of a new body, called the Tribunal of Appeal, under the London Building Act. It was the first case which had ever been brought in this court on this matter. The learned counsel said he might tell the court how the Tribunal of Appeal came to be constituted. Under the Act of 1855 there was no building line fixed by anybody in London, but if, in the opinion of anybody, a man built a house beyond the general building line, it was a question for a jury. Then, under the Metropolitan Management Act, 1862, an official appointed, called the superintending architect, and it

gave him power to fix the building line, and the House of Lords held that his decision was absolutely final and binding on everybody. This was considered very hard lines, as the superintending architect was the official of the London County Council, and if that body wanted to widen streets it could bring pressure to bear on him. Now the appellate Tribunal was an independent body, one member being nominated by the Board of Trade, one by the Institute of British Architects, and one by the Surveyors' Institution, and these gentlemen sat on appeal on the line fixed by the superintending architect. In the present case the superintending architect fixed a certain building line, and his client, being dissatisfied, appealed from his decision to the Tribunal of Appeal, and that body varied the line, and the County Council, not being satisfied, now appealed on two points of law.

At this stage Mr. Bailhache came into court, and read the special case, which stated that, on September 5, 1903, Mr. Chas. Botterill, as agent for Robert Roy, the owner of houses, Nos. 689 to 697, Fulham-road, inclusive, desiring to build upon a building site partly occupied by these houses, by notice in writing of that date, applied to the superintending architect of Metropolitan buildings, under section 22 of the London Building Act, 1894, to define the general line of buildings in respect of the land occupied by the said houses. The superintending architect gave notice to all persons mentioned in section 24 of the Act, and, having heard all the persons who attended before him, issued his certificate on October 3, 1903, with the plan annexed. From such plan it appeared that he did not confine himself to defining the general line of buildings in respect of the land occupied by the said houses, but, by his certificate, he defined the general line of buildings on the southern side of Fulham-road, between Munster-road and Landridge-road. Mr. Chas. Botterill appealed from the said certificate to the Tribunal of Appeal, and the Tribunal of Appeal on November 10, 1903, having viewed the building site in question, and the locality, and having heard all the parties referred to in the order of the Tribunal of Appeal, issued their order, dated November 10, 1903.

Paragraph 5 of the special case stated that Fulham-road was a public highway, the buildings, Nos. 907 to 921, Fulham-road, inclusive, being built up to the highway. The shops shown on the plan in the Fulham-road, between the corner of Munster-road and No. 651, Fulham-road, were, at the time the Tribunal of Appeal made their order, built to an advanced line on the site formerly occupied by No. 47, Munster-road, with the consent of the London County Council, dated March 24, 1903, and subject to the conditions of such consent. The case further stated that the County Council contended that the Tribunal of Appeal had no power to make their order on the following grounds:—

(a) The line so defined, both from Landridge-road to the point marked *b*, on the plan marked "B," purported to define the general line of buildings for a portion of Fulham-road, in respect whereof the superintending architect had not defined any general line of buildings.

(b) The line defined by the Tribunal of Appeal which varied the said certificate of the superintending architect, as appeared by the plan marked "B" was not a general line of buildings within the meaning of the London Building Act, 1894.

The case further stated that the Council also contended that there was no power in the Tribunal of Appeal to order (in the absence of consent) a lump sum for costs. Appended is the full text of the award of the Tribunal of Appeal (Messrs. Penfold, Hudson and Gruning):—

"Whereas, on the 5th day of October, 1903, the superintending architect of Metropolitan buildings made his certificate under the provisions of section 22 of the London Building Act, 1894, by which he certified that the main fronts of the buildings, tinted pink on the plan annexed to his certificate, and signed by him, form the general line of buildings on the southern side of Fulham-road, Fulham, between Munster and Landridge-roads, in which part of Fulham he further certified the building site in question, coloured blue on the said plan, thereto annexed, to be situate, and by which he further certified, in pursuance of the provisions of the 25th section of the said Act, that the said building site in question is situate in the road or street called Fulham-road, Fulham, and that such building site is also situate in the road or street called Landridge-road, as shown on the said plan, and whereas it appears to us, the above-named members of the Tribunal, that notice of the certificate, dated October 3, 1903, was duly given to all persons to whom, by the 24th section of the aforesaid Act, it is directed to be given. And whereas Mr.

Robert Roy, being the owner of the building site in reference to which the general line of buildings has been certified, deeming himself aggrieved by the said certificate, has appealed to us (by his agent, Mr. Chas. Botterill) as the Tribunal to which the said appeal is referred under the 25th section of the aforesaid Act. And whereas the said Mr. Robert Roy appeared before us by his agent on November 10, 1903, to prosecute the appeal. Now, we therefore, the said Tribunal, having viewed the building site in question, and the locality, and considered the said certificate, and having duly heard Mr. Chas. Botterill, surveyor, on behalf of the appellant, Mr. D. P. Andrews (of the Solicitors' Department of the London County Council), in support of the certificate of the superintending architect of Metropolitan buildings, Mr. R. M. Prescott, Town Clerk, on behalf of the Metropolitan Borough of Fulham, and all other persons interested who, deeming themselves aggrieved, have desired to be heard on the said appeal, and having also heard and considered the evidence adduced before us, do make and publish our decision herein as follows:—We do hereby allow the appeal and vary the certificate of the superintending architect of Metropolitan buildings, dated October 3, 1903, and decide and determine that the general line of buildings on the southern side of Fulham-road, Fulham, between the point marked *a* and the point marked *b* on the plan annexed to this order, is as defined on such plan by a strong green line. And, further, we order and direct that the respondents pay the sum of 10*l.* 10*s.* to the appellant as the costs of his appeal. In witness whereof the seal of the Tribunal is hereto affixed, in accordance with the resolution of the Tribunal of the 10th day of November, 1903. (Signed) J. W. Penfold, Chairman of the Tribunal, Chas. H. Love, Clerk of the Tribunal."

Mr. Bailhache said that their lordships would see that the superintending architect had himself only fixed the general line of buildings between Munster-road and Landridge-road, in which part of the Fulham-road he certified the building site in question to be situate. The Tribunal of Appeal had fixed a line for a much longer distance along the Fulham-road, extending considerably further to the right. He must satisfy their lordships that the Tribunal had gone wrong in point of law. It was no good for him to suggest that they had gone wrong on a question of fact. The general effect of sections 22 and 24 of the Act of 1894 was that the superintending architect defined on request—and was bound to do so—the general line of buildings. He might, if he liked, define a general line of buildings for the whole of the street. He might also, if he liked, define the line of buildings for part of a street, block, or row of houses. When he had made his certificate, notice of that certificate had to be given to all persons affected by it, including persons within 50 yds. on either side of the length of the two termini at the end of this line. Before 1890 the certificate of the superintending architect was final, and from it there was no appeal. When the County Council came into being the Tribunal of Appeal was constituted, and the Act of 1894 provided that there should be a right of appeal by all persons aggrieved by the architect's decision to the Tribunal of Appeal. The learned counsel then read section 27 of the Act of 1894, which provides, in effect, that the consent by the London County Council to the erection of a building or structure beyond the general line of buildings shall not be deemed to alter or affect in that, or in any other part of the street, the general line of buildings as existing at the time of the consent. Continuing, the learned counsel said that he challenged the line drawn by the Tribunal of Appeal in two respects. He challenged the line drawn to the right of Landridge-road to point "B" on the plan, on the ground that, in respect of that portion of the Fulham-road, the superintending architect had not defined any general line of building. It might be that it was a good line from "A" to Landridge-road, and bad from Landridge-road to "B." If he showed that it was bad from Landridge-road to "B," it was only bad to that extent. If the line were held to be a good line, the Tribunal of Appeal would have the power to be the original defining authority for the building line of a street or part of a street which had not been considered by the superintending architect. The Tribunal of Appeal were not the original defining authority at all.

Mr. Justice Kennedy said he thought, on this appeal, the court had nothing at all to do with the line beyond the Landridge-road.

Mr. Bailhache said he would leave that point, and then proceeded to argue that the Tribunal of Appeal had no right to alter, in

the way they did, the line fixed by the architect between Munster-road and Landridge-road. The learned counsel also submitted that the Tribunal of Appeal had no power to make the order as to costs they did make.

Mr. Bartley Dennis supported the decision of the Tribunal of Appeal. He said the superintending architect had only taken into consideration in defining the line one side of the street. The Tribunal of Appeal were not bound to any part of the street the superintending architect chose to select.

Mr. Justice Wills: The applicant did not ask for a building line to be settled between Munster-road and Landridge-road, but he only asked for it to be settled as for his own buildings?

Mr. Bartley Dennis said that was so. He submitted that the appeal on all points failed, and should be dismissed.

Mr. Justice Wills, in giving judgment, said that the case raised a question of considerable importance, and had given the court a certain amount of difficulty. The question to be decided was, whether the order of the Tribunal of Appeal varying that of the superintending architect was erroneous, and founded on some mistake in point of law, because, on a question of fact, there was no appeal. His lordship, having gone through the material sections of the Act of 1894, said that the question of where the general line of buildings ought to be drawn, was a question of fact which ought to be decided by taking into consideration the physical aspect of the street, the buildings in it, and its physical peculiarities. The appellant Tribunal had very wide powers to affirm, reverse, or vary any decision, and to make such order as might seem fit. The Tribunal of Appeal had a perfect right to say, in fixing the building line, it was a faire and better thing to take a greater length of the road than the superintending architect had done. He could see nothing which the Tribunal of Appeal had done which could possibly make him say that they had made any mistake in point of law. Such a matter as this was entrusted to a tribunal entirely qualified to decide it. So far as he could see there was nothing extravagant in what the Tribunal of Appeal had done. But whether it was so or not he did not hesitate to say that, so far as the Tribunal's consideration was concerned, it was a question of pure fact with which this court had no right to interfere. His lordship said that the only other point he had to deal with was whether the Tribunal of Appeal had power to make the order as to costs they did make. He considered they had power to order the unsuccessful party to pay to the successful party a lump sum for costs instead of leaving the costs to be taxed in the ordinary way. He thought the appeal should be dismissed with costs.

Mr. Justice Kennedy concurred.

Leave to appeal was granted.

DISPUTE UNDER A THEATRE BUILDING CONTRACT.

THE case of *in re the Arbitration Act, 1899*, and in the matter of an arbitration between Kirk and Randall and Sir Charles Wyndham, came before a Divisional Court of King's Bench, on June 27.

In this case the action of "Kirk and Randall v. Wyndham," and all other matters in dispute between the parties, were referred to the arbitration of an arbitrator, and the court appointed as arbitrator Mr. H. T. Steward, of 45, Parliament-street, Westminster. In the course of the reference a question of law arose, and the arbitrator, for his own guidance, in order to get the opinion of the High Court on the subject, stated the special case which now came on for argument.

The special case stated that plans and drawings, and a specification of works to be done, and materials to be used in the erection of a theatre at the corner of St. Martin's-court, in St. Martin's-lane, W.C., were prepared for and on behalf of Sir Charles Wyndham by Mr. W. G. R. Sprague, architect, of Fitzalan House, Arundel-street, Strand, and bills of quantities therefore were prepared by Mr. A. R. Henderson, surveyor, of 47, Pall Mall. Messrs. Kirk and Randall tendering for the works on June 21, 1901, the amount of their tender being 25,814*l.*, but such tender was not accepted by Sir Charles Wyndham. In August, 1901, Messrs. George Trollope and Sons commenced the works upon the site, and executed a large quantity of excavation. In October, 1901, Messrs. George Trollope and Sons were desirous of discontinuing the work, and Messrs. Kirk and Randall were invited by Mr. Sprague to undertake the completion of the work. In October and November, 1901, negotiations took place, and Messrs. Kirk and Randall offered to take over the work and

complete the building for the sum of 25,500*l.*, but ultimately agreed to reduce the price to 24,800*l.*, with the condition that no deduction be made for the work already done by Messrs. George Trollope and Sons. Articles of agreement were signed by Messrs. Kirk and Randall and Sir Charles Wyndham on November 26, 1901, whereby Messrs. Kirk and Randall agreed for the sum of 24,800*l.*, to execute, subject to the conditions on which in the schedule of the said agreement, the works shown on the drawings and described in the specification. On the same date Messrs. Kirk and Randall signed the specification referred to. The specification provided that the conditions of the contract would be those of the Royal Institute of British Architects.

The articles of agreement were those of the Royal Institute of British Architects. In the articles of agreement it was agreed, *inter alia*, as follows:—"Any reference in the said conditions to the bills of quantities shall not have the effect of constituting them part of this contract." The bills of quantities were referred to in the said conditions—viz. in conditions 3, 13, and 14. It was contended by counsel for Sir Charles Wyndham, and denied by counsel for Messrs. Kirk and Randall, that, upon the true construction of the documents, the bills of quantities formed part of the contract made between the parties. The question for the determination of the court was, whether such bills of quantities did or did not form part of the said contract.

On behalf of Sir Charles Wyndham it was now contended that, for the purpose of ascertaining the final sum due to the plaintiffs, after allowing for the omission of certain towers from the original designs, and for extras, it was necessary to incorporate these documents. If the bills of quantities were not to be part of the contract, it was urged that it would mean a difference of several thousands of pounds.

On behalf of the contractors it was said that the bills of quantities were not part of the contract for the purpose of effecting the basis of the lump sum agreed upon, but it was admitted that they might be referred to in order to price extras and omissions.

At the conclusion of the arguments of counsel, the Lord Chief Justice, in giving judgment, said he could not help thinking that the contention really raised on behalf of Sir Charles Wyndham before the arbitrator went to the extent that the lump sum could be opened up, and that in that way the bills of quantities were to form part of the contract, not for their proper purpose, but for the purpose of saying that it was not a contract for a lump sum at all. He was clear that this was a lump sum contract, however, and that the documents in question were wholly inadmissible for the purpose of turning the 24,800*l.* into some other figure. He expressed no opinion, however, as to what was a proper omission of a proper extra—that was a question for the arbitrator—and while he said that the bills of quantities formed no part of the contract in regard to the lump sum, when the clauses of the contract which contained the usual provision for extras and omissions came to be worked out, he said the documents therein referred to were these bills of quantities, and had to be taken into the contract directed. For the purposes of omissions and extras, therefore, the bills of quantities might be looked at, but not for the purpose of saying that the contract was for measure and value of the work.

Mr. Justice Kennedy agreed, and the case was accordingly remitted to the arbitrator with this direction.

Mr. W. English Harrison, K.C., and Mr. Clavell Salter, K.C., appeared for Messrs. Kirk and Randall, and Mr. Spencer-Bower, K.C., and Mr. Rose-Innes for Sir Charles Wyndham.

LIABILITY FOR PAVING, ETC., EXPENSES.

THE case of *in re Allen and Driscoll's contract*, dated July 22, 1903, and *in re the Vendor and Purchaser Act, 1874*, came before the Court of Appeal, composed of Lords Justices Vaughan Williams, Romer, and Cozens Hardy, on June 23, on the appeal of E. and F. Driscoll from the judgment of the late Mr. Justice Byrne in the Chancery Division.

In this case an order had been made in an action by the vendor for specific performance that the purchasers were, on or before September 29, 1903, to pay to the vendors 4,440*l.* in settlement of the purchase-money and interest due in respect of eleven leasehold houses at Acton, the vendors to recover the rents and pay all outgoings in respect thereof up to September 29, 1903. In February, 1903, the vendors received notice under the Public Health Act, 1875, to pave and make up the roadway in front of the

houses, and as the vendors did not comply with the notice, the District Council, on July 7, 1903, entered into an agreement with a contractor to execute the said works. The whole of the work was not completed until after September 23, but the Council made from time to time payments on account to the contractor. The question in the case was, whether the expenses of the works were to be paid by the vendors or the purchasers. The purchasers contended that the charge in favour of the Council upon the property for the expenses under the Act of 1875 took effect when the Council entered into the contract of July 7, which rendered them liable to the contractor. Mr. Justice Byrne held that the charge did not take effect until the completion of the works, and that the purchasers were liable to pay the amount. Hence the present appeal of the purchasers.

At the conclusion of the arguments of counsel for the appellants their lordships affirmed the decision of Mr. Justice Byrne, and dismissed the appeal with costs.

Mr. Cozens Hardy appeared for the appellants, and Mr. Norton, K.C., and Mr. Ashton Cross for the respondents.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

12,450 of 1903—G. SPENCER: *Folding Partitions for Dividing Rooms.*

The partition consists of parts or leaves which are hinged edgewise together, and on the bottom of the parts or leaves pulleys or castors are fixed for working on in opening or closing. On the top of some of the leaves is fixed a pin, with a roller working between plates or grooves, attached to a beam on the ceiling above.

15,138 of 1903.—EVERED and Co., LTD., and S. EVERED: *Hinged Casement and Fanlight Openers.*

In a fanlight or casement opener, consisting essentially of a screwed rod or arm pivoted to the fanlight, operated by a screw-box pulley, carried by a bracket on the fanlight frame or the reverse, the pivoting of the screw-box pulley carrying bracket directly to an angle or fixing plate, and arranging the opener at such a position with respect to the pivot or angled edge of the fanlight or casement, that a screwed rod or arm of short length only is necessary to effect the required opening and closing of the said fanlight or casement.

16,793 of 1903.—T. W. TWYFORD: *Water-Supply Fittings for Institution and other Baths, and the like.*

In hot and cold water-supply fittings for baths or the like, the employment, in conjunction with a single spindle operating both valves, and actuated by a loose or removable key, of a safety device for preventing the turning on of the hot water before the cold supply has been opened, the said device consisting of a spring or equivalent bolt or slide having a limited yielding movement, and arranged in the path of a lug or projection on the key, which is adapted to act upon the said bolt and force the same into a position in which it will constitute a positive stop for blocking the said key against further rotation, but will, nevertheless, admit of its withdrawal from the spindle.

6,562 of 1904.—W. B. PITT and R. PITT: *Doors, Gates, and like Structures.*

A swinging door, pivotally suspended at a point between its vertical edges to a suspension device depending from the door frame or other elevated structure, a wheeled carriage supporting the suspension device, an elevated track for said carriage extending transverse the doorway, and spring mechanism acting upon said carriage and tending to draw it back to the position which it normally occupies when the door is closed, in combination with a horizontally reciprocating device, suitably mounted, and engaging with a carrier pivoted to the inner edge of the door, and spring mechanism acting upon said reciprocating device, and tending to restore it to a position which normally holds the door closed.

7,068 of 1904.—G. MAHEUX: *Non-inflammable Composition for Use as a Protective Coating.*

A non-inflammable composition, distinguished by the incorporation with a selected vegetable, mineral, or animal tar of substances or products capable of rendering materials non-inflammable, these substances including especially boric acid, borax, and alum, with or without an addition of asbestos.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

790 of 1904.—H. FASEL: *Window Fastener*.
A window fastener, comprising in combination an arm of band iron or other suitable material, provided with a longitudinal slot at its free end, hinged fixed with the other end to the sash of the window, a clamp-screw fixed in the lower bar of the window frame passing through said longitudinal slot of the arm of the fastener, and a clamp-nut on said screw.

1,102 of 1904.—SUTCLIFFE, SPEAKMAN, and CO., LTD., and T. DAWBER: *Brick-making Machinery*.

In a self-rolling push board for the cutting-apparatus of a brick machine, the combination of a member having vertical hollow pockets therein, containing a textile fabric soaked in oil, a layer of textile fabric such as jutean closing the front of the pockets, and an outer covering of perforated sheet metal.

713 of 1904.—M. ULLMANN: *Self-closing Hinges*.

According to this invention the hinge consists of a lower part fixed to the wall, and an upper part attached to the door or window, and movable on the lower part, the upper part turning on a bolt fixed to the lower part, the upper part having a collar movable on it, and the lower edge of the collar and the upper edge of the lower part of the hinge are screw-shaped or inclined, the collar having a projection falling into a corresponding recess of the lower part of the hinge. The recess is larger than the projection, so that when the door is closed and the projection lies in the recess, there will be a small space on each side of the projection. The collar has an arm, through which passes a screw or bolt, which serves for adjusting the collar on the lower part of the hinge, and is also provided with a recess through which extends the lug of the upper part of the hinge and constitutes a stop for the bolt.

27,100 of 1903.—H. C. BAKER: *Construction of Manholes for Conduits*.

A manhole for electrical and other conduits, the enclosing or body wall of which is composed of separate layers of bricks or blocks of two different styles, said bricks or blocks being curved in such a manner that they form a manhole substantially elliptical in horizontal section, said manhole being also provided with a cover, comprising parallel bars and bricks or blocks of two different shapes, and in which is a central opening, provided with a removable cover.

7,001 of 1904.—E. MITCHELL and F. GUNN: *Tie for the Walls of Buildings, and the like*.
A tie for walls, consisting of two longitudinal strips of suitable material turned over at their ends to form angular or transverse arms, projections formed at the extreme ends of said arms, a web or webs at the centre of the longitudinal strips, said strips being engaged with each other at the angles.

7,904 of 1904.—A. SILLER: *Iron and Stone-work Flooring, and the like*.

An iron and stone flooring, the distinguishing feature being that trussed or framework cross girders or supports are laid on the under-supports or main girders, such, for example, as I-girders or masonry between two parallel rows of stonework, or in the material binding the same, these trussed girders being surrounded by filling, and, after the latter has been hardened, capable of taking up the whole of the strain.

9,139 of 1904.—G. F. FISHER: *Building Constructions, and Blocks therefor*.

A structure, comprising a suitable foundation, and building or facing blocks having each a securing iron embedded therein, said securing irons having their ends projecting from the upper and lower edges of said block, the projecting end or ends of each securing iron having its rear face flush with the rear face of the block in which it is embedded, and each block having the upper, lower, or both marginal portions thereof provided with a cut-away portion to receive the projecting lower ends of the securing iron in the block directly above, said cut-away portions being wider than the securing irons to permit of adjusting the blocks laterally with respect to the blocks beneath.

9,269 of 1904.—B. H. BORDER: *Manholes, Inspection Chambers, and Interceptors for Drains*.

In an inspection chamber, the combination of a solid floor, high benchings, and separate manhole sections, the floor and sections having wide flanges and grooves whereby a watertight joint may be made between the same. The combination with an interceptor having a pivoted valve for the clearing eye and a catch to receive the loose side of said valve, of a flange to make a watertight joint with the manhole section above it, the front portion of

said interceptor being formed to fit a recess in the floor of an inspection chamber.

9,640 of 1904.—J. P. DOUGLAS: *Siphon Flushing Cisterns*.

A method of starting the action of a siphon flushing cistern, having an inverted bell serving to cover a trap inlet to the siphon, and to imprison air as the cistern is charged with water so as to prevent water from overflowing through an opening the bell interior to the atmosphere when the cistern is charged with water, so as to enable the imprisoned air to discharge and allow the water to rise in the bell until it overflows said inlet.

9,444 of 1904.—C. JACOBS: *Compound for Coating Bricks, Plastering, and the like*.

This invention relates to compounds for coating bricks, plastering, and the like, and has for its object to produce an inexpensive compound of this character which will render the objects upon which it is applied water and moisture proof, and whereby, in particular, the saltpetre contained in bricks and plaster commonly used, which sooner or later, to a greater or lesser extent, permeates to the surface thereof, through the action of the atmosphere, will no longer appear after this compound is applied thereto. The compound is formed by mixing caustic soda with nitric acid, muriatic acid, tartaric acid, and sugar of lead, mixed either with varnish or with oil.

9,765 of 1904.—A. DENAYER: *Cements and Limes*.

This invention relates to a process for increasing the resistance of Portland cement, and of other cements in general. The invention consists in mixing an alkaline silicate with a cement or lime before, or during, or after the burning operation.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 14.—By WALTON & LEE (at Newcastle, Kylee, Northumberland. — "Whistlebare Farm," 58 a. 2 r. 6 p., f.	8800
Blacksmith's shop, two houses, and nine cottages, and 9 a. 2 r. 35 p., f.	1,010
The "Foundry Inn," f., y. 5L	975
The "Oak Bull" p.h. and 6 a. 0 r. 4 p., y. 30L	1,200
Freehold house and shop, y. 20L	500
[June 15.—By KEMSLEY'S (at Romford, Romford, Essex.—152 and 154, London-rd., f., y. 46L	290
June 16.—By STEPHENSON & SON (at York), Copmanthorpe, etc., Yorks.—"Coppinhorpe Grange Farm," 225 a. 2 r. 0 p., f.	8,000
By RICHARDSON & PEARCE-BROWN (at York), Sutton-on-the-Forest, Yorks. — "Eastmoor Farm," 184 a. 0 r. 4 p., f.	2,000
"Westfield House Farm," 207 a. 0 r. 4 p., f.	4,400
"Bohemia Farms" (two), 470 a. 0 r. 30 p., f.	5,000
Huby, Yorks.—A freehold field, 15 a. 3 r. 36 p., f.	650
"Diana Field," 4 a. 2 r. 3 p., f.	123
Common Allotment, 2 a. 3 r. 8 p., f.	145
Farm House and 51 a. 1 r. 21 p., f.	610
By WALTON & LEE (at Darlington), Bowes, Yorks.—"The Climbony Estate," area 2,223 a. 2 r. 29 p., f. (in lots)	50,081
June 17.—By T. W. CAZE & SON (at Diss), Palgrave, etc., Suffolk.—"St. John's Estate," 94 a. 3 r. 18 p., f. and c.	4,800
"The Millway Farm," 98 a. 2 r. 22 p., f. and c.	1,250
"The Spring Farm," 153 a. 1 r. 34 p., f. and c.	1,900
A cophold farm, 130 a.	130
Four enclosures, 24 a. 2 r. 28 p., f. and c.	320
A cophold double cottage and 11 a. 2 r. 10 p. Wortham, etc., Suffolk.—"The Rookery Estate," 294 a. 1 r. 30 p., f. and c.	6,000
"The Lig Farm," 273 a. 3 r. 22 p., f. and c.	4,250
A freehold double cottage	123
Royston, Norfolk.—Four enclosures of pasture, 18 a. 2 r. 30 p., f.	200
By H. J. AUSTEN & SONS (at Tunbridge Wells), Lambhurst, etc., Kent.—"Lidridge Place Farm," 37 a. 1 r. 34 p., f., p.	1,525
"The Lower Field," 7 acres, f., p.	120
June 18.—By FRANKLYN, GALE, & NEWTON Ipsden, Oxon.—"Poots Farm," 142 a. 0 r. 32 p., f., p.	1,400
By BRITON, KNOWLES, & CO. (at Gloucester), Redley, Gloucester.—"Coveley's Elm Farm," 94 a. 2 r. 9 p., f., p.	3,675
"Phillips' Orchard," 2 a. 3 r. 27 p., f.	200
"Lower Wilmore" meadow, 12 a. 2 r. 29 p., f.	475
"Espany Piece" enclosure, 11 a. 0 r. 3 p., f.	350
"Ralph's Ford Cottage," and 0 a. 2 r. 5 p., f.	120
June 20.—By GEDDY & GEDDY, Cobham, etc., Surrey.—"Pains Hill Estate," 260 a. 1 r. 0 p., f., p.	35,000
By S. BRADFORD, Fimblec.—Warwick-st., etc., f.g.r. 34L, reversion in 20 yrs.	2,650
Tadbrook-st., etc., f.g.r. rents 87L, reversion in 20 yrs.	4,275
Vauxhall Bridge-rd., f.g.r. 7L, reversion in 20 yrs.	480
By A. SAVILL & SONS, Hockley, Essex.—"Hockley Spa" (including pump room and medicinal spring), f., p.	250
By E. SIMPSON, Dulwich.—86, Rosendale-rd., n.t. 44 yrs., g.r. 10L, e.r. 40L	220

By C. B. HILLIARD & SON, Toleshunt Major, etc., Essex.—"Joyce's Farm," 196 a. 2 r. 25 p., f., p.	£2,100
Asheildham, Essex.—"Sandlings Farm," 59 a. 1 r. 2 p., f., p.	380
By JONES, SON, & DAY, Kingsland-road.—Nos. 66 and 68 (s.), y. 61L 4s. Bethnal Green.—Virginia-rd. (the "Fountain" p.h.), f.g.r. 100L, n.t. 36 yrs., g.r. 70L, with reversion	800
Green-st., g.r. 70L, n.t. 29 yrs., e.r. 50L	415
Walworth.—Towenly-st., f.g.r. 9L, n.t. 56 1/2 yrs., g.r. nil	320
Rotherhithe.—2, Corbett's-lane, and plot of land, f., w.r. 31L 4s.	135
Canning Town.—116, Cundy-rd. (s.), f., e.r. 35L	250
Plaistow.—Hilda-rd., plot of freehold building land	210
Edmonton.—5, Baden-rd. (s.), f., e.r. 35L	315
Poplar.—47, 49, and 51, Emmett-st. (s.), f., e.r. and y.r. 78L 12s.	650
Greenwich.—Woodwharf, a freehold wharf, w.r. 16L 12s.	610
Walthamstow.—The Avenue, a plot of freehold building land	455
74, Black Horse-lane (s.), f., y.r. 20L	320
68, Bedford-rd. (s.), f., e.r. 30L	280
Stock Newington.—100 and 102, Milway-gr., f., e.r. 93L	1,250
Finsbury.—Clifton-st., f.g.r. 800L, reversion in 74 1/2 yrs.	8,400
Hackney.—258, Wick-rd. (shop, slaughter-house, etc.), f., y.r. 32L	200
Plaistow.—217 to 239 (odd), Grange-rd., f., y.r. 307L 8s.	480
By ALFRED RICHARDS (at Tottenham), Tottenham.—255, Park-lane, n.t. 40 yrs., g.r. 5L 10s., y.r. 24L	205
1 and 2, Rose-cottages, f., w.r. 32L 10s.	205
464, 466, and 468, High-rd. (s.), f., y.r. 200L	3,570
420, High-rd. (s.), f., y.r. 45L	735
422, High-rd. (s.), n.t. 62 yrs., g.r. 15L, y.r. 80L	1,070
424, High-rd. (s.), part f. and part n.t. 62 yrs., g.r. 1L, y.r. 60L	1,050
High-rd., f.g.r. 15L, reversion in 62 yrs.	470
1 1/2 and 3, Stoneley-rd. (s.), with stabling n.t. 62 yrs., g.r. 45L, y.r. 103L 16s.	380
58 and 60, Somerset-rd., f., w.r. 52L	535
75 to 83 (odd), Somerset-rd., f., w.r. 93L 10s., 93, 95, 97 to 107 (odd), High-rd. (s.), f., w.r. 145L 12s.	1,700
1, 2, and 3, Wilsheer-cottages, "Holly Cottage," 1 to 5, Chapel-pl., and piece of garden ground, f., y.r. 130L 4s.	810
June 21.—By BALCH & BALCH, Marylebone.—26, 27, and 28, Linne-st., 5 and 9, Boston-mews (smithy and stabling), n.t. 16 1/2 yrs., g.r. 25L 12s. 11d., y.r. 196L 10s.	750
Holloway.—57, St. John's-village, f., p.	770
Cricklewood.—1, 3, 5, and 7, Oak-gr., n.t. 76 1/2 yrs., g.r. 25L 4s., y.r. 185L	1,325
By CHENNOCK, GALSORTHY, & CO., Taplow, Bucks.—Hunt-lane, "Wittage Field," 4 a. 1 r. 26 p., e., y.r. 6L 15s.	340
By DEBENHAM, TEWSON, & CO., Mayfield, Sussex.—"Park Farm," 169 a. 2 r. 38 p., f., y.r. 104L	4,500
By H. V. HOLMES & CO., Flasbury.—71 and 73, Tabernacle-st. (s.), n.t. 43 1/2 yrs., g.r. 55L, y.r. 150L	925
By MARK LITTLE & SON, Rotherhithe.—61, Paradise-st. (s.), w.r. 36L 5s. Bow.—38, Addington-rd., n.t. 41 yrs., g.r. 6L 10s., y.r. 40L	345
Poplar.—132 and 134, Upper North-st., n.t. 43 1/2 yrs., g.r. 5L 10s., w.r. 55L 18s.	420
Leytonstone.—"Holly-rd.," "Sherwood," f., e.r. 50L	585
By A. M. NEWCOMBE, Beckenham.—25, Mackenzie-rd., and two plots of land, f., y.r. 29L	510
257, Mackenzie-rd., f., e.r. 32L	550
By JOSEPH STOWER, Bromley, Kent.—Highest, "Redwood House," area 20,150 ft., f., p.	9,020
Imber, Wilts.—"Brow's Farm," 574 a. 1 r. 28 p., f., y.r. 300L	4,300
By STANFORD & BROOM (at Halesworth), Hevingham, etc., Suffolk.—"The Moat Farm," 84 a. 2 r. 15 p., f.	600
Halesworth, Suffolk.—"The Hill Farm," 55 a. 0 r. 19 p., f.	1,360
The gravel pit and gravel pit field, 3 a. 1 r. 3 p., f.	165
"Upper Lock Field," 5 a. 0 r. 14 p., f.	170
Five enclosures, 10 a. 1 r. 37 p., f.	250
By C. HASLET (at Mason's Hall Tavern), Marylebone.—Georg-st., "The St. Andrew's Tavern," n.t. 18 1/2 yrs., y.r. 120L, with goodwill	3,500
By GEORGE LOVELL & SON (at Coventry), Coventry, Warwick.—Spout-st. 2 and 3, Court 9 (tenements, slaughter-house, etc.), area 473 yds., f.	1,000
4 to 10, Court 9, area 383 yds., f.	550
Keresley, Warwick.—Two enclosures, 11 a. 2 r. 15 p., f.	800
June 22.—By BAXTER, PAYNE, & LEPPER, Blackheath.—Lee-terrace, f.g.r. rents 60L, reversion in 22 yrs.	3,025
Sutton-at-Hone, Kent.—2, "The Green House," and 0 a. 0 r. 4 p., f., p.	1,385
Two freehold arable fields, 23 a. 3 r. 5 p.	1,300
"Wiffin's Farm," 10 a. 0 r. 37 p., f., p.	800
Market garden land, with granary, etc., 14 a. 1 r. 35 p., f.	680
By W. CROMACK, Edmonton.—12 to 18 (even), Gilpin-cres., n.t. 93 yrs., g.r. 22L, w.r. 93L 12s.	430
Gilpin-cres., a plot of freehold building land, area 5,070 ft.	150
1, 2, and 3, Linton-broadway (s.), n.t. 93 yrs., g.r. 24L, w.r. 71L 18s.	350
By C. RAWLEY CROSS & CO., Sutton, Surrey.—Mulgrave-rd., "Kinloch House," f., e.r. 150L	2,950

SLATES—(continued)—

in.	ft.	in.	£ s. d.
12	6	6	per 1000 of 1200 atr. d.
10	13	5	"
8	10	5	"
10	12	6	"
10	12	6	"
8	12	6	"

TILES.

est.	per 1000	atry. depôt.
Hip and Valley tiles	3	7 per doz.
est. Brassy tiles	50	0 per 1000
o. Ornamental tiles	52	0 per doz.
Valley tiles	4	0 per doz.
est. Rulon red, brown, or	57	6 per 1000
brindled do. (Edwards)	60	0 per doz.
o. Ornamental do	60	0 per doz.
Hip tiles	3	0 per doz.
Valley tiles	3	0 per doz.
est. Red or Mottled Stafford	51	9 per 1000
shire do. (Peakes)	54	6 per doz.
o. Ornamental do	54	6 per doz.
Hip tiles	3	8 per doz.
Valley tiles	3	8 per doz.
est. "Rosemary" brand	48	0 per 1000
plain tiles	50	0 per doz.
est. Ornamental tiles	50	0 per doz.
Hip tiles	4	0 per doz.
Valley tiles	3	8 per doz.
est. "Hartshill" brand	50	0 per 1000
plain tiles, sand faced	47	6 per doz.
o. Ornamental do	50	0 per doz.
Hip tiles	4	0 per doz.
Valley tiles	3	6 per doz.

WOOD.

At per standard.	£ s. d.	£ s. d.
Deals: best 3in. by 11in. and 4in.	15	10 0
by 9in. and 11in.	14	0 0
Deals: best 3 by 4	14	0 0
Battens: best 2 1/2 in. by 7 in. and	11	10 0
8 in. and 1 1/2 in. by 8 in.	10	0 0
Battens: best 2 1/2 by 6 and 3 by 6	10	0 0
less than 7in. and 8 in.	10	0 0
Deals: seconds	1	0 0
Battens: seconds	0	10 0
2 in. by 5 in. and 1 1/2 in. by 8 in.	9	0 0
2 in. by 4 1/2 in. and 2 in. by 5 in.	8	10 0
Foreign Sawn Boards—	0	10 0
1 in. and 1 1/2 in. by 7 in.	1	0 0
3 in.	1	0 0
At per load of 50 ft.		
Fir timber: best middling Danzig	4	10 0
or Monarch (average specification)	4	5 0
Seconds	4	5 0
Small timber (8 in. to 10 in.)	3	12 6
Small timber (6 in. to 8 in.)	3	0 0
Swedish Baltic	2	15 0
Pitch-pine (30 ft. average)	3	5 0

JOISTS, GIRDERS, &c.

Prepared Flooring (continued)—	£ s. d.	£ s. d.
1 in. by 7 in. yellow, matched	0	14 0
and headed or V-jointed brds.	0	14 0
3 in. by 7 in. white do.	0	10 0
1 in. by 7 in. do. do.	0	11 6
6 in at 6d. to 9d. per square less than 7 in.	0	13 6

WOOD—(continued)—

Per square.	£ s. d.	£ s. d.
Rolled Steel Joists, ordinary	6	5 0
sections	6	5 0
Compound Girders, ordinary	8	2 6
sections	8	2 6
Angles, Tees and Channels, ordinary	7	17 6
sections	7	17 6
Flitch Plates	8	5 0
Cast Iron Columns and Stanchions	7	2 6
including ordinary patterns	7	2 6

WOOD—(continued)—

Per ton, in London.	£ s. d.	£ s. d.
Iron—	£ s. d.	£ s. d.
Common Bars	7	5 0
Staffordshire Crown Bars, good	7	15 0
merchant quality	7	15 0
Staffordshire "Marked Bars"	10	0 0
Mild Steel Bars	8	15 0
Hoop Iron, best price	9	5 0
Galvanized	17	10 0
"And upwards, according to size and gauge."		
Sheet Iron (Black)	9	15 0
Ordinary sizes to 20 g.	10	15 0
" 24 g.	12	5 0
" 26 g.	12	5 0
Sheet Iron, Galvanized, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft.	12	15 0
3 ft. to 20 g.	13	5 0
Ordinary sizes—23 g. and 24 g.	13	5 0
" 26 g.	14	5 0
Sheet Iron, Galvanized, flat, best quality—		
Ordinary sizes to 20 g.	16	0 0
" 22 g. and 24 g.	16	0 0
" 26 g.	18	0 0
Galvanized Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. by 20 g.	12	10 0
" 22 g. and 24 g.	13	0 0
" 26 g.	13	5 0
Best Soft Steel Sheets, 6 ft. by 2 ft.	11	15 0
3 ft. to 20 g. and thicker	12	15 0
Best Soft Steel Sheets, 22 g. & 24 g.	14	0 0
" 26 g.	14	0 0
Cut nails, 3 in. to 6 in.	9	0 0
(Under 3 in., usual trade extras.)		

WOOD—(continued)—

Per ton, in London.	£ s. d.	£ s. d.
LEAD, &c.	£ s. d. <td>£ s. d. </td>	£ s. d.
Lead—Sheet, English, 3lb. and up	14	15 0
Type in coils	17	5 0
Sold pipe	17	5 0
Compo pipe	17	5 0
Zinc—Sheet—		
Vicille Montagne	27	0 0
Silesian	26	15 0
COPPER—		
Strong Sheet	6	0 10 0
Thin	0	11 0
Copper nails	0	11 0
BRASS—		
Strong Sheet	0	10 0
Thin	0	11 0
Tin—English Ingots	0	1 3 0
SOLDER—Plumbers'	0	0 6 0
Timmen's	0	0 8 0
Blowpipe	0	0 8 0

WOOD—(continued)—

Per square.	£ s. d.	£ s. d.
Prepared Flooring (continued)—	£ s. d. <td>£ s. d. </td>	£ s. d.
1 in. by 7 in. yellow, planed and	0	13 6
shot	0	13 6
1 in. by 7 in. yellow, planed and	0	14 0
matched	0	14 0
1 1/2 in. by 7 in. yellow, planed and	0	16 0
matched	0	16 0
1 in. by 7 in. white, planed and	0	12 6
shot	0	12 6
1 in. by 7 in. white, planed and	0	15 0
matched	0	15 0
1 1/2 in. by 7 in. white, planed and	0	15 0
matched	0	15 0
3 in. by 7 in. do. do. matched	0	11 0
and headed or V-jointed brds.	0	13 6

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursday. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100l. unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

ABBOTS LANGLEY.—For sewerage and sewage disposal works (Abbots Langley, Hunton Bridge, and Trowley Bottom sewerage), for the Watford Rural District Council. Mr. E. Lally, engineer, 9, Market-street, Watford.

Mowlem & Co., Ltd.	£21,295 0 0	Mann	£17,274 15 6
J. Jackson	20,052 5 0	D. Peardis	16,436 0 0
Braithwaite	18,132 0 0	J. Dickson	16,327 0 0
Trim	18,084 0 0	Wilkinson	
B. Cook & Co.	17,330 0 0	Bros.	15,785 0 0
Rayner	16,472 0 0	H. Brown	
		Watford*	15,000 0 0

BREDBURY.—For building a caretaker's dwelling, etc., at Bredbury Sewage Works, for Bredbury and Romley Urban District Council.

B. Armitage, Hyde*	£309 6
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CAERPHILLY.—For section No. 1 of enlargement of Parish Church, for the Rev. C. L. Price. Mr. G. E. Hilday, architect, Cardiff. Quantities by Mr. J. W. Rodger, quantity surveyor, 14, High-street, Cardiff.

T. F. Howells	£3,299 0 0	S. Shepton & D. Davies	3,245 0 0
Blacker Bros.	3,025 0 0	Chive road, Cardiff	2,423 0 0
A. W. Co.	2,975 0 0	Knox & L. Lattey	2,297 0 0
Co.	2,940 10 6		
		Withdrawn.	

CHEPSTOW.—For building south aisle, transept, and organ chamber, St. Mary's Church. Mr. J. Coates Carter, architect, Bank-buildings, Cardiff.

J. Allan	£4,220 10 0	Lead better	£23,136 0 0
Gilow & Co.	4,064 15 6	W. A. Linton	3,106 0 0
S. Shipton & Son	4,027 0 0	T. J. Williams	2,987 1 9 1/2
J. Perkins & Son	4,015 0 0	C. H. Reed	2,947 0 0
A. King & Son	3,398 0 0		

CHUDLEIGH.—For constructing a masonry reservoir to contain 70,000 gallons, for the Newton Abbot Rural District Council. Mr. S. Segar, engineer, Unicorn-street, Newton Abbot.

T. Vanstone	£1,095 0 0	E. Pike, Tor-	
J. Shaddock	995 0 0	quay*	£828 0 0
Hawking & Best	940 10 0		

DEVONPORT.—For levelling, paving, etc., Barton-avenue, for the Borough Council. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, 29, Ker-street, Devonport.

J. Budge	£733 6 1	E. Duke	£428 16 4
J. F. Donne	464 2 6	T. Doney	425 15 4
Pearce Bros.	456 10 0	F. J. Stanbury,	
Jefford & Sons	453 8 1	Devonport*	400 13 3

DEVONPORT.—For levelling, paving, etc., lane between Barton-avenue and Townshend-avenue, for the Borough Council. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, 29, Ker-street, Devonport.

F. J. Stanbury	£518 17 8	J. Budge	£469 17 6
Pearce Bros.	495 3 1	E. Duke	457 0 0
Jefford & Sons	482 10 6	J. F. Donne	446 13 4
T. Doney	472 19 8	St. Bouveraux	457 10 0

DEVONPORT.—For levelling, paving, and completing Townshend-avenue, for the Borough Council. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, Devonport.

J. Budge	£723 0 10	Pearce Bros.	5474 7 8
T. Doney	492 14 5	E. Duke	457 13 11
J. F. Donne	490 15 9	F. J. Stanbury,	
Jefford & Sons	487 13 0	Devonport*	428 1 0

DUBLIN.—For erecting a caretaker's cottage, etc., Bluebell Graveyard, for the South Dublin Rural District Council. Mr. T. J. Byrne, Surveyor, 1, James's-street, Dublin. Quantities by the architect and surveyor.

Design No. 1.	Design No. 2.	
G. P. Walsh	£345 0 0	£380 0 0
G. Dixon	347 0 0	377 6 5
J. Clarke, 13, Upper Clanbrassil-street, Dublin	324 0 0	349 10 0
J. P. Macken	354 3 0	373 5 0
T. Somers & Son	310 0 0	340 0 0

ELLON (Scotland).—Accepted for erecting a cottage at Ellon, for Mr. Forbes Philip. Mr. Wm. Davidson, architect, Ellon.

Mason Work: A. Scroggie, Kintarrachie, Ellon	£380 0 0
Carpenter Work: Wm. Auld, Station-road, Ellon	220 0 0
Slater Work: F. McKee, Bridge-street, Ellon	61 12 0
Plaster Work: J. & R. Seivewright, Inverurie	69 11 0
Plumber Work: A. Gibb, Bridge-street, Ellon	90 0 0
	£811 3 6

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Rebuilding Retort House at Gas Works, Tirphill.	New Trade-car Gas Co.	G. Keneshole, Architect, Barged	July 2
Footway in Lower-road	New Shoreham U.D.C.	W. Nye, Town Surveyor, Town Hall, Shoreham	July 4
Shops, Church Bank, Bradford	Manchester Education Committee	J. H. Dixon, Architect, 90, Heap-lane, Bradford	do.
Timber for Handicraft Centre	Manchester Education Committee	Education Offices, Deansgate, Manchester	do.
Wrought-iron Window Grilles, etc., Lancaster Asylum	Visiting Com., County Lunatic Asy.	Clerk of Works at Asylum, Lancaster	do.
Two Semi-detached Villas at Menston	Woking U.D.C.	J. W. C. Atkinson, Architect, 1, Ivesgate, Bradford	do.
Repairs to Engine-house at Sewage Farm	Halifax Corporation	G. J. Wooldridge, Surveyor, Bank Chambers, Woking	do.
Private Improvement Works, Eldroth-road	Halifax Education Committee	J. Lord, Borough Engineer, Town Hall, Halifax	do.
Painting, etc., Council Schools	Widnes Corporation	J. S. Sinclair, Borough Surveyor, Town Hall, Widnes	do.
Graves at Borough Cemetery	do.	do.	do.
Painting Fire Station and Cottage	do.	do.	do.
Painting Education Department's Offices	do.	do.	do.
Sinking Well at Cranford	Kettering R.D.C.	H. Norwood, 11, Bowling Green-avenue, Kettering	do.
Painting, etc., Market and Corn Exchange	Shrewsbury Markets Committee	W. Chapple Edgewood, Borough Surveyor, Shrewsbury	do.
Alterations at Eden Kille Parish Church	do.	J. Wittet, Architect, Elgin	do.
Convenience at Kelvin-grove Park	Glasgow Corporation	Office of Public Works, City Chambers, 64, Cochran-st., Glasgow	do.
Disinfectants	Kingstown U.D.C.	P. Dunlop, Town Hall, Kingstown, Ireland	do.
Boardroom at Offin, Louth Workhouse	Guardians	F. Beattie, Architect, 29, Corn Market, Louth	do.
Re-building the Light Dragon Inn, Bourne	Messrs. Hunt	E. G. Shilcock, Architect, Bourne, Lincs.	do.
Heating Apparatus, Town Hall Buildings	Mansfield Corporation	R. F. Vallance, Borough Surveyor, White Hart-chambs, Mansfield	do.
Steel Vertical Boiler for Gas Department	Selby U.D.C.	T. H. Alderson, Engineer and Manager, Gasworks, Selby	do.
Sewage Works, Painter's-lane, Enfield	Cheshunt U.D.C.	A. C. Lee, Clerk, Manor House, Cheshunt	do.
Corrugated Iron Cottage, Throckley	Newburn U.D.C.	T. Gregory, Surveyor, Council Office, Newburn, Northumberland	July 5
Alterations, etc., Elmstead Church Schools	Hamilton Town Council	J. W. Start, Architect, Colchester	do.
Workmen's Dwellings at Low Waters	Salford Corporation	H. Brier, Architect, 144, St. Elizabeth-st., Glasgow	do.
Street Paving	Sec. of State for India in Council	Borough Engineer's Office, Town Hall, Salford	do.
Switches and Crossings	Tynemouth Corporation	Director-General of Stores, India Office, Whitehall, S.W.	do.
Road Works, Nils-street, etc., North Shields	do.	J. F. Smillie, Borough Surveyor, Tynemouth	do.
Council Chamber, etc., Court-house, York	East Ham Education Committee	W. H. Hill & Son, Architects, 28, South Mall, Cork	do.
Repairs to Tar Paving, Plasnet-lane, etc.	do.	R. L. Curtis, Architect, 11 and 12, Finsbury-square, E.C.	do.
Repairing, Painting, etc., at Schools	do.	do.	do.
Cleaning and Whitewashing Latrines, etc., at Schools	do.	Education Office, East Ham	do.
Six Cottages, Edgeland, Thornhill, York	Littlehampton U.D.C.	H. Howard, F.S.I., Town Offices, Littlehampton	July 6
450 yds. of Water Mains	Cranbrook R.D.C.	T. H. Crampton, Clerk, Cranbrook	do.
Steam Rolling and Scarfing	Fife-shire Property Co.	W. Williamson, 220, High-street, Kirkcaldy	do.
Shops and Dwelling-houses, High-street, Kirkcaldy	Birmingham Corporation	J. Price, City Engineer, Council House, Birmingham	do.
Widening Bridge, Aston-road (Contract 2)	do.	do.	do.
Widening Bridge, Aston-road (Contract 1)	do.	do.	do.
Gravel and Slag	Reedness & Swinford D. Ge. Comrs.	G. England, Bank Chambers, Goole	do.
Telephone and Fire Alarm Services at Asy., Bridgend	Glanorgan County Asylum	W. E. R. Allen, Glanorgan County Council Offices, Cardiff	do.
Eighteen Artisans' Dwellings, Cumberland-st., etc.	Kingstown U.D.C.	Surveyor, U.D.C. Offices, Town Hall, Kingstown, Ireland	do.
Thirty-six Artisans' Dwellings, Cumberland-st., etc.	do.	do.	do.
3,500 yds. of Hardblue Floor Tiles	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
Isolation Hospital, Lancaster	Committee of County Lunatic Asy.	Willink & Thicknesse, Architects, 74, Castle-street, Liverpool	do.
Crematorium, Schoolmoor Cemetery	Bradford Corporation	F. E. P. Edwards, City Arch., Whitaker-blds., Brewery-st., Bradford	do.
Disinfecting Station, Canal-road	Glasgow Corporation	Office of Public Works, City Chambers, 64, Cochran-st., Glasgow	do.
Four Cast-iron Hot Water Storage Tanks at Baths	St. Giles, Camberwell, Guardians	W. A. Bunny, Engineer, 53, Victoria-street, Westminster, S.W.	do.
Boring Artesian Well, Constance-road Workhouse, S.E.	Edinburgh Corporation	W. H. Greys, A.R.S.E.A., 29, Bond-street, Leeds	do.
Alterations, etc., Residence in The Driys, Rounday	do.	Mr. Proudfoot, City Road Surveyor, City Chambers, Edinburgh	July 7
Bridge Over Union Canal at Ashley-terraces	do.	do.	do.
Alteration of Pillars, Wall, etc., Arboretum-avenue	Blaydon, U.D.C.	R. Biggins, Sanitary Inspector, Council Offices, Blaydon	do.
Seavenging	do.	G. Syon, Surveyor, Council Offices, Blaydon	do.
Road Material	Rhonda Education Committee	J. Rees, Hillside Cottage, Pentre	do.
Painting, etc., Council Schools	Maerdy Building Society	W. Lavis, Mechanical Engineer, Maerdy Collieries	do.
Thirty Cottages	Manchester Education Committee	Education Offices, Deansgate, Manchester	do.
Roads	do.	T. J. Barlow, Athol House, Fraser-street, Ashton-under-Lyne	do.
Colourwashing and Painting Elementary Schools	do.	J. Morris, County Surveyor, Broadway Buildings, Reading	do.
Elec. Lighting, St. Michael's Pa. Ch., Ashton-u-Lyne	Weymouth & Melcombe Regis U.D.C.	Architect, Lydney	do.
Police-station at Thatcham, Berks.	Weymouth U.D.C.	W. Barlow Morgan, A.M.Inst.C.E., Market-street, Melcombe Regis	do.
Additions, etc., to House, Lochend, Scotland	Edinburgh Roads Department	do.	do.
Sewer, Myrtle-terrace, Weymouth	Bermansday Guardians	Mr. Proudfoot, City Road Surveyor, City-chambers, Edinburgh	do.
Messroom, etc., at Destructor Works, Westham	Liskeard R.D.C.	Newman & Newman, 31, Tooley-street, S.E.	do.
Paving Carriageways, High-street	Glasgow Corporation	E. Mallett, Sanitary Inspector, Pendrife, Duloe, R.S.O.	July 8
Paving, etc., at Elm-row and Newbridge-place	do.	Office of Public Works, City Chambers, 64, Cochran-st., Glasgow	do.
Parapet, Railing, etc., in Widening Dalry-road	do.	Morgan & Elford, 1, Jeffrey-street, Mountain Ash	do.
Painting, etc., Lower-road in Widening, Rotherhe, S.E.	Leeds Corporation	City Engineer's Office, Leeds	do.
350 ft. of Sewers at Polman	do.	do.	do.
Pipe, Drains, and Siphon Tank at Robroydon	do.	do.	do.
Recreation Ground at Mountain Ash	do.	do.	do.
Ladies' & Gentlemen's Conveniences, Chapel Allerton	do.	do.	do.
Boundary Wall, Chapel Allerton Recreation Ground	do.	do.	do.
Wrought-iron Railings	do.	do.	do.
W. K. M. Mess-rm. etc., Wat'woks Depot, Manor-rd.	do.	do.	do.
Ten Cottages at West Allotment, Backworth	Aged Mine Workers' Homes Assoc.	T. Tulip, Wainwey Hill, Choppington	do.
Painting & Decorating, Free Library & Public Hall	Altrincham Free Library Committee	F. Beckett, Secretary, Free Library, Altrincham	do.
Reservoir and Pipes, Hapton Water Supply	Lord Abingdon	J. Diggle & Son, Engineers, Hind Hill-street, Heywood	do.
House, Cark-in-Cartmel	Dewsbury Corporation	Somes & Henshaw, Architects, Oxford Cham., Abbey-rd., Barrow	do.
Alterations to Brook Cottage, Cark-in-Cartmel	do.	do.	do.
Materials	do.	do.	do.
Arcade, Southford-street	Coventry Market Hall Committee	H. Dearden, Borough Engineer, Town Hall, Dewsbury	July 9
100,000 Pairs of Arc Lamp Carbons	Dublin Electricity Works	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry	do.
Making-up King Edward-road, Shenfield	Billerica U.D.C.	F. J. Allan, Secretary of the Electricity Comtee., 3, Cork-hill, Dublin	do.
Surface-water Drain in Rose Valley	do.	E. S. Lewis, Clerk to Council, Brentwood	do.
Steam Road Roller	Fleetwood U.D.C.	J. Tisdley, Town Hall, Fleetwood	do.
Thirty-five Houses at Derf, near Barged	Derf No. 1 Building Club	J. Llewellyn Smith & Davies, Architects, Aberdare	do.
Alterations and re-drainage, Bitterne Police Station	Southampton County Council	W. J. Taylor, County Surveyor, The Castle, Winchester	do.
Additions and re-drainage, Hythe Police Station	Leeds Corporation	City Engineer's Office, Municipal Buildings, Leeds	do.
Paving and Flagging Streets	do.	do.	do.
Macadamising & Flagging Osmondthorpe-in., Leeds	do.	do.	do.
Masonry Walls and Corrugated Iron Fencing	Tuam New Racecourse	R. J. Kirwan, M.Inst.C.E., 9, Gardenfield, Tuam	July 10
Corrugated Iron Building at Prenchestreet, Brighton	Trust of Cayton, Ecclefiant Charity	W. A. Cunneen, Surveyor, 75, Water-street, Glasgow	July 11
7,130 yds. of Sewers, etc., Penwitham	Preston R.D.C.	F. E. Dixon, C.E., 49, Lane-street, Preston	do.
Oil Engines, Air Compressors, etc.	do.	do.	do.
Repairs and Painting to Provided Schools	Southampton Education Committee	Borough Engineer, Southampton	do.
Protecting Bank of River, Onas at Cawood	Trust of Cayton, Ecclefiant Charity	Parker & Parker, Abbey Yard, Selby	do.
Pumping Engine and Pump	Carriek-on-Shannon Waterwks Com.	Secretary of Waterworks Committee, Carriek-on-Shannon	do.
Clean'g & Paint'g Westcote's Library, Narborough-rd.	Leicester Free Libraries Committee	E. G. Mawbey, M.Inst.C.E., Town Hall, Leicester	do.
Congregational Church, Birkdale, Southport	Wivenhoe U.D.C.	H. & W. Wade, Architect, 27, Birley-street, Blackpool	do.
Making-up, etc., Station-road, Wivenhoe	St. Marylebone Guardians	E. S. Beard, Surveyor, Headgate, Colechester	do.
Relay, Drains, etc., Packham-st. Infrn., Notting Hill	M.B. of Finsbury	A. Saxon Snell, F.R.L.S.A., 22, Southampton-higs, Chancery-lane	do.
Alterations to Town Hall, Rosebery-avenue, E.C.	Meriden Guardians	Borough Surveyor's Office, Town Hall, Rosebery-avenue, E.C.	do.
Reconstruction of Workhouse	Warrington Corporation	H. W. Chattaway, Architect, Trinity Churchyard, Coventry	July 12
Steel Poles, Trolley Wires, etc., at Cawood	The L.C.C.	M. Fitzmaurice, Engineer, County Hall, Spring Gardens, S.W.	do.
Reconstruction of Bridge, High-street, Kingsland	South Indian Railway Co.	H. W. Notman, 55, Greenwich-street, London, E.C.	do.
Rolling Stock	Belfast Corporation	A. Brunwell Thomas, Architect, 5, Queen Anne's-gate, Westminster	do.
Furniture, etc., for City Hall, Wivenhoe	Acton District Council	do.	do.
Electric Lighting Station, Iron Fencing & Hurdles, etc.	Willesden D.C.	Council's Engineer, Public Offices, Dyne-road, Kilburn, N.W.	do.
Road-making and Paving Works	Braintree U.D.C.	H. B. Nankivell, Surveyor, Vestry Hall, Braintree	July 13
Making-up Victoria-street	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Painting, etc., of Schools	Bristol Education Committee	W. A. Adams, Secretary, Guildhall, Bristol	July 14
Sewer Work at Mars-street and Darley-road	Hackney Borough Council	N. Scorgie, Borough Engineer, Town Hall, Hackney, N.E.	do.
Painting & Decorating Council Chbr., etc., Town Hall	do.	do.	do.
Operating-room, etc., at St. Dunstan's-rd. Infirmary	Fulham Guardians	A. Saxon Snell, F.R.I.B.A., 22, Southampton-bldgs., Chancery-lane	do.
Addition to Electric Works Building	Kingston-on-Thames Corporation	Borough Surveyor, Clatter House, Kingston-on-Thames	do.
Thirty Semi-Detached Houses at Graysley-Edw.	Trustees of Graig Building Club	G. L. Watkins, Architect, Station-terrace, Caerphilly	July 15
Restoration of Premises, Wharf-street, Cardiff	Messrs. T. Jones & Co.	R. & S. Williams, Architects, Wharfon-street, Cardiff	do.
Sewage Disposal Works	Stratford-on-Avon Corporation	Willcox & Raikes, Eng. Union-chamb., 58, Temple-row, Birmingham	do.
Boiler House, Bathroom, etc., at Workhouse	Thirsk Guardians	T. Stokes, Architect, Thirsk	do.
Making-up Roads	Wimbleton U.D.C.	C. H. Cooper, Eng. & Sur., Council Offices, Broadway, Wimbleton	do.
New Cast-iron Buildings at Weymouth, Norfolk	Admiralty	Admiralty Office, 21, Northumberland-avenue, W.C.	July 16
Market Buildings, Bridgford, Glamorgan	Right Hon. Earl of Duraevre	H. Martin & Son, Architects, 29, Paradise-street, Birmingham	do.
Shop and Showrooms, King Cross-street, Halifax	Whitechurch (Salop) Guardians	W. Webb, Architect, Bargates, Whitechurch	do.
Fireproof Verandahs, etc., to Union Buildings	City of Wakefield	Cox, Trinnell, & Dawson, 4, Adam-street, Adelphi, W.C.	do.
Free Library Buildings	Borough of Kingston-on-Thames	Borough Surveyor, Clatter House, Kingston-on-Thames	do.
Granite	Governors Cheltenham Gram. Schl.	C. F. Horsfall & Son, Architects, Lord Street-chambers, Halifax	do.
New Science and Art Buildings in High-street	Workington Corporation	W. H. Stanley, A.M.Inst.C.E., Market House-chamb., Trowbridge	July 18
Gas-Producing Plant, etc., at Sewage Works	Aston Manor Corporation	T. J. Ballard, Electric Eng., Electric Wks., Chester-st., Aston Manor	do.
Pipework, etc.	Settle R.D.C.	T. A. Foxcroft, Engineer, Town Hall, Settle	do.
Keasden Water Supply Works	Poplar Borough Council	H. Haselford, Borough Surveyor, Council Offices, High-street, Poplar	do.
Clearing Site for Library, Brunsvick-road, Bromley	Workington Corporation	W. L. Eaglesfield, Boro. & Waterworks Eng., Town Hall, Workington	do.
500 Tons of Cast-Iron Water Pipes	Wimbleton U.D.C.	C. H. Cooper, Eng. & Sur., Council Offices, Broadway, Wimbleton	do.
Two Road Cast-iron Pipes	C.B. of West Ham Edu. Department	W. Jacques, A.R.I.B.A., 2, Fen-court, Feuchurch-street, E.C.	do.
*Window Blinds, Shipman-rd. & Whitebone-lane Sells	do.	General Manager, Gas Works, Coventry	do.
*Tar Paving Works	Coventry Corp'n. Gas Committee	J. Price, M.Inst.C.E., Harb. Engrs' Off., 9 & 10, Lapp's-quay, Cork	July 19
*Excavating, Levelling, etc., at Foleshill	Cork Harbour Commissioners	do.	do.
Engine and Boiler for Popper Box	do.	do.	do.
Sand Pump Dredging Gear	Brentford Guardians	W. Stephens, Clerk, Union Offices, Isleworth, W.	do.
400 tons of Hard Guernsey Granite Spells	Lambeth Guardians	Clerk, Guardians, Gurd's Bldg. Offices, Brook-st., Kennington-rd.	do.
*Alterations, Infirmary, Brook-st., Kennington-rd. S.E.	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	July 20
*Additions, etc., to Belmont Asylum, Sutton, Surrey	Harrow-on-Hill U.D.C.	J. P. Bennetts, Surveyor to Council, Harrow	July 21
*1,000 tons of Broken Granite and Granite Chippings	do.	do.	do.
120 yds. of Coarse, and 150 yds. of Fine, Gravel	East Barnet Valley, U.D.C.	H. York, C.E., Surveyor to Council, Station-road, New Barnet	do.
Road Materials, etc.	Croydon R.D.C.	R. Masters Chart, F.S.I., Union Bank Chambers, Croydon	do.
*Add. Bed Pav., etc., Redington-cot. Isol. Hos., Mitcham	Essex County Council	F. Whitmore, Architect, Duke-street, Chelmsford	do.
*Sand Pump Dredging Gear	do.	do.	do.
Erection of a Police Station	St. Mellon's R.D.C.	Togamah Rees, M.Inst.C.E., Corn Exch.-chamb., Newport, Mon.	July 22
Waterworks and Water Mains, Marshfields, etc.	Belfast Harbour Commissioners	G. F. E. Giles, Harbour Engineer, Belfast	July 25
Caisson, etc., for Graving Dock, Belfast	Stockport Borough Council	A. Brunwell Thomas, Architect, 5, Queen Anne's-gate, S.W.	do.
St. John's Hall, Municipal Buildings, Stockport	Bishopthorpe R.D.C.	Messrs. Fairbank & Son, C.E., Leedal-chambers, York	July 28
Sewerage Works, Dringhouses	do.	A. F. Gutteridge, Surveyor, 9, Portland-street, Southampton	No date.
Painting, etc., Grammar Schl. Buildings, Southampton	Birmingham Corporation	G. Bolland, Church View, Hutton, Bedale	do.
Rebuilding of Cart-Shed	do.	J. Price, City Engineer, Council House, Birmingham	do.
Reconstruction of Feildy Bridge, Gough-street	The Trustees	J. W. Thompson, Architect, 63, Grey-street, Newcastle-on-Tyne	do.
Steel Work for Feildy Bridge	Leeds Education Committee	F. Bath, Architect, Crown Chambers, Salisbury	do.
Wesleyan Church, Kidderminster	Bo'ness Town Council	Borough Surveyor, Bo'ness	do.
Wood for Manual Instruction	Primitive Methodist Connexion	J. P. Earle, Architect, Norfolk-row, Sheffield	do.
Farm Buildings, Winterbourne Earls, Salisbury	Liverpool Select Vestry	Parish Offices, Brownlow-hill, Liverpool	do.
Cast-iron Water Main	W. Lee, Son, & Co., Ltd.	Manager of Works, Halling, near Rochester	do.
Church, Grenoside	do.	J. Russell, Architect, 22, Waring-street, Belfast	do.
136 yds. of Unclimbable Iron Fencing	Lancaster Lunatic Asy. Committee	Williuk & Thicknesse, 14, Castle-street, Liverpool	do.
Electrical Installation at Cement Works	do.	do.	do.
*Cement Pipes, Arrowrore Castle	do.	do.	do.
*Isolation Hospital, etc., at Lancaster	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Wimbleton U.D. Educa. Authority	4l. per week	July 7
*Assistant Civil Engineer	Civil Service Commissioners	Not Stated	do.

Those marked with an asterisk (*) are advertised in this Number.

Competitions, —

Contracts, lv. vi. viii. x.

Public Appointments, xix.

TENDERS.—Continued from page 27.

EDENFIELD.—For erecting a Conservative club, for the Edendell Conservative Association. Mr. F. J. Hobson, architect, Rawtenstall. Quantities by architect:—	
Billing Bros., Market-street, Edenfield, near Manchester	1672 0 4
FOLKESTONE.—For heating the town hall, police-courts, etc., for the Corporation. Mr. Reginald Pope, architect, Folkestone:—	
Haden & Sons	£438 0 0
J. Grundy	£317 0 0
Bliden	420 0 0
Darby & Co.	310 0 0
Smith & Co.	310 0 0
Griffiths & Co.	382 10 0
Musgrave & Co.	300 0 0
J. & F. May	380 0 0
Werner & Co.	297 0 0
Oyendean & Co.	366 0 0
R. Dawson & Co.	285 0 0
Whitlock	366 0 0
W. Fox	293 10 0
Strange	342 16 6
Jones & Son	253 12 6
Davis & Bennett	329 0 0
London	253 12 6
FOREST HILL.—For detached house, Louth Hill, Brookley Park. Mr. T. Morrison (Harrod), architect, Birkbeck Bank-chambers, High Holborn, W.C.:—	
A. J. Glock	£1,288 19 2
J. Roberts	£900 0 0
Thomas & Son	1,200 0 0
J. Bowen	790 0 0
Read & Will	1,200 0 0
A. W. Jaeger	700 0 0
W. F. Stevens	1,140 0 0
by-Bow*	700 0 0
Jones Bros.	1,100 0 0
* Without cellar.	
GRIMSBY.—For erecting new premises, fish docks, Grimsby, for the Great Grimsby Albin Steam Fishing Co. Ltd. Mr. E. C. Wainwright, architect, Grimsby:—	
Hewins & Godhard, Eleanor-street, Grimsby	£686
GUILDFORD.—For alterations and additions to the Holy Trinity and St. Mary's National Schools. Mr. W. G. Lower, architect, 124, High-street, Guildford:—	
Trice & Robinson	£2,400 0 0
R. Wood	£2,194
A. Johnson	£2,325
W. Smith & Sons	£2,147
Mitchell Bros.	£2,219
S. Ellis	£2,082
Higlett & Hammond	£2,197

GUILDFORD.—For road works (Wherwell-road, Testard-road, Leas-road, and Margaret-road), for the Town Council. Mr. C. G. Mason, Borough Surveyor, Tuns Gate, Guildford:—	
Wherwell-road.	
Cunningham, Forbes, & Co.	£310 0 0
G. A. Franks, Station Approach, Guildford*	270 9 8
Streeter & Todhunter	263 19 6
Testard-road.	
G. A. Franks, Station Approach, Guildford*	228 8 10
Cunningham, Forbes, & Co.	220 0 0
Streeter & Todhunter	192 2 6
Leas-road.	
Streeter & Todhunter	288 16 5
G. A. Franks	306 4 2
Cunningham, Forbes, & Co. Fleet, Hants*	291 15 0
Margaret-road.	
Streeter & Todhunter	204 17 0
G. A. Franks	177 1 3
Cunningham, Forbes, & Co. Fleet, Hants*	172 16 6
HAMILTON (Scotland).—For gates and railings for new cemetery, for the Parish Council. Mr. J. B. Brie, C.E., 136, Wellington-street, Glasgow:—	
J. Goudie	£281 12 9
Cameron & Co.	£213 0 0
P. McFlorie	212 6 9
J. Burdon	204 11 5
Sons	204 11 5
W. J. Mullings	196 7 6
E. J. Raybould & Co., Glasgow	183 10 6
J. A. Miller	241 3 4
T. B. Smith & Co.	182 17 8
Co.	237 6 0
Bryden & Co., Ltd.	220 8 10
Middleton	172 1 6
W. Bain & Co., Carlisle	200 1 2
HARLEIGH (Wales).—For constructing a reservoir with masonry dam, and laying pipes, for the Dendraith Rural District Council. Messrs. Foster & Co., C.E., Portmadoc:—	
W. Westwood, Bromyard, Worcester*	£1,229 7 1

HEREFORD.—For the addition of a class-room at St. James's School. Messrs. Nicholson & Hartree, architects, Hereford:—	
Beavan & Hodges	£418 10 0
W. P. Lewis & Co.	£320 0 0
C. Cooke*	308 0 0
[All of Hereford.]	
HIGH BENTHAM.—For erecting High Bentham Wesleyan Chapel and Schools, York-shire. Mr. J. F. Curwen, F.S.A., architect, 20, Highgate, Kendal:—	
Mason and Waller: Brassington Bros. & Corney, Settle, Yorks.*	£1,231 0 0
Carpenter and Joiner: J. H. Breat, Morecambe*	809 0 0
Plumber: W. H. Greenop, Bentham*	323 16 0
Slater: J. Jackson & Son, Bentham*	162 0 0
Plasterer: Anderson & Co., Morecambe*	89 17 10
Painter and Glazier: W. Holmes, Bentham*	135 10 0
£2,750 13 10	
HORNINGLOW.—For erecting a new Wesleyan Chapel, for the Trustees. Mr. C. W. D. Joynton, architect, Wednesday:—	
R. Kershaw, Burton-on-Trent*	£2,448
INVERTRIE (Scotland).—For providing and laying 1,750 yds. of 6-in. c.l. pipes, etc., and 250 yds. of freelay pipes, for the Town Council. Mr. Andrew Crockett, Burgh Surveyor:—	
J. McQuachie	£592 2 11
W. Leask	587 0 2
J. Laing & Sons, Inverurie*	563 13 4
LONDON.—For new premises, for the Kensington Motor Co., Ltd., Avonmore-road, W. Quantities supplied. Mr. H. Hardwicke Langston, architect and surveyor, 6, John-street, Bedford-row:—	
Leslie & Co., Ltd.	£2,950
G. Bolton	£2,684
Lole & Lightfoot	2,981
Mattock Bros.	2,568
J. Jarvis & Sons	2,836
F. & H. F. Higgs	2,530
J. Atley & Son	2,790
Mattock & Parsons	2,587
Ford & Waiton	2,540
Webster & Cannon	2,580
Ltd.	2,735
J. Greenwood, Ltd.	2,480
H. Young	2,688

LONDON.—For alterations and repairs at Workhouse Buildings, Arthur-street, Chelsea, S.W., for the Guardians. Messrs. Lansell & Harrison, architects, 66, Basilhall-street, E.C.—
 F. W. Harris £747 Spiers & Son £548
 T. Pearce 738 C. Moss 397
 C. W. Patten 615 J. F. Holliday, 37 &
 C. Wall, Ltd. 606 46, Anthony-st., E.* 387

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The Orthodox Cathedral of Famagusta, Cyprus.



FAMAGUSTA came into existence as a great medieval city of the Levant at the close of the XIIIth century.

In its beginning the town seems to have been a mere fishing village for long after the disappearance of ancient Salamis, two miles away to the north, or old Famagusta, as it was called in the Middle Ages. But in the early days of the Frank occupation of Cyprus this village became important on account of its natural harbour, and a fort was built to protect it. An Orthodox bishopric was established at an early date, and in its cathedral (which in all probability is the small Byzantine church at the side of the immense Gothic building, the subject of the present article) the remains of S. Epiphanius, Bishop of Salamis, were enshrined. This relic was venerated here until the close of the XVIIth century—that is to say, until the Turkish invasion. Hamendorf saw it here in 1564. (*Itinerarium*, 1621.)

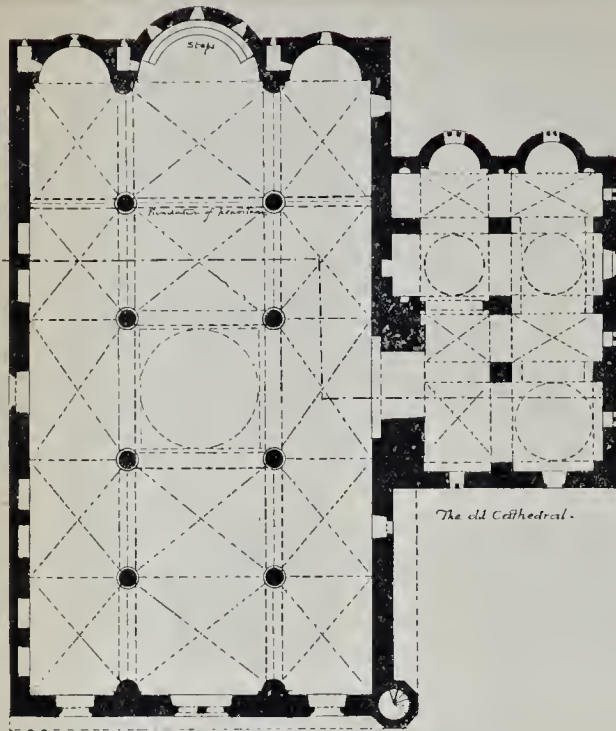
In 1291 the loss to Christendom of S. Jean d'Acre occasioned an immense impetus in the development of Famagusta as a stronghold and a centre for European commercial enterprise in the near East, and to the early XIVth century belong the extensive fortifications and the citadel which we see at present, as it were, through the earthwork

ramparts added by the Venetian engineers of 200 years later. The magnificent fosse hewn in the sandstone rock, a remarkable work of its kind and dating from the same period, would form the quarry whence the stone for the walls was obtained. As a means for contributing towards the prosperity of the city several pilgrimages were instituted about the beginning of the XIIIth century. Already the monastery of S. Barnabas was a recognised resort, and in addition the name of S. Epiphanius was associated with the new city by the shrine within the Byzantine cathedral already mentioned, and by a mysterious cave where miraculous water dropped from the rock, according to Stephen Lusignan, who mentions having witnessed the miracle.

The south-east quarter of the city appears to have been almost entirely occupied by the Orthodox or "Greek" section of the community during the Middle Ages. The northern and western portions appertained equally exclusively to the Latin, Nestorian, and Armenian population, whose churches remain in ruins, a melancholy evidence of once flourishing colonisation, whilst all traces of domestic or commercial occupation have entirely disappeared. In the "Greek" quarter several small Byzantine churches still survive. They are buildings of a small, unimportant character, their only claim to notice being in certain fragments of fresco still clinging to their walls. Towards the middle of the mediæval city, and probably marking the centre of the primitive fishing village, stands the

Orthodox cathedral. As already remarked, this small, insignificant Byzantine building may be of great antiquity, but, as in all Byzantine churches, evidences of age unsupported by historical or documentary proof are very deceptive. In the present case no details of architecture or sculpture present themselves for identification, and the general forms of the pointed arch construction afford very little clue. The building would appear to have been much repaired and added to at subsequent periods. At the present time this building is very ruinous, its tottering walls threaten to fall at any moment, and, considering its general faulty construction, it seems to stand as it is by a miracle.

The great Gothic cathedral or "Metropolis" of the Orthodox church in Famagusta is a very remarkable building from every point of view. Built on to the side of the little primitive Byzantine church above described, it completely overshadows and practically effaces its parent building. In addition to its immense size—unprecedented in Cyprus building of a native kind—several remarkable differences from the usual Byzantine arrangements are noticeable in the plan. In adopting the Gothic style of the XIVth century the Orthodox clergy seem to have waived several well-known prejudices of their church and allowed an unusual resemblance to the Latin peculiarities of plan and detail. As will be noticed in the accompanying drawings, the primitive cathedral consisted merely of two aisles, each terminated by a semicircular apse. These



The Cathedral, Famagusta. Plans.

would appear to have been a customary plan for an Orthodox church in Cyprus at an early medieval period. The two apses are arranged one for the altar proper, the other for the "altar of prothesis." Both altars are necessarily concealed behind the gorgeously decorated iconostasis. At a still earlier time churches were often covered by a large dome, like the early church in the castle of S. Hilarion, or at least a cruciform plan was adopted with a dome at the crossing.

The two-aisled plan is singularly characteristic of Cyprus churches, but during the XIVth century a change was probably brought about in ecclesiastical taste by the building of so many splendid cathedrals in the Latin or European style by the French and Italian master masons settled in the nearer East during that period. The Orthodox community, seized with a spirit of emulation, attempted to rival the superb cathedral of Famagusta, built in 1311 by Archbishop Bandoïn Lambert for the crowning of the putative kings of Jerusalem. The more usual two-aisled plan was abandoned for the imposing triple division of the mediæval church as imported from Europe by the Crusaders.

Another great church in Famagusta, known to the Turks as "S. Nicholas," was also built about the same time as the Orthodox cathedral. Although much smaller in scale, it resembles the Orthodox cathedral in such a remarkable manner as to seem merely a replica. Thanks to a rather more robust construction, smaller proportions, and a situation farther removed from the Turkish

batteries of 1571, this church remains at the present day in a remarkable state of preservation. The well-preserved interior affords to an experienced eye an excellent idea of what the now completely ruined Orthodox cathedral must have been like; but in the latter case, however, the fresco decorations still form a remarkable feature, which is completely wanting in the "S. Nicholas" since its conversion into a mosque. In most buildings of this type it is difficult to judge of the original intention of the designer owing to the removal of the fixed furniture, and particularly of the iconostasis. No Latin church was built during the Middle Ages without its high "jubé," or rood-screen, and no Orthodox church then or now could be constructed without its iconostasis completely covering up the east wall, which in no case was ever intended to be visible. As a consequence the eastern walls of Byzantine churches always appear singularly mean and uninteresting when laid bare and naked by the removal of the screen. On the other hand, the lantern-like apse of a Latin church, with its choir enclosure forming almost a church within a church, remains architecturally interesting even when denuded of its screens in the taste of modern days.*

The Orthodox cathedral was built of

* Attempts have been made to identify "S. Nicholas" (now used as a grain store) with the church of SS. Peter and Paul, which, according to Stephen Lusignan, was built by one Simon, a merchant of Famagusta, out of the proceeds of one successful trading voyage. This story is somewhat suggestive of the popular mediæval romance of "Whittington and his Cat" type, and the assumption that the "S. Nicholas" of the Turks is SS. Peter and Paul of the legend is too hypothetical, and rests on practically no evidence. The dedications of the ruined mediæval churches of Famagusta can only be identified in a very few instances.

regular coursed masonry neatly cut in the best style of Latin building, and singular contrast with the wretched workmanship of the average villa church of Cyprus. Mouldings and carv details are the same precisely as those of the Latin cathedral and churches of the XIVth century, and it is evident that mason-craft of all these monuments is identical. European masons and sculptors were certainly employed on the Latin cathedral of 1311; if European workers were not engaged for the Orthodox building, we must suppose that native artisans had assimilated western ideas of work and craft in a very remarkable manner. Such neatly-jointed stonework, carefully-executed vaultings, elaborate mouldings to arch or window are hardly to be found elsewhere in buildings of the native Cyprus church.

It may be concluded from the plan that in all probability a donical lantern was constructed in the middle of the nave vaulting. This feature, so beloved of Byzantine architects, probably added the unsubstantial constructive character of the church, and assisted in the general downfall of the vaulting at the time of the bombardment in 1571. Only at the north-east corner of the ruin does a fragment of the original vault remain at the present day in a most precarious condition.

Two very remarkable resemblances in the plans of the two cathedrals—"Latins" and "Greeks" remain to be noticed. In spite of the well-known aversion of the Orthodox to interment within their churches, the "Greek" cathedral has been originally planned for building by means of the peculiar western mode of "founders' tombs." That is to say, the means for the purpose were provided by persons who claim the right of sepulture within the church. The walls of the cathedral were occupied with doorways are constructed to receive "founders' tombs," and the method of construction has unfortunately tended towards the destruction of the building, as in so many other churches in Cyprus. In the Latin cathedral there are also "founders' tombs," but they have a comparatively small influence on the stability of the edifice. In the "Greek" cathedral and in the Latin churches these tombs are introduced in such a manner as to completely cut away the main strength of the church walls. As a sign of date, the "founders' tombs" may be taken to represent the last years of the XIVth century. The system was of Italian origin, and rapidly spread over Christendom as an easy way of erecting churches in the days before "bazaars" and other modern means for the purpose. The second peculiar resemblance between an Orthodox cathedral and the Latin type of plan is the presence of small sacristies or treasuries leading out of the eastern apses. In the Orthodox ritual there is no necessity for a distinct external sacristy: the space of the "prothesis" occupies the place. Why should these unusual features have been introduced? Perhaps we may be allowed to see in these resemblances the adoption of the Gothic style so evident of that *rapprochement* between the two branches of Christianity which

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is considered within practical politics the beginning of the XVth century. Identification of date in mediæval building in Cyprus is a very difficult and certain study. The methods of work of mason-craft seem to have been full archaisms at all periods. Naturally it arises from local workers being employed in copying a foreign style for which they had no natural affinity. For instance, the singular chevron or zig-zag decoration to doorways, which in Europe is a distinctive feature of the earliest transitional style from Romanesque to Gothic, is in Cyprus continued in use through the mouldings of the XVth century period. It seems possible for various reasons to suppose the Orthodox cathedral a building of the XVth century and much later replica of "S. Nicholas," as a sculpture on the latter seems to be of XIVth century style.

Although in the last stage of ruin, its steeple gone and a great part of its walls, the Orthodox cathedral still possesses a remarkable series of frescoes on such portions of the interior as still stand erect. The three eastern apses are intact, and their semicircular walls are decorated with a series of paintings in rows one above another. These paintings are of very inferior character, and have a great resemblance to the common XVth century frescoes executed by itinerant artists for village shrines in Italy. The lowest row of figures represent apostles and doctors of the Orthodox church. This series is carried around all three apses. At a higher level a series of New Testament subjects, scenes from the Passion, etc., treated as figures within a decorative framework in the common Italian manner, are painted. The semi-dome over each of the apses is of course filled with dim traces of the usual colossal figures representing a "Majesty" or "Paradise." More interesting paintings are, however, to be found on the side walls of the church over the "founders' tombs." In one or two cases these are remarkably well preserved. They form panels continued upwards from the arched recess in the style of the tombs in the "Frari" church of Venice. These "founders' paintings, being doubtless commissioned by individuals, are of a very much superior type compared with those which cover the eastern wall of the church. The solid, well-built walls of the cathedral have retained their plaster and these frescoes in a most remarkable manner, in spite of the vandalism of the past three centuries and the overwhelming destruction always resulting from the fall of a vaulted ceiling. Perhaps their preservation may be partly due to the way in which the walls were first covered with a very slight coating of plaster, which naturally has a better chance of surviving than a heavy layer of "intonaco," as was often used in the Middle Ages in Italy.

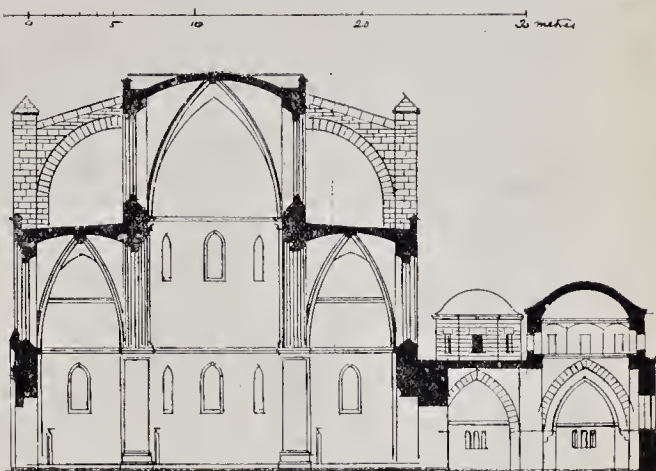
This church must have presented a very remarkable and magnificent appearance when it stood complete with its elaborate carved and gilded furniture of the later mediæval style. It apparently possessed a wood iconostasis, the traces of a stone base for which remain at the pavement level of the sanctuary. The Bishop's throne would

also be a wooden erection, and would be on the outside of the iconostasis, in a position similar to that of the patriarchal throne in the "Catholicon" of the Holy Sepulchre at Jerusalem. In endeavouring to realise the former appearance of this interior, a problem is presented by the space which in an ordinary Orthodox church is occupied by the stalls or seats ranged around the church for the convenience of aged members of the congregation being in this case devoted to wall-tombs. We must suppose these very usual and, indeed, necessary adjuncts to a church were arranged in the form of a choir in an English cathedral.

The church is a most interesting example—perhaps almost unique as a positive design—of the mixture of Eastern and Western ideas in plan and detail. Not the least curious thing to observe in its hybrid character is the fact that in spite of a certain incongruity, perhaps inseparable from such attempts to adapt the details of one style to the

plan and proportions of another, in the present case the result, as far as can be judged from the ruins, was imposing and satisfactory. The still perfect church of "S. Nicholas" has a remarkably fine internal effect, even in its present mutilated condition. We can judge by comparison that its larger neighbour was proportionately finer. The central lantern added to the Orthodox cathedral would perhaps have had a somewhat mean appearance in the interior view. It appears small in proportion to the general scale of the church, much in the way that the lanterns over the crossing of Milan Cathedral and many other Gothic churches of large size appear small since our eyes have been accustomed to the more liberal proportions of the domical churches of the Renaissance. And in addition this Gothic-Byzantine lantern in Famagusta had not apparently the satisfactory position of crowning a crossing of nave and transepts.

Few, if any, records remain of the history of the Orthodox cathedral of



CROSS-SECTION ON LINE A-A.



WEST END ELEVATION.

The Cathedral, Famagusta: Elevation and Section.

Famagusta. Stephen Lusignan ("Corografia," p. 31) states that in 1212 the Pope Innocent III. sanctioned the formation of a Greek Archbishopric in Nicosia (translated from Famagusta) and of three Bishoprics of Famagusta, Paffo, and Limassol. A few years later, however, Pope Alexander IV. made an ordinance, called the "Alexandrine," by which the three Bishops were not to reside within their titular cities, and the Greek Bishop of Famagusta was directed to reside in Riso Carpasso. By a strange anomaly the Greek Bishop seems to have been enthroned in the "Chiesa Cattédrale de' Greci" by the Latin Bishop of Famagusta, and took on this occasion the oaths of fealty to the Pope of Rome. This curious ceremony is fully described by Stephen Lusignan, who seems to have acted on occasion as Latin Vicar-General for the purpose.

After the destruction of Famagusta by the Turks, the "Greek" cathedral is mentioned as being confirmed together with the Chapel of S. Symeon to the Orthodox community, which had permission to remain within the ruined city. This could not, of course, be the church which has now been described, as there is every reason to suppose it must have been reduced to the condition in which we see it at the present day by the Turkish bombardment. The marks of iron cannon-balls on the ruin and the close vicinity of the site to the side of the city most exposed to the Turkish batteries suggest this. Perhaps the church of "S. Nicholas" sometimes confused with the cathedral may have been constituted the "Metropolis" of the city at this period, but this church seems to have been taken away from the Orthodox after the year 1600 and converted into a mosque. It is now a granary.

In 1901 M. Enlart, the author of "L'Art Gothique et de la Renaissance en Chypre," attempted some small excavations of the Orthodox cathedral, and discovered the two rows of steps in the central apse. This peculiar feature is unusual in buildings of the last few centuries, and of course reminds the student of the primitive Byzantine arrangement. There does not appear to have been any episcopal throne provided for in this form of presbytery such as we are familiar with in examples of churches of the XIth century in Europe. It was perhaps a mere surviving ritual feature, like the similar arrangement of comparatively modern Coptic churches in Egypt, and indeed the two steps are almost too narrow to allow of their having been used by the priests. M. Enlart also discovered some interesting traces of the method of glazing employed in this church during his excavation. Amongst the debris were immense quantities of broken window glass of various colours. On investigation these proved to be remains of roundels which had been set in a peculiar framework of plaster of Paris, a system which is represented to some extent at the present day by the mosaic-like windows of Turkish mosques, which are also worked in the same way with a coarse setting of plaster. These roundels were about 8 in. in diameter, of a very poor quality of glass—imperfect white, deep blue, green, and purple in colour. A few fragments of

marble mosaic from the flooring were also turned up. Most of these remains are now in the little museum at Famagusta.

The Orthodox Metropolis stands in a most interesting condition for study and exploration. With the exception of M. Enlart's researches nothing seems to have been touched within the ruins for centuries. Much of the stone on the outside next the road has probably been removed, but speculators in secondhand building stone have not yet penetrated very far into the mass of fallen vaulting which fills the interior. This mass looks as if it lay as it fell in at the time of the Turkish siege, and under such debris much of interest may still be buried.

Sketches of this building were made by Mr. Vacher in 1883 for a paper on "Medieval Buildings in the Island of Cyprus," published in the *Transactions* of the R.I.B.A. These sketches are somewhat inadequate to give an idea of the scale of the building, but the plan is a carefully-measured one; unfortunately the communication between the two churches is not shown. M. Enlart gives some excellent sketches and photos in his great book on the architecture of Cyprus, but his plan also requires correction in one or two particulars. A really complete and exhaustive set of drawings of the cathedral cannot of course be made until the whole of the interior is freed from the mounds of fallen masonry, which at present reach a height in places of 6 ft. to 8 ft. This would be an interesting enterprise on the part of any archaeologist with time to spare for superintending the always slow and tedious operations of Levantine labourers.

THE HELLENIC SOCIETY.

It was a happy thought to celebrate the twenty-fifth year of the foundation of the Hellenic Society by a special commemorative meeting. It was an occasion both for bringing to the notice of the outside public some idea of the manner in which the Society has progressed since its small and tentative commencement in 1879, and of the work which it has accomplished in promoting the intelligent study of Greek archaeology, literary and artistic; or more especially, one may say, of the fruitful combination of literary with archaeological study.

For in this respect the foundation of the Hellenic Society came at what one may call the psychological moment, when students of things Greek were just beginning to perceive that the study of Greek literature apart from the actual remains of Greek architecture and art was only a one-sided method; that the literary and the artistic remains should be taken together and studied in combination if we were to arrive at the best and most comprehensive understanding of Greek culture and of the lesson that it has for mankind. It might be difficult indeed to say whether the formation of the Hellenic Society was the consequence or the cause of this wider view of Hellenic study; perhaps it may be said to have been both. Its formation was due to this wider perception on the part of a few persons, but it has been the means of promoting the adoption

of the same view in the minds of many persons. It commenced with 112 members; it now numbers 850. Its *Journal*, commenced also in a tentative manner and with some doubt as to its future, has now become a recognised storehouse of papers valuable for critical learning.

Sir Richard Jebb, who occupied the chair at a meeting which entirely filled the Society of Antiquaries' meeting-room, naturally paid a high tribute to the late Sir Charles Newton, to whose exceptional learning in everything connected with Greek archaeology the Society was so much indebted during its earlier years, as well as to his enthusiasm in the cause, not less genuine because it was not popularly demonstrative; in fact, Newton was not one who cared or endeavoured to appeal to the popular mind at all; he addressed himself to those who already had some knowledge of and interest in his special subjects. Sir R. Jebb quoted Ruskin's remark, in his characteristic language, as to Newton's "intense and curious way of looking at things," a phraseology which exactly described his attitude of mind. And it was to Newton that the Hellenic Society was indebted for starting with the broadest view of what Hellenic study was to include—everything that was Greek, of any age and in any country where the restless Greek spirit had demonstrated its existence by either literary, or architectural, or sculptural remains. To have confined its investigations to the great period and the great shrines of Greek art might have been to lose discoveries of the greatest historical interest.

One point which was brought out by Sir R. Jebb was the manner in which the Society had brought the Universities more in touch with the British Museum. Previous to its formation, as he truly observed, work was being unostentatiously done by students connected with the British Museum, in comparison with which the study of the same class of subjects at Oxford and Cambridge could only be regarded as elementary; and of these students in the recesses of the great museum the Universities knew little or nothing. The Hellenic Society, of which the most accomplished of the British Museum men became members, brought them and their work into the light of day; they became known authorities on their respective subjects; and most of them being also University men, a new perception arose in the University world as to what thorough archaeological study really implied. The papers published in the *Journal* of the Hellenic Society fully illustrate this high standard of archaeological investigation; there is hardly one of them which is not an example of special investigation, in which nothing is taken for granted, and in which in most cases some new point is brought out.

The presence of two eminent American scholars, Professor Gildersleeve, of the Johns Hopkins University, and Professor J. Williams White, the President of the Archaeological Institute of America, was an agreeable incident at the meeting, and we have no doubt that the two learned visitors were personally quite sincere in their appreciation of the labours of the Hellenic Society and in

their wish that the bonds of amity and union between English and American archaeologists should be drawn closer. Nevertheless, we cannot shut our eyes to the fact that American archaeologists, as a class, seem decidedly anxious to work for their own hand, and produce the impression, whether correctly or not, of being in general exceedingly jealous of English archaeologists; we have noted more than one case lately of refusal, in American hooks, to recognise or give credit to English archaeologists; even cases where, though an English archaeologist's work could not but be recognised, his name was suppressed. This is not a pleasant feature in the attitude of American archaeologists, and complimentary speeches at meetings will not quite atone for it.

But the address of the afternoon was unquestionably that of Mr. Gennadius, the former Greek Minister in London, in whose official rooms the idea of the Hellenic Society was first, we believe, started. He rose quite above the platitudes of the occasion, into the region of philosophic thought. If any outsiders ask—as they do sometimes—why there should be this machinery for the study and elucidation of things Hellenic, Mr. Gennadius supplied them with the answer. In language of great eloquence and beauty he dwelt on the value of Greek literature and Greek art as a means of supplying the highest form of culture to the modern mind; he reminded his hearers how many great English statesmen had owed their breadth of mind to the influence of Greek literature; how sane and wholesome was its influence; how important its recognition of beauty in life as opposed to mere material progress; and how much a recently deceased great philosopher might have gained in breadth of sympathy and in calmness of judgment had his mind been steeped in the influence of Greek language, literature, and art, instead of merely having what might be called a scoffing acquaintance with Homer through the medium of a hastily examined English translation. That is the true view to take of the value of Greek culture to us; it holds up a higher and saner standard than that of our hurried modern life. One can fancy how the Greeks would have abhorred the kind of thing which is called "art nouveau."

NOTES.

By the death of G. F. Watts we have lost the last of a great trio of English painters who have left no one to succeed them on the same artistic level; for whatever differences of opinion there might have been as to the art of Millais, Leighton, and Watts, and as to their relative greatness, there can be no doubt that they represented, each in his own way, a power in painting in which they have at present no successors. Burne-Jones could not be grouped with them, for his genius, beautiful as it was, moved in a more limited area. By many persons Watts will at present be regarded as the greatest of the three, on account of the poetic and moral aim which he kept before him, in his later works especially. But it

was this moral aim which constituted his weak side as an artist. When once you begin to give a predominant importance to the moral of a work of art, the art is likely to suffer in proportion, and in many of Watts's later works did suffer to a painful extent. In his "Love and Death," perhaps his greatest work, he still preserved the balance; it was a painting with a great intellectual meaning, but not with a moral in the ordinary sense of the word. "Love and Life" was a painting with a distinct and pronounced moral, and was proportionately weaker as a picture. His works of this class will hardly retain in future the same interest which for many they now have. Watts's future greatness will rest on the works in which beauty, of colour and form, was predominant, not excluding poetic meaning; on his "Daphne," "Love and Death," "Hope," "Endymion," "The Infancy of Jupiter," and other such works. As a master of the mystery of colour he was hardly surpassed, in his best works, by any painter, ancient or modern; while his power of original conception was shown in such dramatic figures as his "Jonah" and "The man who had great possessions"; and his few landscapes seemed each to illustrate a new "note" in landscape painting. He produced many interesting and some great portraits—among the latter his "Tenyson" and "Herr Joachim" especially; but his portraits tended to become, in a good many cases, not so much likenesses of his sitters as his conception of what they ought to look like. Of his grand simplicity of character and total absence of covetousness in regard to either honour or gain too much cannot be said. He regarded himself always as one striving after an ideal rather than as having attained. "Well, here you find me," he said to a lady visitor at his studio, "still trying to paint a little." The modest sentence was an epitome of his whole life and character.

At the annual meeting of the Palestine Exploration Fund, held on Wednesday at the Royal Institution, Sir Charles Wilson gave an account of the work that had recently been done and which was immediately in prospect, followed by the exhibition of an interesting series of lantern slides illustrating recent and present work, more especially at Gezer, where Mr. Macalister is engaged in explorations from which much of interest has been obtained and more is expected. But the *firman* permitting excavation expires in fourteen months from now, and both Sir Charles Wilson and the chairman (the Duke of Northumberland) impressed on the members and friends of the Fund the importance of raising sufficient money to make the best of the opportunity while it lasts. Other countries, Germany and Austria especially, are now actively engaged in the field of Palestine exploration; and it is almost needless to add that these explorers receive substantial assistance from their respective Governments, while from ours none can be expected; all such expenditure being evidently, in the eyes of the English Treasury, "waste of public money." Among the discoveries

recently made are a considerable number of remains of children evidently sacrificed from some superstition at the erection of a building—hurled at or under the base of a wall. The evidence of this kind of ruthless practice among the Canaanites of the early time throws a new light on the fierceness of the denunciations of the heathen in the Old Testament chronicle.

Training Colleges. THE executive council of the County Councils' Association have adopted a Report, prepared by a committee, which may have some bearing upon the building and planning of training colleges in the future. The committee framed the outline of a scheme for a one year's course in a training college where the students should, as the committee recommended, be supplied with facilities for acquiring, with other things, the practice as well as the theory of education, and instruction in physical exercises, wood-working, cookery, black-board drawing, and elementary experimental and natural philosophy. The committee also recommended that all local educational authorities should provide facilities for the training of selected teachers who have not passed through a training college course in educational methods.

Inhabited House Duty. WHAT renders a house "an inhabited dwelling house" within the meaning of the House Tax Act, 1851, has just been the subject of a decision, *Smith v. Dawney*. A dwelling house fully furnished, and with the furniture in place, remained unoccupied for a whole year. It was occasionally aired by an agent, and the garden was kept in order, but nobody had slept there, and the question was whether in such circumstances the lessee was liable to be assessed for inhabited house duty. An impression has prevailed that the test to be applied is whether the house has or has not been slept in, and in some cases the words of the section "inhabited dwelling house" have been construed with reference to this test, but in the present decision a much wider construction has prevailed. This statute took the place of the statutes which imposed the window tax, and it contains a reference to the former Acts. In these Acts the words used were occupation as distinguished from habitation, and the Court has now construed the word "inhabited" as though the word "occupied" had been used in the section, and as a consequence the house being kept in a state fit for occupation, ready to be slept in, has been held to render it "inhabited" as distinguished from buildings not capable of being occupied as dwelling houses, such, for instance, as those used for classrooms or as gymnasiums. This furnishes one more example of the unsatisfactory results attending legislation by reference. Every Englishman is presumed to know the law, but he might as well be presumed to be able to fly as to understand the Statute law. In the present case the word "inhabited" has a well-understood meaning, and the puzzled householder may be excused if he asks why, if the law meant to convey "occupied" as it had said in former statutes, the same word

was not used in the statute dealing with the same subject matter. We can only refer him to Shakespear.

**Covenants
on Sale
of Freehold.**

THE Court of Appeal in the case of *In re Poole and Clark's Contract* were recently consulted as to the proper form of covenant to be entered into by the purchaser of freehold property with the vendor when the latter held the property subject to restrictive covenants, and the Court laid it down that the covenant should be prefaced by the words "with the object and intent of affording to the vendor a full and sufficient indemnity, but not further or otherwise." The object of such a covenant is only to secure the vendor from any action brought against him by persons alleging that they have suffered damage by a breach of covenant, and the insertion of these words prevents him from obtaining an injunction against the vendee except when he has been so sued, as otherwise no interest in the property remains in him.

**The Municipal
Electrical
Association.**

MR. T. P. WILMSHURST delivered an interesting presidential address to the Incorporated Municipal Electrical Association last week. His remarks on the companies which are prepared to supply power in bulk to corporations show that municipal engineers regard the sphere of these companies as being confined to the supplying of factories, country mansions, etc., which are outside the reach of local municipal or company supply. They strongly resent the attempts that are being made in Parliament to obtain terms and exemptions for these companies which are denied to municipalities under the Electric Lighting Acts and their provisional orders. For instance, under the Electric Lighting Act of 1882, the undertaker, subject only to certain very limited safeguards, must supply anyone who makes a demand for the electric light. The power companies, however, are seeking to be relieved of this obligation. The President congratulated municipal engineers on the rapid growth of municipal electric supply undertakings during the last eight years. The total capital expended in these undertakings has increased during these years from four millions to forty millions. A considerable portion of this increased capital is due to the numerous municipal electric tramway schemes. The importance of enabling the consumer to enjoy the maximum possible light with the electric current supplied him was rightly insisted on. Mr. Wilmshurst was not of opinion that the duties of a supply company stopped at the meter. He said that companies ought to test glow lamps free of expense. They ought also to have inspectors who could advise consumers how to obtain the maximum light for the units they consumed. The company would be well repaid for the slightly-increased expense. Parliament has recognised that the providing of lamps of good efficiency is within the domain of "electricity supply." In some recent Local Acts a clause has been inserted authorising municipalities to "sell, let on hire, and otherwise deal with electric lamps." Glow lamp testing is very much simpler than gas lamp testing, and at a central station it could

easily be carried out during the night shift. The importance of the offer of cheap electric power in inducing manufacturers to settle in towns was also pointed out, and this phase of municipal rivalry is worthy of the consideration of municipalities.

**Thames
Steamboats.**

A CIRCUMSTANCE which particularly attracts the attention of visitors to London, but which now escapes the attention of most inhabitants of the Metropolis, is the absence of river steamers on the Thames. Those who live in the great city are a singularly patient and docile race. They know there used to be, and ought now to be, a regular service on the great highway provided by nature, but there is no public agitation on the subject. The omnibus or underground railway is cheerfully accepted as a substitute. At the present time the steamboat company, owning or leasing certain piers and possessing a fleet of peculiarly antiquated craft, cannot afford to maintain their service because it is not likely to pay, and the County Council has not yet authority to establish a modern service. This reproach to London will, it is to be hoped, shortly be removed, for the County Council Bill has already been passed by the House of Commons, and is now under the consideration of a Select Committee of the House of Lords. When this measure has been finally sanctioned, Londoners will have at their disposal, without unnecessary delay, a fleet of thirty specially-designed steamers giving a regular and punctual service all the year round between Hammersmith and Greenwich; and although ratepayers may suffer somewhat at the outset, there is no doubt that the gain to the community will be very great.

**The
United Service
Club,
Pall Mall.**

It is announced that the members of this Club have obtained the consent of the Commissioners of Woods and Forests to a renewal of their lease for a further period of sixty years, and that they are resolved to carry out some structural alterations of the premises. The clubhouse was erected in 1826-8 after Nash's plans and designs as part of the improvements he effected in Pall Mall and Waterloo-place; the enlargement on the east side was made by Burton. Whilst, in the matter of its design, the building scarcely does justice to its position, the outward appearance of the structure by no means belies its general reputation as being one of the most commodious and comfortable club-houses in that quarter of the town; it possesses moreover the uncommon advantage of a long return frontage to a wide open space which is comparatively but little used for vehicular traffic.

**Changes at
St. George's
Circus,
Southwark.**

It is stated that the Obelisk is about to be removed from the centre of the Circus to a fresh site in Waterloo Bridge-road, and that it will be replaced by an illuminated clock-tower given by a firm who have traded as tobacco merchants during a long period in the Borough. The Obelisk, a block of limestone, stands at the junction of five main roads on a spot which is distant one mile from

Westminster Hall, 1 mile 40 ft. from London Bridge, and 1 mile 350 ft. from Fleet-street. It was set up in the reign of St. George's Fields in 1771 in honour of Alderman Brass Crosby, who when Lord Mayor in 1770-1 achieved some celebrity by his confinement in the Tower for having released a printer whom the House of Commons had illegally arrested, and for sending a messenger of the House to prison. In the Circus stood until some months ago the buildings of the School for the Indigent Blind (since rebuilt at Leatherhead), which was first established at the former Dog and Duck tavern in St. George's Fields in 1799. When those premises were taken thirteen years afterwards for Bethlehem Hospital the governors of the charity acquired a site at the Circus, whereon, and on some adjoining land, they built a school for 220 inmates in 1834-8, after designs in the domestic Tudor style by John Newman (see the wood-cut, with the obelisk, in the *Mirror* of February 21, 1835). The school and its site were purchased for 140,000*l.* for purposes of an electricity generating station by the Baker-street and Waterloo Railway Company, who obtained additional powers for an extension of their line from Waterloo Station to the Elephant and Castle, Newington Batts.

**Pictures by
Giovanni
Costa.**

Two or three fine landscapes by the late Professor Costa have been exhibited at the Royal Academy, but perhaps few people in London were aware what a remarkable painter he was until the exhibition of a collection of his works at the Gallery of the Society of Painters in Water-Colours. His works previously exhibited in London had rather a sameness of manner and subject, and at the Society's Gallery one was surprised by an unexpected versatility in subject and style. The first one in the catalogue, "Celi narrant Gloriam Dei," is a small landscape with a very powerful and broadly-treated sky, much more English than Italian in manner. No. 5 is a replica of or a study for, on a small scale, one of the finest of his Academy pictures, of which there is another and still smaller edition (No. 81). In these and other works we recognise a fondness for a particular type of foreground—broken-up hillocks with growths of rushes. This meets us again in one of the largest and most important pictures here, "On the shore near Ostia" (10). "The Carrara Mountains above Lercici" (66) is an exceedingly fine landscape, and illustrates also the artist's success in the introduction of foreground figures; the two here are quite a study in themselves, while keeping their place in the picture. He was fond also of introducing into his foregrounds a single figure carefully composed so that its lines should harmonise with the composition of the whole picture; there are several instances of this. "The Cork Wood by the Sea" (65) is in a quite different key from most of the others. Among others of remarkable power and originality are "A Roman Road in the Woods" (36); "Study from Natrre, Porto d'Anzio" (44); "The Mainland from Monte Circeo" (49), with a long row of admirably painted old buildings, and the star-like

flowers in the foreground; "The Ancient Port of Nero" (68); and the "Early Study" (153), with its beautifully painted masses of dark trees and the light in the sky beyond them. Costa's influence on Mason we are not surprised to hear of when we see such a work as "Landscape near Perugia" (61), which might almost be taken for a picture of Mason's; while the delicate "Tree Study" in pencil (134) recalls Leighton's "Lemon Tree." A small picture called "Study in the Roman Campagna" (113) is interesting for another reason—it so remarkably recalls some of the landscape backgrounds in early Italian art. "The Nymph" (94), a life-size nude study, shows another side of the artist's powers. Altogether it is a most remarkable exhibition, and enables Londoners for the first time to form an adequate idea of Costa's artistic importance.

The Leicester Galleries.

At the Leicester Galleries is a collection of water-colour drawings by Mr. W.

Lee Hankey, a good many of which illustrate a method of treating landscape which has become rather prevalent of late, in which outline and detail are rather evaded, and the effect is got by contrasted masses of warm colour. It is not altogether an effect after nature; it is the translation of nature into an artistic scheme; but a good deal of it is very interesting. Some of the figure subjects have much heauty or character, such as the mother and child in "When I began to love" (22), and the half-humorous half-pathetic one of the young cottage girl under the title "If I were loved as I desire to be" (64). The large picture, "It's the Child's Turn now" (30) is pathetic, and fine in composition, but might have been equally so on a smaller scale: the picture is too large for the subject and treatment. Among things that may be specially mentioned are "The Dinner Hour" (44), "Touring" (48), and "Go not, happy day" (49), a small picture of calm water, distant white cottages, and floating clouds. In an adjoining room is a collection of Mr. Raven Hill's clever drawings for *Punch*, excellent specimens of work in black and white; but it is a kind of art the interest of which depends as much on the humour of the descriptions or titles as on the drawing; the two have to be taken together.

The Montague Fordham Gallery.

MR. SPENCER'S collection of iron work at the Montague Fordham Gallery is interesting

for its excellent workmanship as well as for the originality of its design. One section of the altar rail for the Roman Catholic Cathedral at Leeds is shown, a design for a steel casket for the Cartwright Memorial, a shield for the Cambridgeshire County Council, and a collection of attractive household accessories, such as fire-irons, electric light fittings, lamps, and candlesticks. The workmanship throughout is substantial and sound. The sympathy of the workman for the material is such that will delight architects, who nowadays often find it hard to get a simple piece of smith's work done showing any combination of hand and eye. In this respect, however, Mr. Spencer's more ornate pieces of work

are open to adverse criticism. Rough tool marks are well enough on simple smith's work, but elaborately designed work should not depend on this kind of effect. In Florentine metal work, for instance, the most beautiful effects depend on the great imagination in the design—based on the severest constructive lines—and on great delicacy of execution; the result of the finished article is satisfying in all respects; it is evidently hand-made, but that is only one of its charms. At the same gallery Mr. Adams shows some fine water-colour drawings, delightful in decorative quality, colour, and imagination.

ARCHITECTURE AT THE ROYAL ACADEMY.—V.

THE examples of ecclesiastical architecture at the Academy do not reflect any great activity in important church building, and although the exhibits are numerous, and many of them excellent, they represent almost entirely, works on a small scale.

The Liverpool Cathedral Competition accounted for much wall space in the architectural room in 1903 and is echoed in the present exhibition in No. 1600, an interior view of Mr. W. J. Tapper's design. We commented favourably upon this scheme in reviewing the competition drawings in our issue of May 30, and we published Mr. Tapper's design on June 13, 1903, but the present illustration, which is one of the best in the room, gives a more lucid idea of the author's aim at obtaining his principal effect from a mighty expanse of clearstory window. It also conveys a clear impression of the appearance of the eanted ends of the nave leading up to the narrow choir, which was the bold stroke in a very good plan. In contrast with this gigantic conception, Mr. Tapper also exhibits the "Interior of Memorial Church at Malvern Link" (1591), a very quiet treatment of a simple subject in which an arcaded clearstory is pleasingly introduced.

Mr. W. H. Seth-Smith sends an interior of a "School Chapel in Oxfordshire," which, although designed in good taste, appears to want greater provision for light and air—an important element where present-day youth is concerned.

"St. Matthews' Church, Auckland, N.Z." is an interior with a good stone treatment designed by Mr. F. L. Pearson (1417). The stone arches spanning the nave at short intervals are carried up to the underside of the tiebeams, above which rises an open timber roof. The abruptness of the finish to the stonework is not satisfying, and indeed it is not clear why these walls should be employed unless for acoustic reasons. The four lancets at the west end are not happy. No. 1452 is a design for a town church by Mr. C. Wontner Smith in which much good Gothic detail is seen, particularly in the tower. The smaller parts of the ground story will, however, improve under a more heavy treatment. "The Church of St. Chad, Longson, Stafford" (1506), is an edifice of no great interest shown by a dull drawing wherein the tower and broached spire appear to overwhelm the parts reserved for worship. There is a lack of design in mass, detail, and proportion, and the windows are very poorly managed. We are accustomed to more thoughtful work from the author, Mr. G. C. Horsley. The "Congregational Church, Dover" (1510), by Mr. F. Newman, is unassuming and is blessed with an end window of a present-day popular type. This consists of a large arched opening containing two heavy mullions or buttresses, around which ordinary stone tracery is grouped; it is neither constructive nor graceful in the presence of the arch. "Interior of the Church of St. Crispin, Poonah" (1515), is interesting, although no plan is given by the author, Mr. J. N. Conper, in that there is an attempt to blend Eastern detail with Western medieval forms. Mr. Geoffrey Lucas, who is responsible for many of the excellent line drawings shown in recent exhibitions at Burlington House, contributes a charming design for a "Hillside Chapel" (1527, wrongly described in the catalogue). The plan indicates that a small vestry, covered with a pent roof, is placed below the east window, and that at the end of the nave space is allowed for a porch and font. The eaves of the roof is brought down as low as possible and is only broken by a small twin gable containing two south windows;

a panel with a figure subject occupies the central space, continuing the lines of the windows, and the whole feature constitutes a delightful part of the scheme. At the west end stands a small tower with battered sides, a battlemented parapet, and a neat spire. The tower rises in the plane of the west wall, which we think is a mistake; it is more satisfactory to find the lines of such features continued to the ground, and not disappearing in the surrounding walls or behind roofs. This is, however, a minor point in what is a charming design, simple yet thoughtful.

Another successful little church, "St. Michael and All Angels, Woolmer Green, Welwyn" (1528), hangs immediately below the subject to which reference has just been made. The tower placed on the north side gains in importance by standing well away from the body of the church and bears out our previous remarks. Brick is the general material employed, whilst a sparing use of stone is made in some of the dressings to doors and windows. There is an air of restraint in the detail and in the large wall surfaces; but perhaps the most attractive element in the design, of which Mr. R. W. Schultz is the author, is the excellent proportions. No. 1554 is "Proposed Church at Wolverhampton," by Mr. P. L. James, which seems to occupy an island site, but the extreme thinness of the tower and certain other points occasioning adverse criticism do not render the design worthy the position. The "Holy Trinity Mission Church, Tulsa Hill" (1544), designed by Messrs. Treadwell and Martin, is a small brick and stone edifice in which the generous masses of the roof are effective. "West Front" (1566) is a terse title of a very indifferent design which has no claim, in our opinion, to a place on the walls of the architectural room. A very ambitious attempt is made in a design for "A National Crematorium and Hall of Deposition" in No. 1556, for which Mr. W. G. Mitchell is responsible. The diagram plan is too minute to be read, but the effort to apply classic detail to Gothic forms, which is clearly shown, is illogical. Take, for instance, the long, narrow buttresses of the tower, which are converted into tremendous pilasters by the use of Ionic caps. Observe also the introduction of stone tracery in semicircular window-heads. This tinted scale drawing has, however, an air of dignity; but surely in a structure peculiar to present-day requirements the mongrel application of traditional forms is incongruous.

The development of British possessions in Africa is naturally expected to produce important works in architecture. We have already reviewed some good buildings to be erected in Johannesburg, and we now proceed to a comparison of two churches intended for distant parts of the "dark continent." No. 1542 is an interior view of the "New Cathedral, St. John's, Umtata, S.A.," designed by Mr. C. H. Fellows Prynne, which at once strikes us as being substantially similar to other works in the home country by the same architect. Here is a stone-built church, having arcades, windows, and other parts bearing a strong impress of English medievalism, together with Mr. Prynne's favourite feature, a large pierced stone chancel screen rising towards the roof, and which becomes the dominant note in the conception. The detail is of a very ordinary description, and whatever influences were at work, it is possible to translate symbols and structural details into honest terms befitting the climatic and other conditions of the occasion. We cannot help thinking that, in spite of the raw state of the country and of the claims of ritual, this experiment is utterly wrong. Now the "English Church, Entebbe, Uganda" (1655), although very much smaller in its aspirations, is truthful in that it aims primarily at being a product of the country, and in the fact of its suitability to the needs of the climate. Professor Beresford Pitts illustrates his design by plans, elevations, and sections drawn to a good scale in a very clear manner. The church comprises nave with aisles, an apsidal chancel, organ chamber, vestry, a bell tower, and two porches, whilst the entrance end is approached from a garden enclosure having a simple cloister around three sides. To moderate the effects of a strong sun, a verandah, or stoop, surrounds the outer walls of the church, and the upper windows, which are circular, are shaded by wide overhanging eaves and verges. The construction shows itself clearly both on the exterior and in the interior of the church, and consists of brick piers and arches

with intervening plastered or rendered spaces; the king-post roof is covered with tiles, and the verandah and cloister are of the plainest post and pent order. This is one of the most interesting exhibits; the simplicity in design arises from necessity, not from affectation, and is a good object-lesson to all who study this part of the Royal Academy exhibition.

The work of Mr. Temple Moore is represented in two drawings. No. 1592 is an interior of a new church at Bradford, which, although hardly pleasing in the windows of the end wall, is thoughtful and restrained. The south-west view of "St. Margaret's Church, Leeds" (1596), shows a very large square tower, having five stages, in overpowering relation to the body of the fabric. What appears to be the incumbent's house (there is no plan) is a nicely-designed dwelling built against the two-storied south porch of the church. The dwarfed effect of the house is to be regretted; we also are inclined to anticipate, amongst other disadvantages from such proximity, that the chimneys will smoke. In general respects, however, the design is a valuable addition to the architecture of this enterprising city.

One of the most attractive drawings in the room is No. 1593, a view of the Church for Christian Scientists, Manchester. Mr. Edgar Wood, whose work we are pleased to find has not escaped recognition, has produced a picturesque composition with an originality and absence of tradition befitting the comparatively recent growth of this new sect. The church proper, which has a very high pitched roof, is flanked by low wings, set obliquely to the front. The small diagram in the corner of the drawing suggests a very interesting plan, but the nature of the respective parts is not clear. The church has arcades forming passage aisles, and the wings appear to contain meeting and school rooms. Three large chimneys occupy a prominent position in the scheme, the boldness of which is cleverly masked by the introduction of the tall stems of trees. It is to be inferred from the draughtsmanship that the low buildings will be faced in brick and the roofs covered with tiles, giving contrast with the rough cast gable of the church, which contains a window arranged in the form of a cross and a canopy with figure in the apex. The character of the detail leans more toward a domestic than an ecclesiastical type. Mr. Wood also exhibits "Middleton Wesleyan Church and Schools," No. 1595, an excellent group of buildings arranged round a courtyard, within which is a small sunk garden. The plan adds to the interest of a study of the scheme; we are curious, however, to know the purposes for which most of the tiny class-rooms are to be used. The design has a late Gothic influence, although the detail is quite original in its application and the whole scheme refined. "The Church of St. Christopher, Haslemere" (1608), by Mr. Charles Spooner, is a small fabric in which a good village feeling is maintained. It is in acute contrast with the "West Front of a new church at Peckham" (1617), designed by Mr. Burke Downing, which is a heavy Renaissance elevation overburdened with "features." Messrs. Runtz and Ford contribute a view of the "St. Giles' Christian Mission Church, Great Wild Street" (1626), a distinctly good street church built in brick; there is no plan, however, to enable us to speak as to its other qualities.

In "St. John's Church, Palmer's Green" (1634), shown by a view of the east end, Mr. J. Oldrid Scott is responsible for an important work in which a large tower above the crossing is dominant. Too great a variety of materials, however, is used, and they are themselves put into a multitude of forms and patterns producing confusion. The two circular turrets with spirelets at the east end, and the staircase turret rising up the centre of the south transept are unsatisfactory. The clock dial is too small, the tower buttresses too slight to perform a work of support, either in reality or effect, and the whole design would gain dignity by a simpler and broader handling. The "Presbyterian Church, Frognaal" (1648) is, in this last respect, a great improvement. Messrs. Pite and Balfour have produced a good stone-built church with a nicely-designed tower.

We could hope for a larger representation of the works of Scottish architects than is usually the case; the few examples submitted in the present exhibition are not of any great interest. A set of scale drawings is given of the "New Organ and Chancel for the King's Welsh-House Church, Grosvenor-square" (1582), the author

of which is Mr. J. J. Burnet, A.R.S.A. The organ is divided so that each half terminates one of the side galleries. There are minimal advantages and disadvantages in this arrangement, but the fact of a gallery, which is substantially a structural object, ending abruptly in an organ case, which is a fitment, is a very weak point in this rearrangement. The octagonal parts of the cases into which many pipes are contrived are extremely heavy features. The marble paving, the choir stalls, pulpit, and other fittings are very good. A scheme of colour decoration, by Mr. R. Anning Bell, is incorporated in the design, including a large tapestry panel representing The Last Supper, some painted wall enrichments, and three stained glass windows. "New Building, Marischal College, Aberdeen" (1602), looks a very important work in the small drawing. Messrs. A. M. Mackenzie and Son, the architects, do not append a plan, which alone makes such a sketch intelligible; but we observe that a delicate treatment is resorted to where we should have anticipated an element of sturdiness and solidity which always characterised Scottish mediæval building.

Quite a large number of designs for church fittings and furniture are to be seen in the exhibition. Mr. F. L. Pearson sends "Reredos, All Saints' Church, Maidstone" (1446), a heavily-canopied and figured design in which the low side wings are not quite satisfactory. Mr. J. H. Eastwood has two altars, one for the Cathedral of St. Anne, Leeds (1520) and the other for the Cathedral of St. Barnabas, Nottingham (1611). These are both charming pieces of canopied work, well arranged for their relative positions. The altars, tabernacles, and retables are executed in marbles delicately insaid and suitably designed for the particular materials.

The same author submits drawings of the "Shrine for the Relics of St. Urban" (1648), which is full of excellent detail. All three exhibits are beautifully drawn by Mr. S. K. Greenslade. Nos. 1592 and 1597 are interior views of old churches having new furniture. The former is a screen at Dymock Church, Gloucester, and the latter consists of a new lectern and reredos at Abbey Dore Church, Herefordshire, in neither of which is any great originality displayed; but we have every belief that the author, Mr. R. W. Paul, has considered what is fittest for the positions. "New Organ, etc., Congregational Church, Leeds" (1618), is an excellent design by Mr. F. W. Bedford. A plan would have been useful, but it is seen that good effects are obtained from a large recess on the floor level and from an overhanging loft. No. 1650 is one of the anomalies of this year's selection. The pencil sketch illustrates the performance of a ceremony. The catalogue, however, directs observation to the design of the altar screen for the "Church of St. Catharine," by Mr. J. E. D. Spain. There is remarkable poverty in the design, wherein a hideous distortion of a classic order is the only element to be considered.

Of the designs for schools, "St. Helen's School, Abingdon" (1442), by Mr. F. Pearson, is perhaps the most important. This is a group of brick and stone-dressed buildings of some interest, but quite unintelligible as a composition owing to the absence of a plan. In the "Hull School of Art" (1481), a competitive design by Mr. H. R. Gardner, we have a successful attempt at making full use of an opportunity for securing breadth, which a building of this class presents. Mr. Edwin Gunn is also happy in this respect in his "Design for a Parish Institute" (1503), which is a vigorous piece of design, likely to favourably impress the minds of its habitués. No. 1559 is a view of some important additions to Radley College, by Mr. A. H. Ryan Temson. Mr. H. O. Crosswell sends "Hall and Class-rooms, Commercial Travellers' Schools, Pinner" (1502), and "Schools, Spring Grove, Isleworth" (1614), both of which are somewhat ordinary in design, and not calculated to make lasting impressions upon the scholars. In the "Pickering Grammar School" (1653), by Mr. John Bilson, a low, quiet design is obtained. The plan shows that the building is well adapted to the limited needs of a small population. No. 1615 is a view of the "Higher Grade School, Hackney," by the official architect, Mr. T. J. Bailey. This is a somewhat important addition to the London public school buildings, but in the matter of external design it is no advance upon previous examples in a collection of buildings which is, in some respects, unique.

Several groups of almshouses are hung on the

walls, but only one, No. 1569, by Mr. Septimus Warwick, has much merit.

"Ingram House, Stockwell" (1531), by Mr. A. T. Bolton, is a building intended to house bachelor clerks and other business men. The planning, although not here exhibited, is exceedingly skilful. The basis of the external design is the introduction of a large Doric pilastered order upon a rusticated base, built in brick; a deep frieze an important part in the scheme. We are inclined to doubt the expediency of the employment of a classic order for sheer elaboration in a modern institution of this kind.

TRAFALGAR-SQUARE; WEST STRAND (NORTH SIDE) AND AROUND ST. MARTIN'S CHURCH; LEICESTER-SQUARE; AND LOCAL IMPROVEMENTS IN ST. MARTIN-IN-THE-FIELDS, ST. ANNE, SOHO, AND ST. GILES-IN-THE-FIELDS PARISHES; 1851-1900.

(Continued from p. 15.)

Coventry and Cranbourne Streets.—In 1844 Coventry-street was extended from Princes, now Wardour, street across the site of houses on that side of Leicester-square, and in the winter of 1843-4 was pulled down the south side of a footway from the square to Castle-street for a road 32 ft. wide extended to St. Martin's-lane and Long-acre (Fig. 4, revised plan of June, 1840). The improvement, effected in 1844-5, yielded nearly 79,000, to Lord Salisbury for his interest in the Cranbourne-street area. On the site of the original Ryder's-court, a quaint corner of old Soho, is Daly's Theatre [November 14, 1891, with section and plan], by the late Spencer Chadwick, C. J. Phipps (obit 1897) being consulting architect; the main front is of Ham Hill stone; the house, opened on June 27, 1893, has been enlarged at the rear by Mr. P. E. Pilditch. Cranbourne-mausoleum, on the sites of Earl's-court and Cranbourne-passage, and the Hippodrome and Crown hotel, 1899-1900, are by Mr. Frank Matcham.

Shaftesbury-avenue.—In "London and Westminster Improved," 1766, Gwynn points out the convenience of a direct street from the Haymarket northwards through Soho and St. Giles-in-the-Fields. Under their Act of 1877 (40-1 Vict. c. 225) the Board of Works began the thoroughfare in the winter of 1884-5, by levelling the block between Piccadilly, Tisbury-street, and Regent-circus (Fig. 5). With the south side of Richmond-street they demolished No. 53, Wardour-street—formerly No. 38, Princess-street—the last remaining home in London of Nell Gwynne.* Entering St. Giles parish at Five Dials (Moor-street), the Board pulled down the southern side and most of the northern side of Dudley (until June 9, 1845, Monmouth) street, and crossing Broad-street, laid out two openings into New Oxford-street. For the western opening they incorporated nearly all the south portion, formerly Plum Tree-court, of Bloomsbury, formerly Charlotte, street (Fig. 3), leaving only the two chapels, the Westminster French Protestant Girls' School (1847), and the French Protestant Episcopal Church of St. John the Evangelist, established by Charles II. in Savoy Palace in 1661, and, as the carved inscription testifies, rebuilt in 1845 by descendants of the refugees; the architect was Ambrose Poynter (obit 1886); R. L. Roumieu (obit 1877) repaired and improved the edifice in 1869. Bloomsbury Baptist Chapel [April 13, 1848], built for Sir Morton Peto by John Gibson (obit 1892), after the Lombardic manner, has outer walls of white brick with Caen stone dressings and two spires 117 ft. high. Bedford Proprietary Chapel, erected by Samuel Mecke in 1770, and reconstructed in 1846, was pulled down in the spring of 1896; Oxford-mansion, by Mr. G. D. Martin, occupies the site. For the eastern opening were demolished Thorney-street and part of Vine-street (Fig. 3). The new road, constructed by Turner and Son, T. Turner, and J. J. Griffiths, at a gross cost of 1,136,450*l.*, and a net cost of 758,887*l.*, was opened in January, 1886, three months after the death of Lord Shaftesbury, much of whose philanthropical labours were expended on behalf of the poor in St. Giles. It has a subway along its course of 1,170 yds., and has a minimum width of 60 ft. During the progress of the works for Shaftesbury-avenue

* In the interval 1667-70: in 1667 she lodged in Drury-lane; in 1670 she took a house on the north side of Pall Mall.

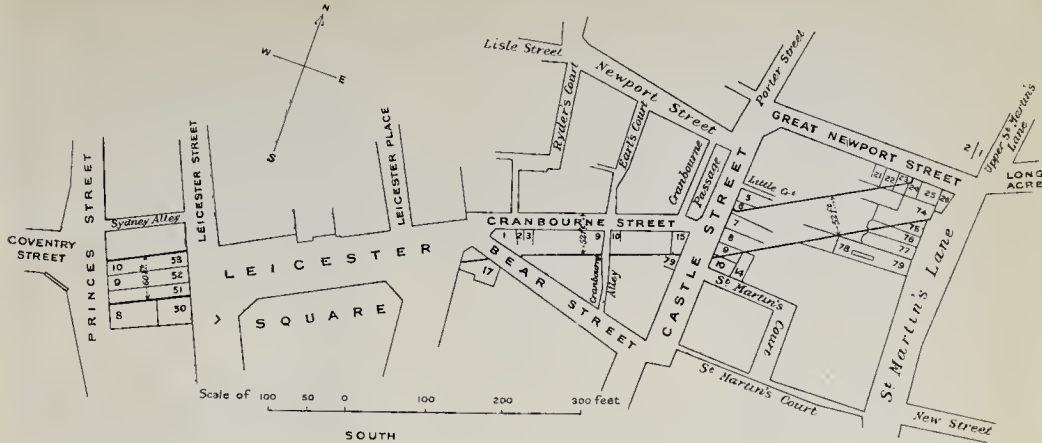


Fig. 4. From Chawner and Pennethorne's Plan for "New Street from Coventry-street to Long-acre" (1840).

and Charing Cross-road, 3,044 persons were dispossessed; in neither instance did the Board take initial steps to ensure that the new façades should present in some measure a continuity or harmony of design. No. 172, the French Hospital and Dispensary, providing for sixty beds, and built in 1888-90 after plans and designs by T. Verity, as honorary architect, supplants the house in Leicester-place, Leicester-square, where the charity was established in 1861. The Shaftesbury Theatre, having eighteen doorways on its four open sides, was built in 1888 by C. J. Phipps, for the late Mr. John Lancaster, whom, on the opening night of October 20, 1888, the audience greeted with "Best pit in London!" The Lyric, erected for Mr. Henry J. Leslie by Messrs. Stephens and Bastow, who tendered for 26,777*l.*, is also by Phipps, and accommodates nearly 1,600 persons. The façade, 148 ft. in length, of red brick and Portland stone, is after the Renaissance style; the upper floors, having a separate staircase, were arranged as residential flats, and the building covers an area of some 14,200 ft. superficial. The buildings absorbed the rear portion of the Café de l'Etoile in Great Windmill-street, where William Hunter formed his anatomical museum; his nephew, Dr. Matthew Baillie, succeeded him in that house, and then James Wilson, another celebrated anatomist; the portico and steps are removed and a window fills the doorway. The Trocadero, built for a music-hall but converted into a restaurant in 1896, displaced the Argyll dancing-rooms, closed on November 30, 1875, and originally the tennis-court of Piccadilly Hall. The tennis-court had been the home of Duburg's wax-work exhibition; it became, in turn, a theatre, and Laurent's casino. Messrs. J. Lyons and Co. acted as "their own general contractors," Messrs. H. Young and Co. supplying the steel and iron work. The structure has nine floors, and a façade of Dumfries stone, with marble work. The plans, and "modern" French Renaissance designs, were made by Mr. J. Hatchard Smith, assisted by Mr. W. J. Ancell; the former carried out the work until May, 1896, when the latter completed it in October, 1896. Scott's Restaurant, by Messrs. Treadwell and Martin, 1893-4, at the corner of Coventry-street, occupies the site of Piccadilly Hall; between the two stands St. Peter's Church in Great Windmill-street, by R. Brandon, 1860-1. Nos. 128-32, London Salvage Corps (1887), is by W. Wimble (*obit* 1903); E. P. Loftus Brook (*obit* 1895) designed No. 164, the National Refuges for Children; No. 231, Ashley Hall [April 19, 1890], is by Charles Bell (*obit* 1899). At Cambridge-circus is the building renamed the Palace of Varieties in December, 1892, which the late Mr. D'Oyley Carte erected in 1888-9 as the Royal English Opera House. He was "his own builder," employing no general contractor. Mr. T. E. Collcutt designed the very striking and, for a London theatre, picturesque façades [January 3, 1891], as well as all the interior decoration. The constructive work was planned and superintended by Mr. G. H. Holloway, who directed the whole of the works. For the interior decoration, executed by Collinson and

Lock, beautifully-coloured Italian and Algerian marbles, Mexican onyx, and Derbyshire alabaster were lavishly used.

Charing Cross-road.—When a Commissioner for Reforming the Buildings, etc., Evelyn proposed to make a road through the Cock-and-Pye fields—built over as Seven Dials by Neale in 1694—and to open out St. Martin's-lane along the side of Covent Garden. In 1826 the Woods and Forests revived the project; in 1846-8 all the east side of Upper St. Martin's-lane, and some houses northwards, were demolished for a contemplated wider road from King-street, Covent Garden, through St. Giles and Soho, to the east end of Oxford-street. The Board of Works accomplished a part of that scheme by laying out Garrick-street, constructed by E. Thirk, at a net outlay of 34,140*l.*; the street, 405 ft. long and 50 ft. wide, was completed in March, 1861. But under their Act of 1877 the Board altered the plans by shifting the line of route to Castle-street, a short distance to the west of St. Martin's-lane and Seven Dials. Delayed by reason of the obligation to supply house-room for the evicted working-classes, they did not begin active operations until the summer of 1885, when they pulled down part of the east side of Crown-street, Soho, at the north end. Continuing southwards along Crown-street (Fig. 5) they absorbed Grafton-street, Newport Market (see *infra*), Princes-court, and, in Little Newport-street, Grafton House and an adjoining mansion on the site of the residence of Mountjoy Blount, whom Charles I. elevated Earl of Newport. Grafton House formed a fashionable resort and lounge when Soho was an aristocratic quarter of the town. The road, which cost 583,084*l.* net, and was opened on February 26, 1887, is 966 yards long with a width of 60 ft., increasing to 130 ft. at the south end; the subway, 12 ft. by 7 ft. 9 in., has its arch rounded in brick. For a cause already mentioned the elevations along the frontages present more variety than excellence, and but few call for particular notice. In August, 1888, the trustees of the settled estates of the late Marquis of Salisbury, tenant for life, sold Nos. 113-4-5, St. Martin's-lane as the site in part of a Parish Hall in lieu of that on the north side of the church (Fig. 2). Robert Walker (*obit* 1896), designed the St. Martin's Free Library for the Library Commissioners on the east portion of that site (1890). He was architect also of the Town Hall, erected by Messrs. Mowlem and Co., for 23,206*l.*, and opened on July 16, 1891. Mr. J. Murray altered and enlarged the latter as the Westminster City Hall in 1901-2, on Messrs. Patman and Fotheringham's tender for 24,593*l.* The Garrick Theatre [June 30, 1888], by Mr. W. Emden, had the then unusual advantage of situation affording side-passages for the since organised queues, without obstruction of passing traffic. A subway under one passage connects the detached dressing-rooms and the stage, which is in the south part of the building; the auditorium is sunk half-way below the street level, and the tiers were hung without columns or other visible support. The entire designs are after the Italian Renaissance; Messrs. Peto Brothers were the contractors.

Sir Charles Wyndham's Theatre, by Mr. W. G. R. Sprague, 1898-9, is similarly isolated on three sides by the widened St. Martin's-court; the plans provided for an audience of nearly 1,200, and a roof-garden. No. 28, Camera Club, and the block on the site of the old Clock House, at the opening into Cecil-court, as re-built, are by Mr. F. T. Pilkington, 1892; just opposite at the corner of Bear-street is No. 39, built as Newbery House, after Mr. Carritt's designs in 1889, for Messrs. Griffith, Farran, Okeden, and Welsh, successors of John Newbery, "the philanthropic publisher" of St. Paul's church-yard. Messrs. Crosse and Blackwell's stables, etc. [April 15, 1876], on the site of the old Plough Inn, are by R. L. Roumieu, who made the drawings for the raising and extension of their other premises, carried out by Messrs. Roumieu and Aitchison. The Welsh Presbyterian Church, on the west side, formerly in Nassau-street, Soho, is by Mr. James Cullitt, "Les Grecques," the first Greek church established in England, and built by Joseph Georgeirenes, ex-archbishop of Samos, in 1677, in Hog-lane, since Crown-street, in the then parish of St. Martin, belonged to the French Huguenots from 1682 until its sale in 1822, by the trustees to some Calvinistic Nonconformists. In 1849 the rector of St. Anne, Soho, averted its conversion into a dancing-saloon, and P. C. Hardwick (*obit* 1892) re-arranged the interior. On June 29, 1850, the church was dedicated to St. Mary the Virgin. At that time it was surrounded by twenty-two almshouses in four blocks, whereof those in Chapel-place, to the south and west, have been ascribed to Nell Gwynne; we know not on what authority, nor is her name cited in the inscriptions with founders' names, 1680-6, given by Hatton in his "New View of London," 1708. In 1869 a clergy-house and vicarage were built on the north side of the church; in 1872-4 were added a chancel, vestries, and a north aisle [October 2, 1875, with plan], and schools for 600 children, on the site of the east and north almshouses and the former clergy and church houses, from designs by R. Herbert Carpenter and W. Slater, the former (*obit* 1893) being architect of the chancel, west end, and north aisle. The sextapartite and domical groining, in red brick and stone ribs, of the chancel, which rises 60 ft. to the crown of the vault, is supported by massive buttresses having thin walls between them. The south and west walls having been condemned, a final service was held on Sunday, August 7, 1898, in the church which is depicted—but as reversed—in Hogarth's "Noon." The vaults were cleared, the floor was underlaid with concrete; the foundation stone of the new nave was laid on June 11, 1890, Mr. A. R. G. Fenning being the architect. In the autumn of that year the south and west almshouses were pulled down, a Board cookery and laundry centre, by Mr. T. J. Bailey, replacing the south group (see illustration) in 1892.

Newport Market and the Refuge.—The area of the market (Fig. 5), about 40,000 sq. ft., was cleared in July, 1882, having been reserved by Clause 33 of the Board's above cited Act of 1877, for working-class dwellings, erected as Sandringham-buildings by the Improved

Industrial Dwellings Company, on the east side of Charing Cross-road, in 1884-5. The buildings (see illustrations) included the market-house, an octagonal structure having a glazed upper story, and one of the last of the slaughter-houses which, with that in Bear-yard, Clare Market, had survived the Public Health Act of 1849. To the south of the market-house stood an old barn-like structure, which, erroneously described as the slaughter-house, had been in fact the place wherein the beasts were stabled, the dealers meeting in the "chaffering floor" above the stalls. That building, whereof the large-framed timber work and the stalls yet remained, became in 1863, by the care of the late Mrs. W. E. Gladstone, in association with the House of Charity in Greek-street, a refuge for the homeless poor, combined with

an Industrial School. The efforts made by Mrs. Gladstone and her co-adjutors were one cause of the introduction of the Houseless Poor Act, which required the London Boards of Guardians to provide more accommodation for casuals at the charges of a common fund.

SOME NOTABILIA.

Metropolitan Board of Works established under 18-9 Vict. c. 120 (1855); abolished by Local Government Act, 51-2 Vict. c. 41 (1888).
 St. Martin; St. Anne, Soho (1778); St. James, Westminster (1855), and other parishes included in the City of Westminster by London Government Act, 1899, and royal charter of October 29, 1900; the vestries abolished. City Hall, on site of Swan Close, and parish pound.
The Mews.—Aggas's map (January 17, 1903). Nelson column, 1840-9, W. Railton (May 28,

1898, sections); the lions unveiled January 31, 1867—Sir Edwin Landseer. Gordon statue [December 1, 1888]—H. Thornycroft, pedestal—A. Waterhouse.
 St. Martin's.—Mr. Boore gives, 1885, a bust of J. Gibbs, by Rysbrach, 1726, to the parish. F. Buckland finds John Hunter's coffin in the vaults; interment in Westminster Abbey, 1859. Electrical lamp standards—Singer and Sons, 1900.

Leicester-square.—Leicester House; Waller's "Sacharissa," the patriot Algernon Sidney, and Henry the beau Sidney of the De Gramont Memoirs. Long's-court; J. Gibbs built a house c. 1730, for Sir Phillip Parker Long. Green-street; 11, Woollett, engraver; (old) Soc. of Beefsteaks, 1735-1869. "Cranbourne-street," v. Gamble's rare shop-bill engraved by Hogarth, 35, St. Martin's-street, Sir Isaac Newton (1710-27), and the Burneys. Mrs. Threl's "dear



Fig. 5. Plan based on the Ordnance Map of 1870-3, to show the Widening of Coventry-street, the Alteration of Regent-circus, and the Laying-out of Shaftesbury-avenue over the Old Street Lines.

Newtonians"; front altered, 1849, and the so-called "observatory" removed; but Newton did very little astronomical work, by way of observation, in London.

St. Martin's-lane.—Cecil-court, rebuilt 1889-90, first London building, April, 1764, of L. Mozart and his two children. 75. Old Slaughter's (1892), pulled down for Cranbourne-street. Young, of New, Slaughter's, 82, County Court. Duke of York's Theatre, by W. Emden, 1891-2, on site of 104, Sir J. Reynolds, and of a house at the rear in Peter's-court, Sir J. Thornhill. 60 (rebuilt), and in 1803 opposite the church, T. Chippendale. 100 (Burlingame-mansions), Fuseli. New Theatre—W. G. R. Sprague, 1900-1. Aldridge's Mart, 1753, enlarged—P. E. Filditch. County Court replaces the Court of Requests in an old Baptist Chapel at the rear, in Castle-street (Fig. 1). Confer Smith's "Nollekens and His Times," 1828, for famous residents, and for Rubilliac's studio, rebuilt as the Meeting House in Peter's-court.

Soho.—St. Anne's church, the Danish tower rebuilt with vestry rooms and watch and engine houses, 1802-3, by S. P. Cockerell; restoration by Sir A. Blomfield; graveyard opened 1892, new W. wall for widening of Vardour-street, 1900.

Dean-street.—Soho, since Royalty, Theatre, 1834—S. Beazley; rebuilt 1882-3.

Frith-street.—87, the Novellos, 1829-34; Alf. Novello to Dean-street, 1834. Apollo Theatre, Shaftesbury-avenue, 1900-1—Lewin Sharp.

Gerard-street.—34-5, Macclesfield House: Charles Gerard, Earl of Macclesfield, 1680-93; his son; we find in the rate-book, 1700, "Earle Maxfield" is rated 11. 6s. for that house; Lord Mohun, died after the duel with the Duke of Hamilton, November 15, 1712; Lord Lyttelton; burned August 10, 1887, rebuilt for the Pelican Club—Martin and Purchase, 43 (rebuilt), Dryden, 1686-1700; we find he was rated at 11s. 3d., and his widow, "Madam Dryden," at 12s. **Soho-square.**—Carlisle House, Mrs. Cornelly's assembly rooms pulled down, 1804, the saloon converted for St. Patrick's R.C. Church, rebuilt 1891-2—Kelly and Bireball. French Protestant Church of London [June 27, 1891, and June 10, 1893] and schools in Noel-street [May 15, 1897]—Aston Webb. No. 16 [October 31, 1896]—J. T. Wimperis and Arber. Charles II.'s statue, with fountains, removed to Graeme's Dyke, Harrow Weald, July, 1886. Soho bazaar, 1815-1900.

Greek-street.—31, Jonathan Buttall, Gainsborough's "Blue Boy," succeeded to his father's ironmongery business. I. Alderman Beckford; Metropolitan Commissioners of Sewers, 1847-56; Metropolitan Board of Works until 1861, when bought for the House of Charity, the chapel—Jos. Clarke, windows—O'Connor. Five Dials; the French Change, Moor-street, site of entrance to the Swiss Chapel.

St. Giles. For the Irish and other populace, cookeries, ragged schools, etc., v. "Rookeries of London," 1850, a report of 1848, and John Leech's "Children of the Mobility." The churchyard, opened July 8, 1891; Lord Derwent-water's remains removed to Thorndon, Essex; W. Leverton's "resurrection" gate, of bricks, replaced with one of stone, 1804, shifted from N. to W. side, 1865. Public Library, High Holborn, 1893-4—W. Rusworth. Seven Dials column, having six faces, to Weybridge-green, 1822. Charing Cross-road, Shaftesbury-avenue, and High-street follow the line of the wall of St. Giles Hospital, the orchard to N.E. of Cambridge-circus.

Streets re-named; Betterton (vice Brownlow); Goldsmith (Coal-yard); Macklin (Charles, formerly Lewknor's-lane); Sbelton (King); Dyott (George, but formerly Dyott); Coptic (Duke); Soho (Charles); Ganton (Cross); Whitcomb (lower end was Dorset-place until 1882, upper end was Princess-street until 1881). Museum-street absorbed Queen, Peter, and Bow streets, Bloomsbury.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary meetings of the Architectural Association will in future, as in the past, be held on Fridays. The Committee have taken pains to consult the views of the whole body of members by voting papers, and are satisfied that, though Friday may be inconvenient to some, there is not sufficient evidence that departure from long tradition is generally desired. It is, however, decided to hold the meetings in the new premises, in which there is ample accommodation, and in the July issue of the *Notes* the hope is expressed—a hope in which we share—that the enthusiasm of the past will not only be maintained, but enhanced, and that the admirable and varied series of papers and discussions promised for next session will secure the attendance and participation both of junior and senior members.

The following is the prize-list for session 1903-1904:—

A.A. Travelling Studentship, value 25/.,

and silver medal, George Drysdale; second prize, value 5/., Alick Horsnell; A.A. Medal, value 10/., J. A. Hallam; A.A. Essay Prize, value 10/., 10s., and silver medal, not awarded; Banister Fletcher Bursary, value 26/., 5s., and medal, F. J. Watson Hart; Architectural Union Company's Prize, value 10/., C. R. Pinsent. School of Design.—Elementary Class—1. D. G. Round, prize value 3/., 3s. and bronze medal; 2. C. K. Roe, certificate. Advanced Class—1. Maurice E. Webb, prize value 5/., 5s., bronze medal, and pass for modelling class; 2. Alick Horsnell, certificate and pass for modelling class.

The Andrew Oliver and Class Prizes will be announced next month.

Mr. Leonard Stokes has given a donation to the New Premises Fund of 100/., and the total amount of the fund is now 6,266/., 8s. 4d.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, S.W., Mr. J. Williams Benn, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Bermondsey Borough Council 31,000/., for electric lighting and dust destructor purposes; Bethnal Green Borough Council 8,400/., for paving works; Shoreditch Borough Council 7,000/., for electric light installation, and Metropolitan Asylum District Managers 126,280/., for various purposes.

Park Side Widening.—Mr. Greenwood presented a petition, signed by the Duke of Westminster, Earl Cadogan, Lord Howard de Walden, and about 300 of the principal residents in Belgravia and Knightsbridge, praying the Council to consider the desirability of acquiring the leases of the houses known as Park Side, Knightsbridge, which are about to fall in, with a view to the widening of the road.

The petition was referred to the Improvements Committee.

Rejected War Trophies.—On the recommendation of the General Purposes Committee that the Council was not prepared to select a site for the two guns allotted to London as war trophies,

Captain Swinton moved, as an amendment, that the report be received with the exception of this paragraph, which he regarded as a slur on the whole British Army.

Mr. Sidney Low seconded the amendment, which, after a short discussion, was rejected on a division by 72 votes to 32.

Goldsmiths' Institute.—Sir William Collins (Chairman of the Education Committee) stated that, as a result of interviews with the Clerk of the Goldsmiths' Company and the London University authorities, it was made clear that the company had no intention of maintaining the institute at New-cross in perpetuity. He was, however, able to read a letter from the company to the effect that as it was too late for the company to include the whole cost of maintaining the classes during the coming winter in this year's budget, the company would grant an additional 5,000/., to be spent in consultation with the Council. If the Council saw fit to accept that offer the classes would be continued in the coming session as in the past. That was in addition to the 5,000/., a year which the company had undertaken to provide for three years.

Mr. Piggott thought the offer of the company was anything but generous.

The Council then approved of the continuation of the institute in its present form for at least one year.

Vauxhall Bridge.—The Bridges Committee, reporting upon the progress of the construction of Vauxhall Bridge, stated that under the terms of the contract the bridge should be completed by December 31, 1905. One quarter of the contract time had elapsed and about 5 1/2 per cent. of the work on the site of the bridge had been completed. In addition, about 720 tons of steel for manufacture, out of a total of 3,720 tons, had been delivered at the contractor's yard at Grays. Although the amount of work executed was not large, the contractor (Mr. C. Wall) had assured the committee that he was taking such steps as were necessary to complete the work by the time specified in the contract.

Erection of a Sign at No. 86a, Brick-lane, Spitalfields.—The Building Act Committee reported as follows:—"Our attention having been drawn to the erection of a sign at No.

86a, Brick-lane, Spitalfields, without the consent of the Council having been first obtained, we gave instructions for proceedings to be taken to obtain its removal. The summonses taken out on behalf of the Council were dismissed by the magistrate who refused to state a case for the opinion of the High Court. The principle involved is of considerable importance, having regard to the fact that the Divisional Court of the High Court recently expressed some doubt whether the case of *Hull v. the London County Council*, which decided that such signs were not projections within the meaning of section 73 of the London Building Act, 1894, was rightly decided, and we therefore think that application should be made for a mandamus to the magistrate to state a case for the opinion of the High Court in the matter of the Council *v. Mr. Schewzik re the erection of a projecting illuminated sign at No. 86a, Brick-lane, Spitalfields*, and that, in the event of the application being successful, all necessary steps be taken to obtain the opinion of the High Court upon the case."

The recommendation was agreed to.

Restaurant Shelters.—On a recommendation of the Building Act Committee to authorise Messrs. Lyons and Co. to erect an iron and glass shelter to a restaurant building on the South side of Piccadilly, a discussion on the general question of allowing such shelters took place.

Mr. J. Burns, M.P., while admitting that there was something to be said for allowing a shelter for theatres, strongly protested against the growing tendency to allow these shelters to restaurants. If this continued the streets of London would be spoiled.

The Council rejected the recommendation.

Waterloo Bridge Lamps.—Mr. Burns, M.P., asked the Chairman of the Bridges Committee whether, in the event of there being further alterations in the lighting of their bridges or other structures, care would be taken that the officers did not push interesting artistic fittings into the background, as was the case with the lamps on Waterloo Bridge.

Mr. Strauss said that, as in the past, the Council would be responsible for the doing away of lamps. A full report on the Waterloo Bridge lamps would be made on the reference of Sir Wm. Richmond, passed last week. The old Council was responsible for the taking away of the old lamps and for the new design, which he admitted was not an artistic design.

Foundations for Engines, Greenwich Generating Station.—The following recommendation of the Highways Committee was agreed to:—"(a) That expenditure on capital account, of sums not exceeding 9,900/., in all be sanctioned, in connexion with the construction of the foundations for the engines and dynamos for the first portion of the electricity generating station now being established by the Council at Greenwich for the electrical working of portions of its tramways. (b) That the offer of Messrs. H. Lovatt, Limited, to execute, at the schedule rates under their existing contract with the Council for the erection of the superstructure of the first portion of the Greenwich generating station, the construction of the foundations for the engines and dynamos for that portion of the generating station referred to in the foregoing resolution, be accepted."

Labouring-class Accommodation Demolished and built during the year 1903.—The Housing of the Working Classes Committee submitted the following report:—"We present for the information of the Council a return which has been prepared under our instructions by the statistical officer showing the net addition to labouring-class accommodation provided in the County of London and in the adjacent districts in the year 1903. The return also shows the number of rooms and tenements contained in the houses as well as the average weekly rents charged per tenement and per room. The information relating to the county areas has been obtained in the first place from the provisional valuation lists of each parish and subsequently checked by local investigation. As regards the extra London districts, the town clerks of Croydon and West Ham, and the clerks of the 22 urban and three rural districts, all supplied statistics and gave every facility for obtaining the necessary information.

The several parishes and metropolitan boroughs in London and the parishes and urban districts outside have for the purposes of the return been grouped into five sections, but the figures are given separately for each unit. The sections

are—(a) Western section—From the river northwards to the Edgware-road and the adjacent districts in Middlesex. This district includes the City of Westminster. (b) Northern section—From the Edgware-road to the Kingsland-road and the adjacent districts in Middlesex. This district includes the City of London. (c) Eastern section—From the Kingsland-road southwards to the river and all the adjacent parishes in Essex. (d) South-Eastern section—From the river to the eastern boundary of the Metropolitan Borough of Lambeth and the adjacent parishes in Kent; and (e) South-Western section—From the eastern boundary of the Metropolitan Borough of Lambeth westwards to the river and the adjacent parishes in Surrey. Each section is sub-divided into three zones, which are shown on a map which accompanies the return. The central area comprises the City of London, the City of Westminster, the Metropolitan Boroughs of Holborn, Finsbury, Bethnal-green, St. Marylebone, Stepney, Bermondsey, and Southwark, and the northern part of Lambeth and southern part of St. Pancras. The rest of London comprises the remainder of the County of London; while extra London comprises the urban districts and parishes in the immediate neighbourhood of the County of London. Taking the three zones together, the number of rooms provided and demolished in the course of the year may be summarised as follows—

	Central area.	Rest of London.	Extra London.	Total area.
Number of rooms provided . . .	3,632	22,274	38,006	63,912
Number of rooms demolished . .	3,192	1,239	472	4,903
Net addition . .	440	21,035	37,534	59,009

It is not possible to say exactly to what extent the new labouring class accommodation has exceeded that required to meet the increase in the labouring class population. Taking into account, however, the last census figures as well as the number of persons occupying the Council's dwellings, we find that an average of 1½ persons per room is a reasonable figure to take for accommodation provided within the county area, and an average of 1½ persons per room in the extra London area. If this basis be adopted, it may be stated that accommodation for 79,130 persons has been added in the course of the year. If the population increased in the same ratio as in the decennial 1891-1901, the increase would be 94,920 persons of all classes, although it is believed that an estimate on this basis shows a larger increase than has actually taken place. On the assumption that the increase in the labouring class population amounted to two-thirds of the total, such increase would be 63,280 persons on the basis of the decennial period for the whole area, or 56,318 persons on the basis of the last quinquennial period for London and the decennial period for extra London, whereas accommodation for 79,130 persons has been provided. The Council adjourned at 7.30 o'clock.

ANDERSON'S DUODECIMAL SLIDE RULE.—This invention, patented in February, 1904, by Major Anderson, R.E., promises to overcome in some measure the limitations which hitherto have militated against the adoption of the slide rule by engineers and quantity surveyors. One of the most important of the limitations in question is that the slide rule is a purely decimal instrument, involving the use of conversion tables in countries where the metric system is not commonly employed. Another disadvantage is found in the impossibility of obtaining sufficiently accurate readings on a rule of reasonable length. A feature which is somewhat perplexing to the novice is that the values of the graduations are decimally variable, in the sense, for example, that the figure 2 may be read as 0.02, 0.02, 0.2, 2, 20, 200, and so forth. In Major Anderson's rule, the numbering is made absolute, rendering subdivision possible other than decimally; but instead of the scales repeating longitudinally, they repeat in a series of parallel lines, the number of which may be increased as far as the breadth of the rule will permit. It would be impossible to explain the construction of the instrument in a short paragraph such as the present, especially without a diagram; but those of our readers who are interested in the subject will be able to obtain particulars from Mr. Casella, of Holborn Bars, by whom the instrument is being manufactured.

Illustrations.

THE DOME, ST. PETER'S.

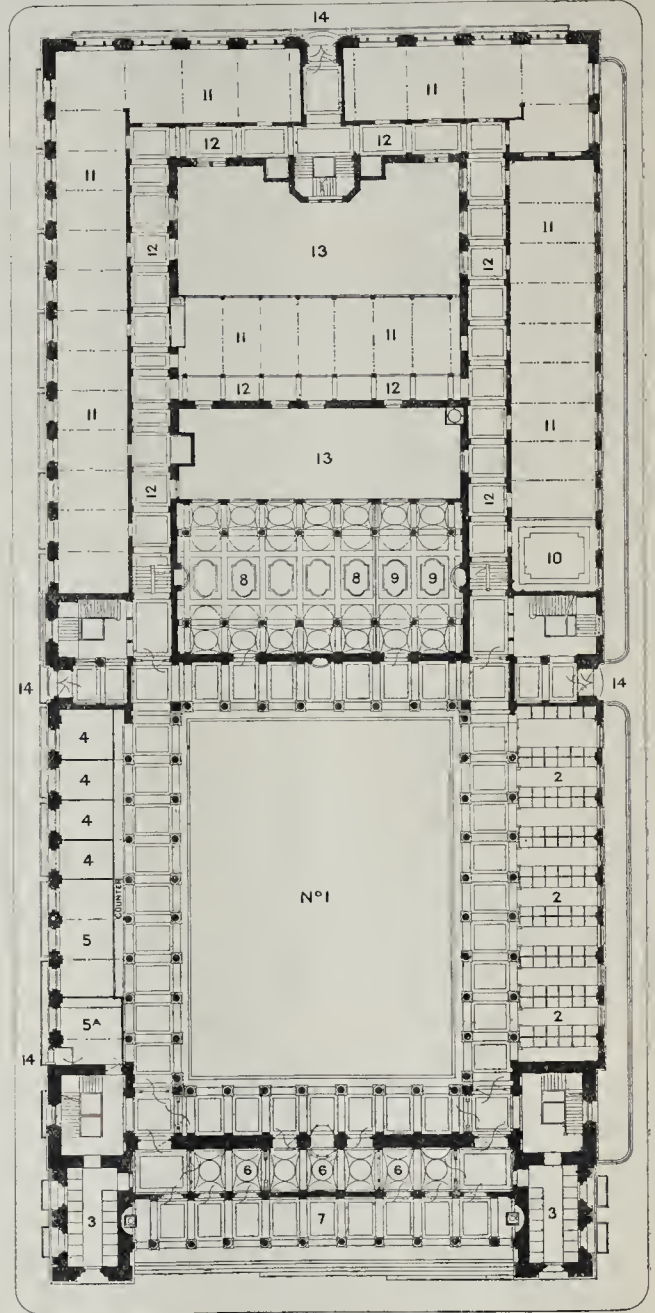


PHOTOGRAPHIC view of Michelangelo's great dome from a near and unusual point of view may not be without interest.

It gives an idea of the massiveness of construction of the dome and its substructure,

though hardly of its scale, for there is nothing in the foreground objects to furnish a definite scale. The coupled columns round the drum are about 42 ft. in height, and each of the swags in the frieze is 20 ft. long. The architecture of the drum, however, is better in respect of scale than that of the body of the church.

The drum alone, it will be remembered, was actually built under Michelangelo's inspection, though the dome and lantern were carried out from his design.



OLD HALL STREET

Liverpool Cotton Exchange. Ground Floor.

**TOMB OF POPE INNOCENT VIII.,
ST. PETER'S.**

The illustration shows the tomb of Pope Innocent VIII., which stands at the back of the second pier on the left side of the nave. It was executed, in 1492, by Pietro and Antonio Pollajuolo, the latter celebrated for his work in bronze relief.

On a projecting bracket is the seated figure of the Pope holding a spearhead, to recall the present made to him by Bajazet II., who sent him what purported to be the original spearhead with which Christ was pierced by the Roman soldier. The recumbent figure below is also that of the same Pope.

LIVERPOOL COTTON EXCHANGE.

We give this week the perspective view and plans of two of the floors of the selected design for the new Liverpool Cotton Exchange, by Messrs. Matar and Simon.

The design was described in our article on the competition designs last week. It is only necessary to add the references to the numbers figured on the plans.

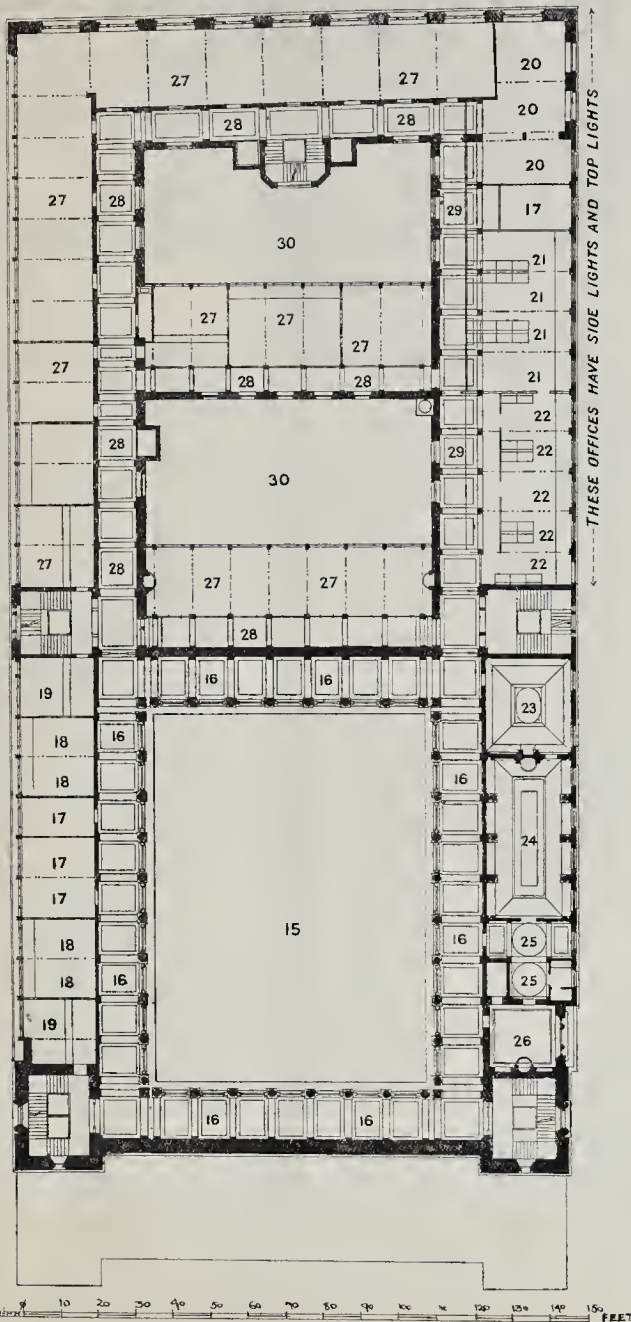
Ground Floor Plan.

1. The Exchange.
2. Telephones for Members.
3. Telephones for Public.
4. Cable Rooms.
5. Post and Telegraph Office.
- 5A. Post and Telegraph Office (Public).

6. Vestibule.
7. Porch.
8. Smoke Room.
9. Reading Room.
10. Committee Room.
11. Offices to Let.
12. Corridors.
13. Areas for Light.
14. Entrances.

First Floor Plan.

15. Upper Part of Exchange.
16. Upper Colonnade.
17. Private Offices.
18. Cotton Offices.
19. Clerks' Offices.
20. General Office.
21. Clearing Room.
22. Clearing House and Bank.
23. Committee Room.
24. Board Room.
25. Ante Room.
26. Secretary's Room.
27. Offices to Let.
28. Corridors.
29. Private Corridor.
30. Areas for Light.



Liverpool Cotton Exchange. First Floor.

MANCHESTER STOCK EXCHANGE.

This block of buildings is designed for a Stock Exchange and offices to let, the details of the arrangement being fully described in our issue of May 28 last, when a review was given of the various sets of drawings submitted in the competition, in which Messrs. Bradshaw and Gass, of Bolton, were successful, and their design is here illustrated.

The ancient lights which surround the site on all sides made it necessary to keep the new buildings within the height of the old ones, and the design had to be adjusted thereto. The main entrance to the Stock Exchange is on the street level in Norfolk-street, the "house" and its accessory offices being placed in the rear, with a secondary entrance from Pall Mall. The "run" of the business in the Manchester Stock Exchange was carefully studied and is fully provided for, so as to give the greatest convenience for the members. A large clear floor space is given to the house, which is domed and has side-lights, with the members' reading and smoke rooms near the members' entrance and overlooking the house. At the clerks' end and near their entrance the forty telephone boxes are placed, the quotation boards being in a central position. The clerks' rooms and clearing house are on the lower ground floor, with the secretary's rooms over the members' entrance, convenient for the board room, and accessible also from the office staircases. Offices to let are arranged along the Norfolk-street and Pall Mall fronts, with entrances from both streets. It is intended to erect the building in Portland stone and use marble lining in much of the interior.

**HOUSE AT WINTERSLOW, NEAR
SALISBURY.**

This house is situated on the Downs and commands a good view of the surrounding country.

The walls are of red brickwork, and the roof is tiled.

It is intended as an occasional residence by the owner, who resides in London; the village in which the house is situated being very rural and retired.

The builders are Messrs. Clarke and Son, of Winterslow; and the architects Mr. A. H. Hart and Mr. P. L. Waterhouse.

**Nos. 10 AND 11, PARK-PLACE,
ST. JAMES', S.W.**

The illustration shows two freehold houses to be erected on this site. It is intended to use Portland stone with red brickwork, and the ornament is strictly confined to positions where it will prove of most value.

Mr. A. H. Hart and Mr. P. L. Waterhouse are the architects.

CHURCH OF ST. SAVIOUR, FITZROY-SQUARE.—The Ecclesiastical Commissioners have approved of a scheme propounded by the Bishop of London, for the demolition of the Church of St. Saviour, in St. Pancras parish, and the union of the benefice with that of St. John the Evangelist Church in Charlotte-street, Fitzroy-square. The proceeds of the sale of the site and materials are to be devoted towards the endowment of a new church at Enfield. St. Saviour's Church was built as Fitzroy Chapel after, it appears, the designs of the brothers Adam, who laid out the square, of which the east and south sides were erected after their designs in 1793-5; the chapel, having been altered and improved, for 1,050 sittings, by J. Peacock, was consecrated on July 19, 1864. The organ, by Lincoln, was rebuilt by Walker.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Walworth.—Buildings upon the site of Nos. 347 to 351 (odd numbers) inclusive, Walworth-road, Walworth, to abut also upon Liverpool-street (Messrs. Cluttons for the Ecclesiastical Commissioners).—Consent.

Hampstead.—A motor-house at the rear of No. 156, Fordwych-road, to abut upon Rondurad, Hampstead (Messrs. Done, Hunter, and Co., for Mr. W. Jones).—Consent.

Strand.—The rebuilding of Nos. 1 and 1a, Cockspur-street, and Nos. 18 and 19, Pall-mall East, Strand, with porches and projections (Mr. H. Tanner, jun., for the International Navigation Company, Ltd.).—Consent.

Hackney North.—Buildings on the west side of Wordsworth-road, Stoke Newington, southward of the Baptist chapel (Mr. C. M. Cobb for Mr. A. J. Weibking).—Consent.

Lewisham.—Buildings with one-story shops upon a site abutting upon the south side of Ewhurst-road and west side of Salehurst-road, Lewisham (Mr. H. L. Upham for Mr. H. Lillywhite).—Consent.

Islington, North.—Retention of a showcase on the forecourt of 147, Seven Sisters-road, Islington (Mr. H. Hoek).—Consent.

Wandsworth.—Additions to the Union Church, Upper Richmond-road, Putney (Mr. C. De Gruchy for Messrs. C. W. Jones and H. Rofey).—Consent.

Battersea.—An addition to the Southlands Training College, High-street, Battersea (Messrs. C. Bell, Withers, and Meredith for the Wesleyan Education Committee).—Consent.

St. Pancras, West.—A bay window at No. 1, Albert-terrace, Regent's-park (Mr. S. C. Castleman for Sir William Collins).—Consent.

Hackney, Central.—A building at the rear of No. 44, Mortimer-road, Kingsland, to abut upon Downham-road (Mr. J. M. Lester for Mr. J. B. Watts).—Refused.

Chelsea.—A one-story building on the forecourt of "Elgin studio," on the east side of Trafalgar-square, Chelsea (Mr. W. S. Frith).—Refused.

Width of Way.

Mile End.—A dwelling-house upon the site of No. 44, West-street, Mile-end Old Town, with external walls at less than the prescribed distance from the centre of the roadway of Williams-buildings (Mr. R. Button, jun., for Mrs. A. Louissan).—Consent.

Woolwich.—A one-story addition at the rear of Nos. 57 and 58, Baresford-street, Woolwich, with the external walls at less than the prescribed distance from the centre of the roadway of Ropeyard-rails (Messrs. W. Marriage and Co. for the Committee of the Woolwich Labour Institute).—Consent.

Line of Frontage and Construction.

Southwark, West.—An open iron and concrete gangway to connect the fourth floor of "Clink Wharf," Clink-street, Southwark, with the roof level of "Soho Works," on the south side of the street (Mr. R. H. Kerr for Messrs. Noel and Sons, Ltd.).—Consent.

Formation of Streets.

Lewisham.—That an order be issued to Mr. J. W. Webb, sanctioning the formation or laying out of two new streets for carriage traffic, to lead from Salehurst-road to Bexhill-road and Stinness-road, Lewisham).—Consent.

Space at Rear.

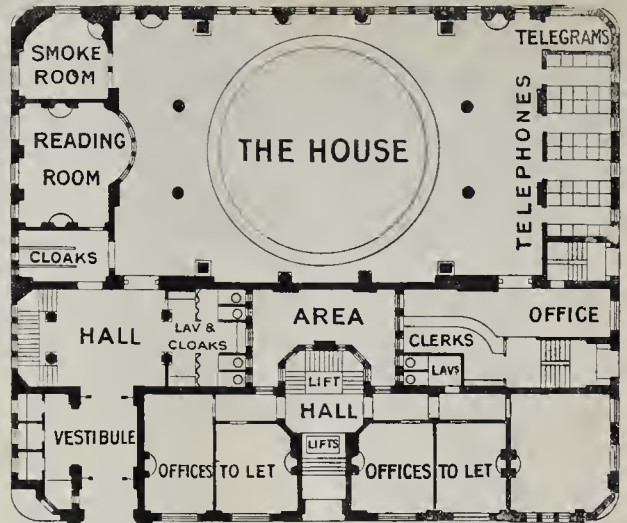
Greenwich.—An addition at the rear of No. 119, Humber-road, Westcombe-park, Greenwich (Mr. A. Roberts for Mr. W. Ballard).—Consent.

Deviation from Certified Plans.

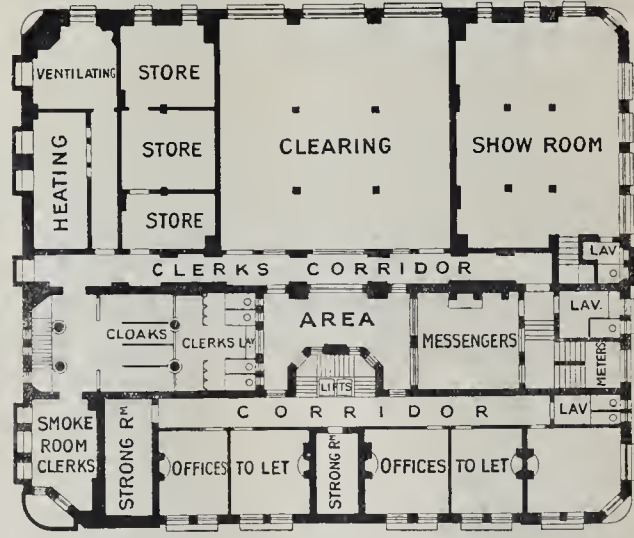
Chelsea.—Deviations from the plan certified by the District Surveyor, under section 43 of the Act, so far as relates to the proposed rebuilding of the hack division of No. 14, Cheyne-walk, Chelsea (Messrs. Smith and Brewer for Mr. O. Fleming).—Consent.

Strand.—Deviation from the plans approved in respect of the erection of a block of buildings on the site of Nos. 70, and 71, Jermyn-street, and 25, Bury-street, St. James's, so far as relates to an extension of the southernmost shop in Bury-street (Mr. R. Morphew for Mr. G. F. Harrington).—Consent.

Westminster.—A deviation from the plans approved in connexion with the rebuilding of the "Feathers" public-house on the site of Nos. 32 and 33, Great Chapel-street, Westminster, so far as relates to an increase in the height of the extension, over the roof of such



Ground Floor.



SCALE OF FEET.

Lower Ground Floor.

Manchester Stock Exchange. Plans (see page 43).

building, of a portion of Queen Anne's-chambers adjoining (Messrs. Rolfe and Matthews).—Consent.

The recommendations marked * are contrary to the views of the local authority.

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held on Thursday of last week. On the recommendation of the Streets Committee, the following tenders were accepted:—Messrs. J. Mowlem and Co., for paving the carriage-ways of West Smithfield, with granite sets, laid with bitumen joints, 1,987*l.*; for paving the footways of West Smithfield in a similar manner, 52*l.*; and 1,969*l.* for similar work in Long-lane. Tenders were also accepted from the French Asphalt Company for paving the carriage-ways of the following streets with Asphalt:—Oat-lane, 77*l.*; Whitecross-street,

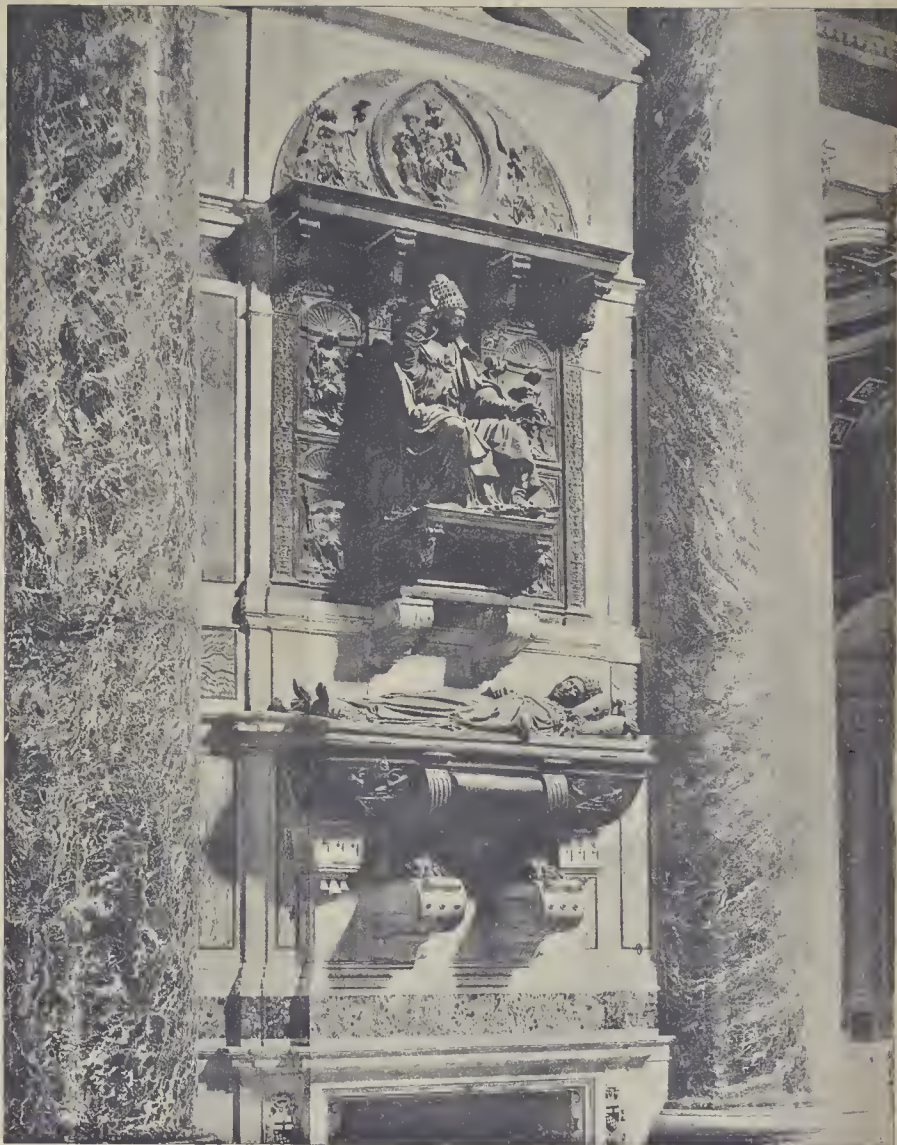
1,145*l.*; and White Hart-street, 55*l.* A tender was also accepted for 324*l.* from the Acme Flooring and Paving Company for paving the carriage-way of Cloak-lane with wood. Consent was given to the General Post Office authorities to the laying of nine 3/4-in. pipes from the Central London Railway subway (Bank Station), to the City and South London Railway Station at King William-street, and three additional 3/4-in. pipes from the Bank Station of the Central London Railway to the existing manhole at Wallbrook, and thence to the Queen Victoria-street subway.

Mr. Alderman Alliston, on behalf of the special committee appointed to consider the scheme for the construction of a barrage in the River Thames, reported the result of the interview which the committee had had with Mr. Balfour, with the purpose of pressing upon the right hon. gentleman the undesirability of proceeding further with the scheme until there



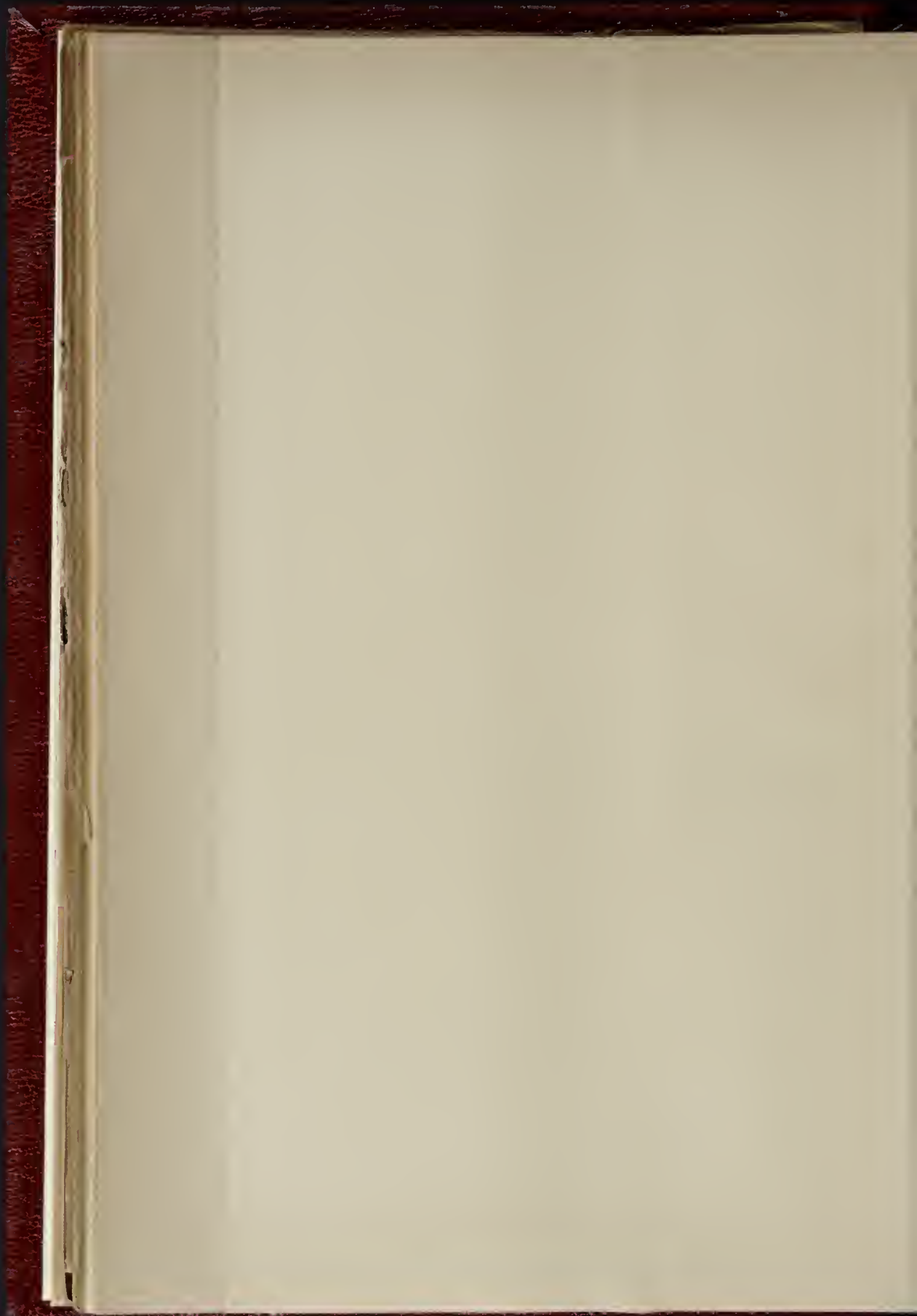
INK PHOTO, SPRAGUE & CO. L^Y 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

THE DOME OF ST PETER'S
(FROM A PHOTOGRAPH)



INK PHOTO, SPRAGUE & CO. L^Y 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

TOMB OF POPE INNOCENT VIII., ST. PETER'S
(FROM A PHOTOGRAPH)





Frank W. Simon del.

1/16 PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

SELECTED DESIGN FOR THE LIVERPOOL COTTON EXCHANGE — MESSRS. MATHEW & SIMON, ARCHITECTS.





BRADSHAW & GASS FRIDA
ARCHITECTS
31 CITY ROAD, E.C. & DOLTON

PHOTOGRAPHED BY A. C. L. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

SELECTED DESIGN FOR THE MANCHESTER STOCK EXCHANGE.—Messrs BRADSHAW & GASS, ARCHITECTS

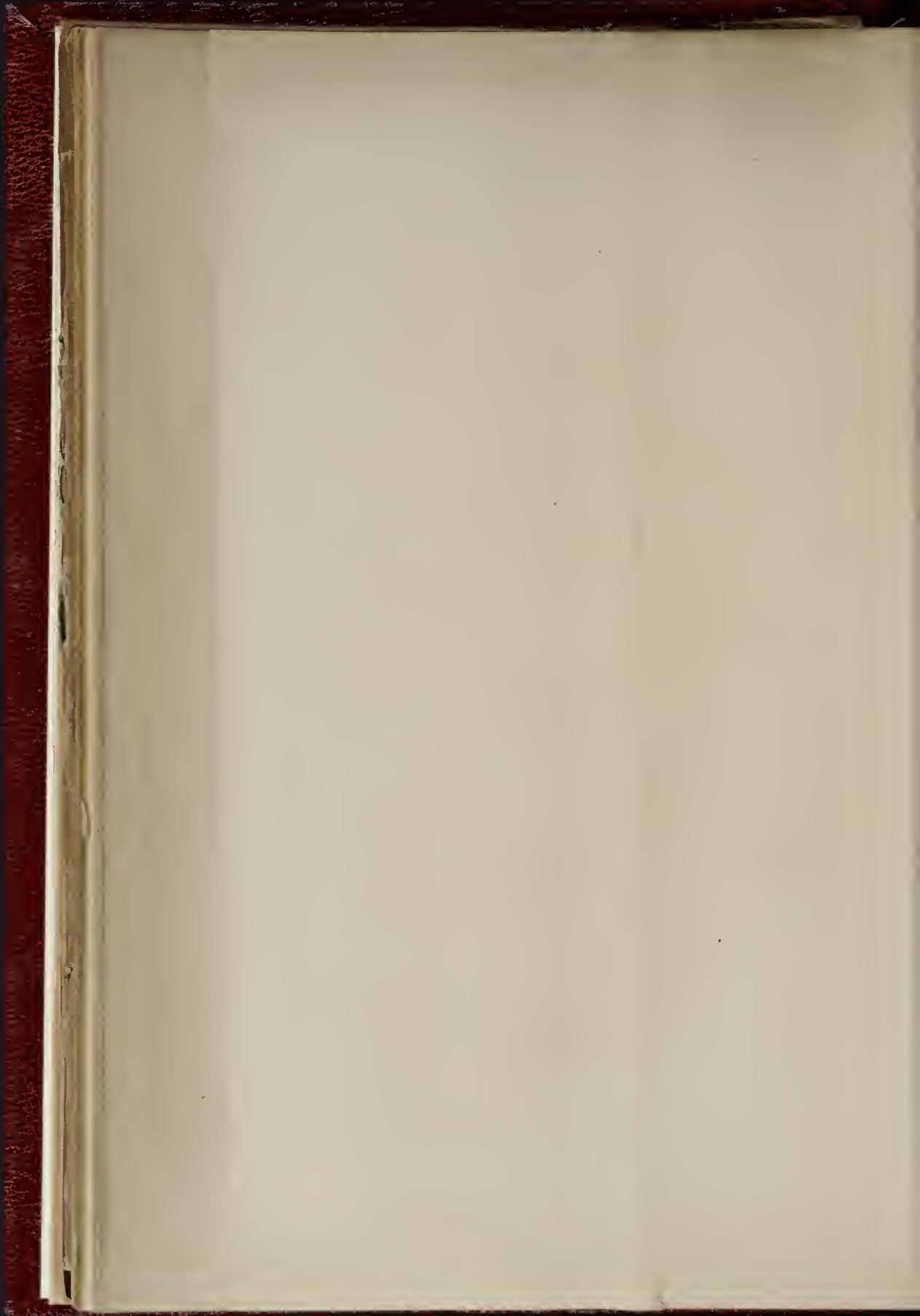




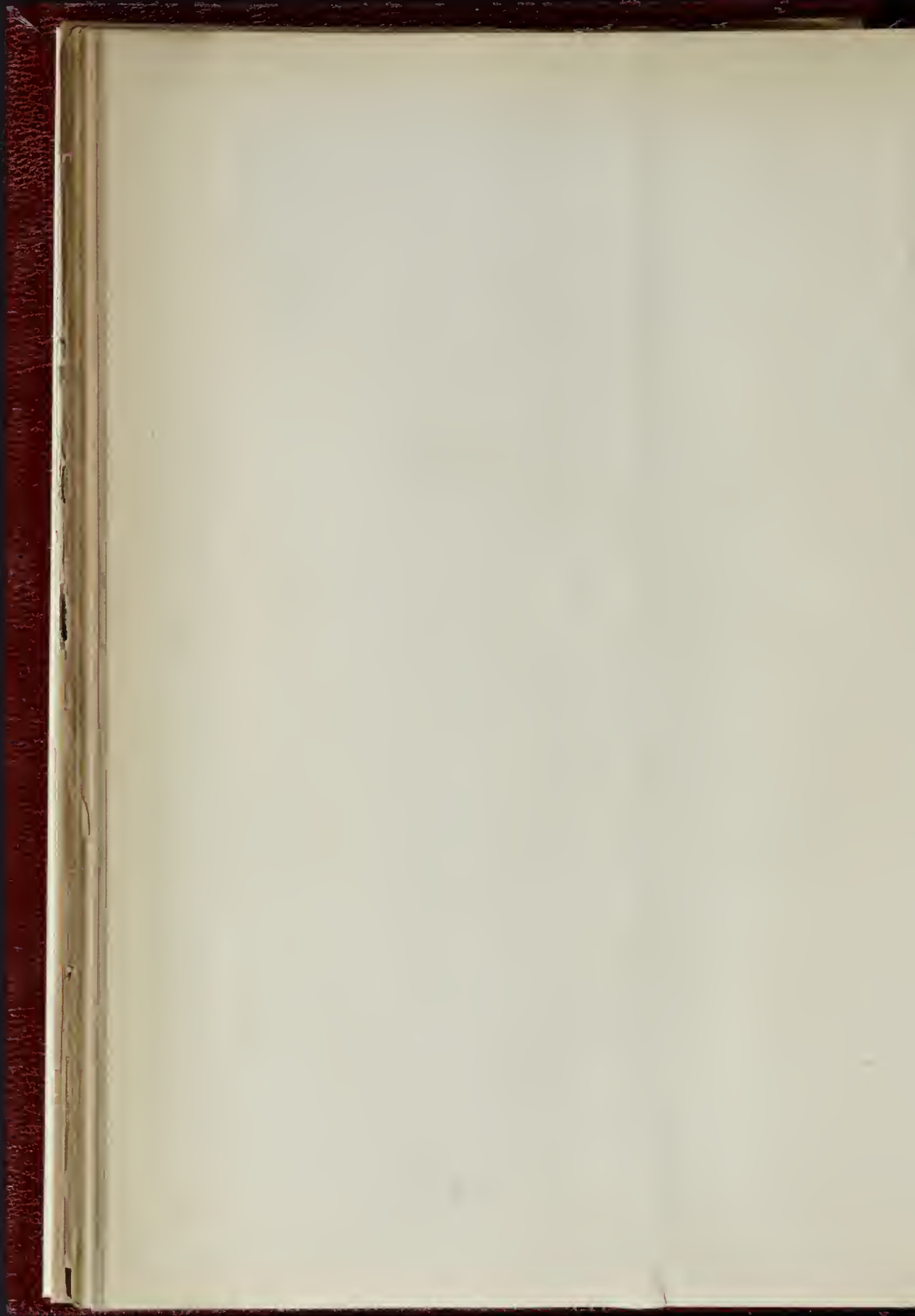
PHOTO THE SPURRY, E.C. 4, 443 EAST HINDING STREET, LONDON, E.C.

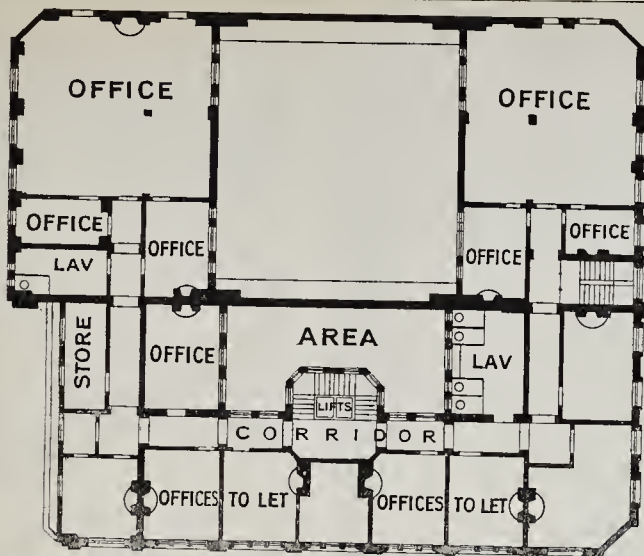
HOUSE AT WINTERSLOW
 NEAR SALISBURY,
 ALFRED H. HART ARCHT.
 P. L. WATERHOUSE, ENGINEER
 GRAVES INN, WILTS.



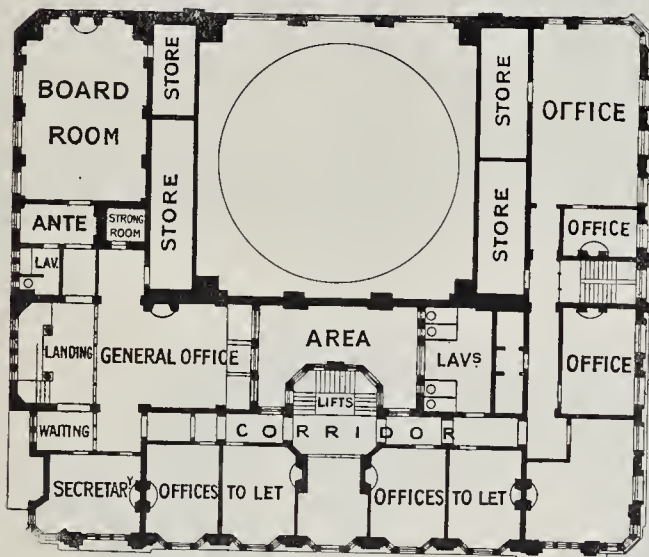
NO. 10 GIFF PARK PLACE, ST. JAMES, S.W.
 ALFRED H. HART, ARCHT.
 P. L. WATERHOUSE, ENGINEER

PHOTO THE SPURRY, E.C. 4, 443 EAST HINDING STREET, LONDON, E.C.





Second Floor.



First Floor.

Manchester Stock Exchange. Plans (see page 43).

BOOKS RECEIVED.

MEISTER DER INNEN-KUNST: a Portfolio of Drawings of Three Modern Country-Houses. (Alexander Koch, Darmstadt. 30s.)

THE ANNUAL OF THE BRITISH SCHOOL AT ATHENS. No. IX. Session 1902-1903. (Macmillan and Co. 21s.)

NOTES ON BLACKSMITH'S WORK. By Major R. F. Sorsbie, R.E. (W. and J. Mackay and Co., Chatham.)

NOTES ON STEEL CONCRETE. By Major J. Winn, R.E. (Royal Engineers' Institute, Chatham.)

COMPETITIONS.

STAMFORD FREE LIBRARY.—The outstanding questions between the Stamford Library Committee and Mr. Carnegie have been settled, and the time for sending in designs has been extended to July 30. Mr. H. T. Hare will act as assessor.

MORTUARY AND CORONER'S COURT FOR DEPTFORD.—Deptford Borough Council on Tuesday resolved to invite architects willing to submit designs for a proposed new mortuary and coroner's court to forward their names to the Town Clerk with particulars of any similar buildings erected under their supervision. The Public Health Committee will select twelve of these names, out of which the Council will choose three, the successful one of whom will be paid an inclusive commission of five per cent., and the two others ten guineas each. The cost of the buildings is approximately estimated by the Borough Surveyor at 4,000l.

SCHOOL, ACCRINGTON.—At a meeting on the 27th ult. the Accrington Education Committee considered competitive designs for the Hyndburn Park School. This school is to be erected to meet the needs of the north-west and part of the south-west wards of the borough. The site, which is about 5,000 square yards in extent, is on Steiner's Park, adjoining Hyndburn-road and Park-road. The school has to provide accommodation for about 1,050 scholars—750 in the mixed department and 300 in the infants' department. Besides provision for ordinary subjects, accommodation is to be made for instruction in science, woodwork, cookery, and laundry work. The plans had to be for a school on the central-hall principle. The competition was restricted to architects within ten miles of the borough. Mr. T. Mellard-Read was appointed the assessor. The first premium, amounting to 50l., was awarded to Messrs. Shaw and Vowles, of Burnley. They also obtained the second premium, whilst the third, amounting to 10l., went to Messrs. Fairbairn and Holt, of Blackburn. The committee also resolved that, subject to the printed conditions, Messrs. Shaw and Vowles, architects, Burnley, be entrusted with the erection of the school on the terms named therein.

BALSALL HEATH BATHS.—The Baths and Parks Committee, at its meeting on the 27th ult., considered the competitive designs sent in, and decided to recommend the City Council to approve of those submitted by Messrs. W. Hale and Son, Colmore Row, Birmingham. The estimated cost of the baths, including the necessary engineering works, is 30,000l. The baths will adjoin the Free Library in the Moseley-road, and it was specified by the committee that the design for the new building should harmonise, or, at least, not clash, with that of the library. Consequently the elevation designed by Messrs. Hale and Son provides for a building of red brick, relieved with buff terracotta, after the Renaissance style. The plans show a two-story elevation to Moseley-road, with three entrances, all of which will be under the control of one ticket office. The suites of private baths are provided on the Moseley-road side, the swimming baths being at the back, with the boiler stands between them. The first-class swimming bath will be 150 ft. long and 56 ft. wide, with a water area of 81 ft. by 32 ft. There will be 63 dressing-boxes, and a gallery will be provided for the accommodation of spectators on the occasion of sports and aquatic entertainments. The size of the second-class swimming bath is given as 85 ft. by 48 ft. 6 in., with a water area of 72 ft. by 32 ft. Here 95 dressing-places will be provided and also a soap bath. The plans also show a suite of 16 first-class private baths for men, and 6 for women. The second-class private baths are practically duplicates of the first class. Over the entrance to the men's department in Moseley road are two turrets, specially carried up for the purpose of ventilating the private baths.—*Birmingham Mail.*

had been a Board of Trade inquiry into its merits. He said it was to be regretted that the President of the Board of Trade had not been able to see his way to meet the request of the Corporation and the Conservators of the Thames as to holding a public inquiry. The report was adopted, and the committee were empowered to continue to oppose the Port of London Bill in every way possible.

WESTMINSTER CITY COUNCIL.

The usual fortnightly meeting of the Westminster City Council was held on Thursday last week at the City Hall, Charing Cross-road.

Trafalgar-square Sewer.—On the recommendation of the Works Committee, it was agreed to construct a 12-in. pipe sewer for draining the north side of Trafalgar-square, at an estimated cost of 400l.

Rutland-street Sewer.—It was agreed also, on the recommendation of the same committee, to construct a sewer in this street, at an estimated cost of 2,500l.

Victoria Station Enticement.—An application for the closing of Ecclestone Bridge, in connexion with this work, was, on the recommendation of the Committee, refused, until

Elizabeth Bridge should again be opened to the public.

Subway for Imperial Institute to Royal College of Science.—The Works Committee reported that, after negotiations, an arrangement had been arrived at with the Office of Works in regard to the construction of this subway. The arrangement was approved of by the Council.

Whitehall Paving.—The Committee submitted a lengthy report on the "failure of the contractor to repair" the red gum-wood paving in Whitehall, by the New War Office, and recommended that the work be carried out by the Council. This was agreed to.

Piccadilly Widening.—The improvements Committee submitted a report on this matter, but, after some discussion, the question was adjourned.

PRESBYTERIAN HALL, WALSALL.—The foundation-stone of a new Presbyterian hall has just been laid in Darwall-street, Walsall. The hall will be 57 ft. long and 24 ft. wide, and will accommodate about 300. The contract price is 900l. The builders are Messrs. Hall and Sons, Walsall, and the architects are Messrs. Bailey and McConnal, Walsall.

Correspondence.

PLENUM VENTILATION AND THE ROYAL VICTORIA HOSPITAL, BELFAST.

SIR,—We regret the necessity for taking up more of your valuable space, but, although many readers will estimate at their true value the statements of Mr. Bihy in your last issue, some may, without explanation, be misled, for his calculations are based on wrong data.

Through lack of space only a limited staff could be accommodated in the old hospital, nurses residing outside. In the new hospital ample provision is made for 300 patients and 100 resident staff, and, although the full complement is not yet made up, the heating, hot-water supply, and ventilating appliances are for the whole number, and, for very good reasons, have been kept going since the buildings were completed; hence the comparison should properly be made between the total accommodation in the old and that in the new hospital.

However, we have on no occasion claimed that efficient ventilation by mechanical means, with adequate heating, can be maintained at the same rate of expenditure as haphazard ventilation and inadequate heating, because it is a well-ascertained fact that change of air within a building during cold weather implies proportionate expenditure of heat, whether mechanism be employed or not to effect that change.

What has been proved at Belfast is that a complete hospital can be erected and equipped with ventilating appliances by which definite change of air is secured from seven to ten times an hour, with adequate heating, at a cost quite one-third less than has been expended on hospitals in which no provision has been made for ventilation on any definite principle. Such a saving in initial outlay leaves a large margin for necessary annual expenditure on efficient heating and ventilation.

We regard Mr. Bihy's other statements equally as unreliable as on this question or coal consumption, and are therefore content to leave to impartial judgment the actual comfort, convenience, or cheerfulness of this in comparison with any other hospital.

WM. HENMAN and THOS. COOPER,
Architects.
HENRY LEA and SON,
Consulting Engineers.

OBITUARY.

MR. FREEMAN.—We regret to hear of the death, on June 23, in his sixty-sixth year, of Mr. Richard Knill Freeman, of Diocesan-chambers, No. 51, South King-street, Manchester, and of No. 17, Wood-street, and No. 114, Radcliffe-road, Bolton. Mr. Freeman, who was Surveyor for the Diocese of Manchester, was elected a Fellow of the Royal Institute of British Architects in 1882; he was a Fellow of the Manchester Society of Architects, and twice served as President of that society. Having begun his professional career at Derby, he removed thence to Bolton, where he established a leading and extensive practice in Lancashire and the adjoining counties. Of some of his principal architectural works, the following have been illustrated, and with plans, in the *Builder*:—Church of the Holy Trinity, South Shore, Blackpool (August 21, 1886; and April 6, 1889, interior); Graythwaite Hall, Windermere, for Lieut.-Colonel Myles-Sandys, M.P. (June 11, 1887; and the stables, December 7, 1895); "Bryerswood," Windermere, for Mr. J. R. Bridson (January 23, 1888); Ribbleson Church, near Preston, Lancs. (March 10, 1888); a house at San Remo, for Dr. Freeman (April 6, 1889); West Hartlepool Municipal Buildings, 1888-9 (May 11, 1889—interior of the Council Chamber); St. Augustine's Church, Tonge Moor, Bolton-le-Moors (May 2, 1891); the Free Library and Museum, Derby (July 17, 1897; No. VIII. of our series "The Architecture of our Large Provincial Towns"); and St. John the Baptist Church, at San Remo, after the fire in 1899, for which Signor Gastaldi, of San Remo, acted as local superintendent of the work (November 3, 1900). On January 28, 1888, we published an illustration of Moreton Old Hall, Cheshire, after a water-colour drawing by him, and on March 7, 1896, we illustrated his plans and designs for the Central Higher Grade School for 1,080 children in Great Moor-street, for the Bolton School Board, in respect of which he won the first premium. Twenty years ago, Mr. Freeman restored the interior of the Church of St. Mark, Worsley, built after Sir G. G. Scott's designs in 1846; he was the architect of the churches of St. Luke, Deepdish, Rochdale, 1887-97; All Saints, Moses Gate, Farnworth, near Bolton (1887); St. Paul, Marton, Lancs., as rebuilt and greatly

enlarged (1899-1900); St. Jude, Preston (1893); SS. Simon and Jude in Rishton-lane, Great Lever, Bolton, with the parsonage and schools (1899); and St. Katharine, near Chorley New-road, Horwich, of which the nave, side aisles, vestries, and temporary chancel were completed, for 600 sittings, in May, 1902. He prepared the plans and designs for the Infirmary near the public park in Spa Fields (opened in October, 1883); the Chadwick Natural History Museum buildings in Queen's-park (opened in June, 1884); the Corporation's Public Baths (1896); and the Church Army Labour and Settlement Home—Bolton; St. Margaret's Church, Hollinwood, near Oldham; the enlargement of the parish church at St. Anne's-by-the-Sea; the Wesleyan Church and schools at Pendleton; and for houses, local improvements, and so on, at South Shore, Blackpool; the schools of the Church of St. Stephen and All Martyrs, at Lever Bridge, Stone; and the pavilion, to hold 2,000 persons, on the pier at Stockport. He made the designs for the sedilia and paneling with credence in St. Luke's Church, at Deepdish, Rochdale. Amongst Mr. Freeman's more recent work we may instance the enlargement and improvement of the Nurses' Home in St. George's-road, Bolton; the St. Job's Church schools, for 800 pupils, at Farnworth-with-Kersley, Lancs.; the lych-gate, West Houghton Church, erected as a memorial of the reign of Queen Victoria, and the Coronation of King Edward VII.; the chancel, organ-chamber, etc., at Horwich Church, in memory of the late Rev. H. S. Pigot; the organ-chamber, Ringley Parish Church; and, at Christ Church, Heaton, the organ-chamber, screens, and traceried canopy of the ornamental screens in the west end of the church. In January, 1902, he acted as assessor, on behalf of the Manchester City Council, in the competition for the buildings at the Withington Cemetery, on which occasion his awards were confirmed. Messrs. Cunliffe and Freeman were architects of the Church of St. Mark, Bolton, 1871. During the past two or three years, Messrs. R. Knill Freeman and Frank Freeman have been employed as architects for the reconstruction and extension of the shore end of the central pier at Blackpool with a widening of the main frontage and deck, and new entrance buildings, pavilion, arcade, and pier promenade, for which Mr. R. Knill Freeman's



INTERIOR VIEW OF EXCHANGE

Selected Design for Manchester Stock Exchange: Sketch of Interior (see page 43).

DESIGNED BY A. H. H. P. F. R. A. S.
ARCHITECTS
25, CITY ROAD, E. C. 4,
LONDON.

designs were chosen by the Blackpool Jetty Company in a limited competition in 1897, the new works forming portion of a scheme for the improvement of the shore promenade, etc.; the alteration and enlargement of the parish church at Ashton-on-Ribble; Crooke Hall, for Mr. Carlton Cross; Read Church, near Blackburn; and Croston Church, near Preston; new churches at Ashton, and Bickershaw near Hindley; a tower at the parish church, Hillwood; the rebuilding of the schools at Kirkham; and the carrying out of an extensive project for improving the shore end of the pier at Southport, which includes various new buildings and the setting back of the frontage of the promenade along the shore.

MR. WATTS.—Mr. George Frederik Watts, who died last Saturday at Little Holland House, which he built for himself twenty years ago in Melbury-road, Kensington, was born on February 23, 1817, his father being of Welsh descent. In his boyhood he painted some illustrations for the novels, and made a composition for the fight for the body of Patroclus. Having studied during a short while in the Royal Academy Schools, he entered the studio of William Behnes; but he often avowed that his real teachers were the Elgin marbles. After the dissolution of his marriage with Miss Ellen Terry, he married, in 1836, Miss Mary Fraser-Tytler, of Alderley, co. Inverness. He declined, in 1835 and 1834 offers of a baronetcy; he was elected A.R.A. and R.A. in the same year (1837); he received the honorary degrees of LL.D. and D.C.L. from the Universities of Cambridge and Oxford, Knighthood of the Legion of Honour and the Order of San Luigi, Lucca, and was amongst the first twelve upon whom the King bestowed the Order of Merit. Mr. Watts's first exhibits at the Royal Academy consisted of two portraits of ladies, and "The Wounded Heron," 1837. When twenty-five years old he won a prize of 300*l.* for a cartoon design of a fresco for the Houses of Parliament, of Caractacus led in triumph through the streets of Rome. He thereupon went to Italy, settling in Florence. On his return in 1846 he gained a premium of 500*l.* in the competition for decorating the House of Lords, and was commissioned to paint the frescoes of "St. George and the Dragon," and "Alfred inciting the Saxons to resist the landing of the Danes," for which he won a first prize. He exhibited in 1849 a cartoon "The people who sat in darkness have seen a great light"; his offer of a fresco for the hall of Euston terminus was declined. In other public buildings of London his work may be seen: at St. Paul's; Lincoln's Inn hall (to which he presented the large fresco of "The School of Legislation"); at Aldersgate, where he built, in the churchyard of St. Botolph, a cloister to commemorate deeds of self-sacrificing heroism in everyday life—he termed it an "open book of worth"; and at St. Jude's, Whitechapel, a mosaic replica of his picture of "Time, Death, and Judgment." Of Mr. Watts's pictures there are examples in the National Gallery, the Burlington House Diploma Gallery, and the Luxembourg, and at Munich. The twenty-nine in the National Portrait Gallery include portraits, painted at his own instance, of Panizzi, Mr. George Meredith, Carlyle, Dr. Martineau, J. S. Mill, Matthew Arnold, Sir Henry Taylor, Wm. Morris, Mr. Swinburne, and Lords Lawrence, Lyndhurst, and Stratford de Redcliffe. Lady Henry Somerset owns his portrait of Lord Tennyson, painted some forty-five years ago; and the list under this head includes those of Mrs. Ionides, Lady Holland, Lord and Lady de Vesci (a recent work in chalk), Browning, W. E. Gladstone, Joachim Rossetti, and Cardinal Manning. To the Tate Gallery he presented as many as twenty-six examples in the everyday part of his life's work; we can but cite his ideal and didactic pictures of "Love and Life"; "Love and Death"; the trilogy of Eve, with "Eve Repentant"; "Jonah"; the "Young Man who had great Possessions"; "Time, Death, and Judgment"; "Death Crowning Innocence"; "Faith"; "Hope"; "Charity"; "The Court of Death"; "Life's Illusions"; "Mammon"; and "The Minotaur." Amongst his legendary and mythological subjects we may mention the "Story from Boccaccio"; "Orpheus and Eurydice"; "Goddesses Three"; "Birth of Jupiter"; and "Endymion and Diana," of which the larger-sized version is at present in the New Gallery. His sculptured works include the "Clytie," "Hugh Lupus," an equestrian group, executed for the late Duke of Westminster, "Physical Energy," in the current year's R.A. exhibition, and the monumental figures of Bishop and Lichfield in Lichfield Cathedral, and Lord Lothian in the parish church of Bickling. The gallery of his country seat, "Limmerslease," at Compton, in

Surrey will, it is understood, become the property of the country. A notable exhibition of his own works was held, 1832, in the Grosvenor Gallery, New Bond-street. Some time ago Mr. Watts gave a version of his "Love and Death" to the Whitworth Institute, Manchester.

GENERAL BUILDING NEWS.

CHURCH, WOODHALL SPA.—In 1893 the foundation-stone of the new church of St. Peter was laid by the Right Hon. Edward Stanhope. At that time only a nave and north aisle were built, and the church has now been completed by the addition of a chancel, organ chamber, and vestry, the whole fabric costing about 3,700*l.* The architect is Mr. C. Hodgson Fowler, of Durham, and the contractors, Messrs. Dowman and Son, of Stamford. The building is of red brick.

CHURCH, BRONDESHURY.—Princess Henry of Battenberg recently laid the memorial stone of St. Anne's Church, Brondeishury, which is being built from the designs of Mr. Cutts. It will take the place of a temporary iron building which was erected four years ago. The seating accommodation to be 500.

ABERGWILLI PALACE.—The work of restoration of Abergwili Palace, the residence of the Bishop of St. David's, is to be undertaken immediately. Mr. V. D. Caroe, architect to the ecclesiastical Commissioners, has prepared the plans.

SCHOOLS, MIDDLESBROUGH.—The design of Messrs. Forrester and Wylie, architects, of Middlesbrough, and Hartlepool, for schools proposed to be erected in Marsh-road have been accepted.

PRIMITIVE METHODIST CHAPEL, SCARBOROUGH.—The new Primitive Methodist chapel, in Seamer-road, Scarborough, was recently opened. The new building is of red brick, with stone facings. The ground floor will accommodate 275 persons, and there are two aisles, with pews on either side and in the middle. The gallery has accommodation for 180 persons. The choir and organ are placed immediately behind the rostrum, and there is accommodation for a choir of over fifty. The transepts and other seats provide seating for sixty persons, making a total accommodation of 553. There is also provided a minister's vestry, etc. The architect was Mr. J. Caleb Petch, whose plans were selected in competition, and the contractors, Messrs. Hunter and Smith, brick, masonry, and plastering; Mr. T. Wilcox, joinery; Mr. W. Wodpon, slating; Mr. J. C. Gill, plumbing; Messrs. Appleby and Brogden, iron work; and Mr. Jas. Carr, painting. The cost of the whole building is 1,600*l.*

SCHOOLS, UPPER RHYMNEY.—A new school, under the auspices of the Bedwelly School Board, on the Monmouthshire side of the Rhydney Valley, was opened recently at Upper Rhydney as an infants' department. The new school provides accommodation for 260 infants, with provision for future extension for forty. There are five class-rooms opening on to a central hall. The contractor was Mr. David Davies, of Trade-street, Cardiff, and the total cost a little over 4,000*l.* Messrs. James and Morgan, of Cardiff, were the architects.

NEW INDUSTRIAL SCHOOLS, LANCASTER.—The new industrial schools, which have been erected in connexion with the Royal Albert Asylum, Lancaster, were recently opened. Mr. T. E. Eccles, architect, of Liverpool, prepared the plans for the work, and the cost has been about 7,000*l.*

MUNICIPAL BUILDINGS, INCE.—The new municipal buildings, which have been erected at Ince, have just been opened. The building is of pressed brick and Rushton red terracotta, and roof covered with blue slates. The main entrance, which is in Ince Green-lanes, has circular pillars on each side, and carved frieze above. The building is two stories in height, besides basement with open area, and has the following accommodation:—In the basement—caretaker's quarters, living-room, scullery, pantry, and two bedrooms, also stores, heating cell, hoist, etc. On the ground floor—entrance hall, separate offices for the following officials:—Clerk, assistant clerk, overseer, collector, secretary to Education Committee, and committee-room for the latter, school attendance officer, waiting-rooms, lavatory, etc., and large spare room to be used as required for any special public functions. Behind the main building is the large public hall, 67 ft. long and 35 ft. wide, with retiring-rooms on each side. The large hall is 23 ft. to the ceiling, with open timber principals and ornamental plaster ceiling. Seating accommodation has been provided for about 500 people, and a platform. At the platform on the first floor is the Council chamber, 35 ft. long by 20 ft. wide, and 16 ft. 6 in. from floor to ceiling. There is also a committee-room,

23 ft. long by 16 ft. wide, chairman's parlour, surveyor's office, drawing office, plan-room, waiting-room, medical officer, nuisance inspector's office, two spare rooms, lavatories, etc. The staircase from the hall to the first floor is of stone, with wrought-iron balusters and polished oak handrail. The floors in corridors on each floor are in granolithic mosaic with ornamental tile dados. The work has been carried out by Mr. A. Wigan, builder, Ince, with the exception of plumbing and decorating and plastering, the former being done by Messrs. Gaskell and Sons, Millgate (who have also done the heating apparatus throughout the building), and the latter by Messrs. Livesey and Parkinson. All the work has been in accordance with plans and details made by and under the supervision of the architects, Messrs. Heaton, Ralph, and Heaton, Wigan.

MASONIC HALL, AVONMOUTH.—A new masonic hall is in course of erection on a site in Port-view-road, Avonmouth. The new building will be two stories in height; the temple being on the first floor. The robing-room and dining-room will be separated by a movable partition, which, when folded back, will enable a company of about 100 to be accommodated on the ground floor. There will be lavatory appliances on the same floor, and leading from the vestibule will be a flight of stairs to the tyler's hall, retiring-room, and temple above. The building is to be in the Renaissance style, and will be of bricks, with freestone dressing, and a tiled roof. Provision is made for future extension in the shape of a kitchen on the ground floor, communicating with the dining-room. Messrs. W. and J. Bennett, of Bristol, are the contractors, and the architect is Mr. J. A. Wright, also of Bristol. The cost of the hall is estimated at about 2,000*l.*

NEW MARINE LABORATORY, CULLERCOATS, NORTHUMBERLAND.—It is proposed to erect new marine laboratory at Cullercoats, in place of that destroyed by fire. The plans for the work have been prepared by Messrs. Oliver, Leeson and Wood, architects, Newcastle, and the estimated cost is 5,000*l.*

CLUB PREMISES, GOLDWICK, OLDHAM.—The foundation-stone of the new premises of the Marlboro' Conservative Club, at Goldwick, was laid recently. The building, now in course of erection, occupies a corner plot facing Abbey Hills-road and Mustard-street, and has a frontage to the main road of 16 yds. The club comprises a billiard-room, with smoke-room, conversation-room, bar, lavatory, etc., on the ground floor; and on the first floor will be the assembly hall for public meetings, dances, etc., with retiring-rooms opening off the staircase landing. The entrances are from Abbey Hills-road, the club entrance and the entrance to the assembly hall being apart. The assembly-room floor will be boarded with maple floor boards, tongued and grooved, and specially nailed. The contractors for the whole of the works are Messrs. F. Spencer and Co., Moorhey-street, while the following are the sub-contractors:—Brickwork, Mr. Jarvis Bewley; masons, Messrs. Bebbington; slater, Mr. R. Wood; plasterer, Mr. J. Glynn; plumber and glazier, Mr. Stanley Bates. The architect for the building is Mr. Arthur Turner, Oldham.

RENFREWSHIRE COMBINATION POORHOUSE.—The memorial stone of the new combination poorhouse for the County of Renfrew was laid recently. The poorhouse, which was designed by Messrs. M'Whannell and Rogerson, architects, Glasgow and Barbead, is being built on the pavilion system, and the material used is Bothwell Park bricks, faced with Ciegghorn terra-cotta bricks, and red-stone dressings. The following beds are provided:—Female ward, 110; male ward, 117; children's ward, 36; and probationary ward, 22; total, 285. There is an administrative block and other offices, and provision has been made for future extension, including an hospital. The total cost of the buildings is estimated at 42,750*l.*

INFECTIOUS DISEASES HOSPITAL, RATRAY.—On the 23rd ult. the Infectious Diseases Hospital, which has been erected at Ratray for the burghs of Blairgowrie, Alyth, Coupar-Angus, and Ratray, was formally opened. The hospital was erected from the plans of Mr. Luke Falconer, architect, Blairgowrie, at a cost of about 5,000*l.*

CREMATORIUM, SHEFFIELD.—The new Crematorium, at Sheffield, is being erected by the Corporation at the City Road Cemetery, and takes the form of an "annexe" to the existing chapel on the Nonconformist side. This chapel was built, along with the one for the Church of England on the other side of the cemetery, and the entrance gateway and the crematorium, in 1880, for the late Sheffield Burial Board, from the designs of Messrs. M. E. and C. Hadfield, architects, and the present building is the joint work of Mr. C. Hadfield and

Mr. C. M. Hadfield. The new building is designed so as to harmonise with the chapel to which it is attached, and takes the form of a square chamber, 36 ft. by 36 ft. inside, large enough to accommodate two cremating furnaces. One only is being installed at present. The building is fireproof, being roofed with an octagonal dome of stone ribs and concrete, covered with roofing slabs of artificial stone in place of slates. It terminates in a stone lantern. Through the centre of this lantern the main furnace shaft is carried up. Light is also derived from four large windows on each face of the cremating chamber. Beneath the cremating chamber is a basement, which is required to contain the lower portions of the furnaces, flues, etc. The building is being erected by Messrs. D. O'Neill and Son, contractors; the furnace and working arrangements being provided by Messrs. H. Simon, Ltd., of Manchester.

EXTENSION OF THE VICTORIA INFIRMARY, GLASGOW.—Progress is being made with the additions to the Victoria Infirmary at Langside. The new ward pavilion consists of four stories, and has a southern exposure. On each floor there will be a ward containing about eighteen beds, and, in addition, branching off are two small wards, while to the back provision is made for all the necessary offices. The day-room at the end faces Battlefield-road, and is built on the half-circle plan, with doors on each flat opening out on to the outside balcony, which follows the contour of the outer wall. The extensions also include a nurses' home, which will provide accommodation for about thirty bedrooms and parlours. The additions, which are of white sandstone, are similar in style to the original design for the infirmary, and Mr. H. E. Clifford, architect, Glasgow, prepared the plans for the work.

FOREIGN.

FRANCE.—The statue of George Sand, by M. Sicard, has just been unveiled in the Luxembourg Gardens.—The Académie des Beaux-Arts has awarded the prize founded by the late Antoine Bailly to M. Cordouan, the President of the Société Royale des Architectes du Nord, for his fine *Hôtel de Ville* at Dankeque.—Among the "Envois de Rome," the exhibition of which has just been opened at the Ecole des Beaux-Arts, may be specially mentioned a set of plans for a "Cité Industrielle," by M. Tony Garnier, who last year sent the plans for a "Cité Ouvrière" which were refused as being too modern to find place among the classical studies which form the bulk of the students' work.—A monument to Garibaldi is to be erected at Paris.—The bust of Victor Hugo, by Dalou, has been placed in the Palais Bourbon, in the gallery called "Des Quatre Colonnes."—M. Soldi, the sculptor, has completed a model to be distributed among the members of the Société des Gens de Lettres. It bears two figures symbolising "L'Ecrivain" and "La Pensée," with a panorama of Paris as background.—The bell-tower of the Cathedral of Chartres is undergoing important repairs.—The ancient fortifications of the town of Aigues-Mortes, which were the property of the War Department, have now passed into the custody of the Fine Arts Department and have been classed among the "Monuments Historiques."—The sculptor Dubois has been commissioned to execute a monument to Eugène Fromentin, the painter, which is to be erected at la Rochelle. It will consist of a portrait bust on a column, in front of which is to be a figure of an Arab horseman.—The new Casino at Cannes, of which the cost is estimated at a million and a half of francs, is to be built on the beach, eastward of the Albert-Edward jetty. The Casino will be entirely surrounded by a garden.—The death is announced, at the age of eighty-three, of the Marquis de Barthélemy, member of the Académie des Inscriptions et Belles Lettres, and well known for his learned studies in numismatics and in the religious and feudal archeology of the Loire district, of Burgundy, and of Brittany. He was also author of some important papers on heraldry.—The death is also announced, at the age of thirty-one, of M. Charles Carpeaux, son of the eminent sculptor, who died at Saigon mainly from the effects of overwork in carrying out the various archeological missions entrusted to him by the Department of Public Instruction.

GERMANY.—The memorial to Bismarck, at Bremen, is being carried out by Adolf Hildebrand.—Professor Johannes Otzen has been elected President of the Royal Academy of Arts, at Berlin.—A new synagogue is to be built at Frankfurt, for which designs are being sent in, and for which a first premium of 4,000 marks, a second of 2,500 marks, and a third of 1,500 marks are being offered.

AUSTRIA.—The sculptor, Herr Hans Boursstaler, of Vienna, has undertaken to model and execute a monument to the Emperor Francis Joseph, in Carrara marble; the monument is to be unveiled on October 4.—A number of Viennese sculptors have been invited by the Minister of Education to send in plaster models of a memorial to Stelzhamer, the Austrian poet.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. H. T. Fowler, architect, Ramsdensquare, Barrow-in-Furness, has taken over the practice of Mr. J. X. McIntosh, of 6, Cornwallis-street, Barrow, and is removing his offices to that address.

SOCIETY OF MINIATURE PAINTERS.—The King has given his consent that this Society, which exhibits periodically at the Modern Gallery in Bond-street, should for the future assume the title of "The Royal Society of Miniature Painters."

THE LABOUR MARKET IN THE COLONIES.—The July circular of the Emigrants' Information Office states that in *Canada* the building, metal, engineering, shipbuilding, and manufacturing trades generally have been busy, and skilled mechanics have had no difficulty in procuring work at good wages; but the Minister of the Interior telegraphed from Ottawa on May 31, "Only persons wishing to engage in farming or farm labour, for whom there are abundant openings, should go to Canada at present." Experienced coal miners can get employment in Nova Scotia and British Columbia. In *Australia* there has been an excellent harvest everywhere, which has improved prospects generally, but there is little demand for more labour, and the supply of mechanics and miners is quite sufficient. The last reports from *New Zealand* show that the local supply of labour is for the most part sufficient. No persons are now allowed to land in *Cape Colony* unless they have secured definite employment in the Colony, and possess 20*l.* on arrival, or have permits to enter the Transvaal or Orange River Colony. The labour market is overstocked, and a great many mechanics and labourers are unable to obtain work. Labour in *Natal* is plentiful, and large numbers of unskilled workers and indifferent tradesmen are unable to obtain employment. Over 100 men have been discharged from the railways, and forty-four hours a week are now being worked instead of forty-eight. Emigrants, therefore, other than those obtaining nominated passages, are warned against going to Natal at the present time on the chance of work. No one can enter the *Transvaal* without a permit, and persons are warned against going there at the present time in search of work. Trade is depressed, and many workmen are leaving the country. In the *Orange River Colony* there is very little demand for skilled mechanics, and none at all for second-class hands or general labourers.

VICTORIA AND ALBERT MUSEUM.—The loan exhibition of paintings by George Morland now on view will be closed after Sunday, July 10.

THE DEANERY, MANCHESTER.—A scheme has been approved by His Majesty in Council whereby the house at present occupied by Dean Maclure in Bury New-road, Higher Broughton, Manchester, will, together with certain additional garden ground, be purchased as a residence for the Deans of the Cathedral Church. The price of the house and garden ground amounts to 5,500*l.*, and the cost of certain improvements, alterations, and incidental expenses amounts to about 750*l.* These charges will be defrayed out of moneys now held by the Ecclesiastical Commissioners on behalf of the Dean and his successors, complemented by a sum of 2,500*l.* (being not more than two years' net income of the deanery) to be raised, upon the security of a mortgage of the revenues of the deanery, by a loan at 4 per cent. from the Governors of Queen Anne's Bounty.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual outing of the Bristol Master Builders' Association and friends recently took place to Chepstow and Raglan. The party, numbering about seventy-five, left the Joint station in saloon carriages. When they arrived at Chepstow they were conveyed to Raglan, a distance of sixteen miles. At the Beaufort Arms Hotel, Raglan, luncheon was partaken of, and then the ruins of the castle were inspected. Upon the return to Chepstow there was dinner at the Beaufort Arms Hotel, Mr. E. I. Neale (President of the Association) in the chair. The President, having submitted the loyal toast, said that members of the Association would remember that soon after entering on his year of office he mentioned that it was becoming usual with such organisations to

have a chain of office for the President to wear at public functions. He then proposed to the Association a gift of a medallion on the condition that the Association provided a suitable chain for it, which the Association accepted. He then instructed a well-known London company of goldsmiths to make a gold medallion representing the Bristol coat of arms, and it now gave him great pleasure to ask their esteemed member, Mr. Geo. Wilkins, to receive the medallion on behalf of the Association. Mr. G. Wilkins, on behalf of the members of the Association, tendered hearty thanks to the President for his gift. He then placed the chain, to which the medallion was attached, around the President's neck. Mr. R. F. Ridd submitted the health of the ladies and visitors, and Messrs. Cotterell and Brown, whose names were associated with the toast, briefly responded. The health of the President, proposed by Mr. W. Morgan (Cardiff), and acknowledged by Mr. Neale, brought the proceedings to a termination.

CAPITAL AND LABOUR.

GLASGOW MASONS.—A strike is threatened in the building trade in Glasgow and district. Recently the operative masons, of whom there are over 3,000 in the district, made a demand for an eight hours' day. This the employers refused to grant, and accompanied their refusal with an intimation of a reduction of a halfpenny per hour, bringing the wages down to 3*d.* per hour. At a meeting on the 23rd ult., attended by about 2,000, the operatives agreed to withdraw their demand for shorter hours, and by more than a two-thirds majority resolved to strike if the employers do not withdraw their intimation of reduced wages. For the last eighteen years wages and hours in the trade have been adjusted by an annual conference and agreement.

Legal.

CITY ANCIENT LIGHT DISPUTE.

The case of Savill and others v. the City Offices Company, Ltd., came before Mr. Justice Buckley in the Chancery Division on June 29 and 30, an action by the plaintiffs to restrain the defendants from erecting certain buildings in the City in such a way as to substantially interfere with the plaintiffs' ancient lights.

Mr. Buckmaster, K.C., and Mr. Lawrence appeared for the plaintiffs, and Mr. Ralph Neville, K.C., Mr. Astbury, K.C., and Mr. Whinney for the defendants.

Mr. Buckmaster said the plaintiffs were the freeholders and leaseholders of premises known as No. 34, Leadenball-street, E.C., and defendants were the owners of No. 27, Leadenball-street, which immediately adjoined No. 34 upon the western side. Plaintiffs built their premises as they now were in 1872, and in order to obtain the largest possible amount of space and light, they erected their buildings so that they had three areas, which cut into the buildings and ran east and west. The rooms that looked into these areas were very valuable in the city, and the rents were very high. But the direct light they got was entirely the light they received coming in a south-west direction over the defendants' buildings. There was a party wall between the buildings which ran to a height of 38 ft. and this, by agreement, had been demolished. This party wall was an important factor in the case. The defendants had now taken down their old buildings and had proceeded to build the present buildings, and, so far as his instructions went, they would be 30 ft. higher than the old buildings. The result of this would be that these new buildings would materially interfere with the light of the plaintiffs' windows. It was the plaintiffs' case that the most important part of their light came over the roofs of the old houses of the defendants. Then as to the party wall.—The defendants said that, if that had remained in position, the light to their windows would have been diminished to a greater extent than by the new buildings, which were further off. But the plaintiffs' evidence would show that such was not the case. The defence set up was that the defendants' buildings would not diminish the light of the ground floor of the plaintiffs' buildings; but it would slightly as regarded the first floor, but not at all in regard to the other floors. His contention, on behalf of the plaintiffs, was that defendants' buildings would interfere with their lights on the ground and first and second floors.

Mr. H. T. Smith, an architect and surveyor, gave oral evidence that the defendants' proposed buildings would materially affect and injure the light of the plaintiffs' premises.

Cross-examined by Mr. Neville, Witness said that forty windows in the plaintiffs' premises would be injured by the defendants' proposed buildings. Not every one of the rooms lighted by those windows would be so injured as to be less fit for occupation as city offices. His calculations had been based on the assumption that the wall was still standing up to the height of 33 ft.

Which are the windows which you say are injured to the greatest extent?—Undoubtedly the windows on the first and second floors of the block between areas "C1" and "C2."

Cross-examination continued, They were the windows in the central block. The rooms lighted by the windows were used as commercial offices. He considered that the rooms as City offices were not well lighted under existing conditions. They were fairly well lighted. The tests which he had made were taken at various times from July of last year. The ground floor was badly lighted, and worse than the first floor. The second floor had a much better light. He noticed a difference in the light when the defendants' buildings were down. Then there was a much greater amount of diffused light. The reduction of light would materially affect the letting and selling value of the plaintiffs' premises as City offices.

Mr. Charles Riley, cross-examined by Mr. Buckmaster, said he was an architect, and had had considerable experience in questions of light in the City of London. He had seen the plans prepared by the previous witness, and had checked the measurements and the angles of obstruction that the plans showed, and they were correct. It was fair, for the purpose of determining the obstruction that would be caused by the defendants' new buildings to the windows shown as "A" in area "C1," to take the section along the line which Mr. Smith had drawn. He had inspected the premises and gone into the rooms in areas "C1," "C2," and "C3." If defendants' new buildings were put up the light received in the windows in the first floor of "C1" would be considerably diminished. The windows in "C2" would be affected. "C3" did not stand in the same position as either "C1" or "C2." If the defendants' buildings were put up to the height they proposed, it would seriously affect the value of the plaintiffs' premises. The damage would be substantial.

Cross-examined by Mr. Neville, The light coming to the south side of "C1" was not so effective as the light coming to the north side of "C1," because, on the north side of "C1" there was a higher building of their own. He had only been in the plaintiffs' offices once, and that was a few days ago. It was at about two o'clock in the afternoon. That was on Friday, June 24. He went into the whole of the rooms on the first and second floors, but not on the ground floor. Those offices were fairly well lighted considering they looked into a well. "C3" had a good light undoubtedly.

Mr. Henry Dawson, an architect and surveyor, examined by Mr. Buckmaster, said that he had been informed of the fact that there was a party wall between the area "C1" and the defendants' premises, and the area "C2" and the defendants' premises, which originally stood at the height of 33 ft. He had formed his opinion on the question of the light on the assumption that that wall was still up.

Mr. Buckmaster: Let me take the area "C1." Assuming the party wall up, are there any windows that look into "C1" that will not be materially affected by the defendants' buildings?—None, nor in "C2" either. In answer to his lordship, the witness said that all the windows would be materially affected.

Examination continued, The letting value of the plaintiffs' premises on the ground and first floors would be materially and substantially affected by the defendants' proposed buildings. The second floor not so much. The windows "1" and "3" on the ground floor in "C3" would be materially affected by the defendants' buildings, but not the windows in the other floors of "C3."

Cross-examined by Mr. Neville, Do you say that the injury to the plaintiffs' buildings by the defendants' proposed buildings in "C1" would be greater on the ground floor than on the first floor of "A" and "B"?—Certainly not. It is greater on the first floor.

Further cross-examined, The second floor was affected less than the first floor. The deprivation of light to the ground and first floor windows of "C1" and "C2" by the defendants' new buildings would substantially affect their letting value. For all practical purposes the existence or non-existence of 23 ft. to the top of the wall might be disregarded.

Mr. John Alexander Potter, examined, said he was general manager of Shaw and Co.,

shipowners, who had offices in No. 34, Leadenhall-street. There principal offices were on the first floor, and they had also two rooms on the second floor, and another room on the third floor. Their offices looked into areas "C1" and "C2." The rooms on the first floor had been in the occupation of the Company for twenty years. During that time he had observed the light coming to the windows of the rooms on the first floor. He thought that if the defendants' buildings were put up, the light to their rooms would be very materially decreased. The defendants' building, as far as it had already gone, had diminished the light of their offices.

Cross-examined by Mr. Neville, His attention was first called to the question of light when the old building was taken down—about last September.

When was your attention first directed to any alteration of the light coming to your premises?—This spring.

Cross-examination continued, He considered that the obstruction that would be caused to the light of the window "A" by the defendants' new buildings would be appreciable. The obstruction might not be material in summer, but it would be material in winter. Before the defendants' buildings were pulled down the light they received through their windows was sufficient for the business they carried on.

Mr. W. M. Marshall, secretary of a ship-building company having offices on the first floor of No. 34, Leadenhall-street, examined, said that if the light of their offices was further diminished, the value of them would be decidedly affected. He was present when the defendants made experiments with tarpaulin, showing the height their building was intended to go. He noticed that the tarpaulin materially obstructed the light coming into the window "J." The tarpaulin was up for some weeks.

This being the plaintiffs' case, his lordship asked Mr. Buckmaster what relief the plaintiffs asked for.

Mr. Buckmaster replied that plaintiffs asked for an injunction to restrain further building by the defendants, and damages for the loss of light already suffered.

His lordship: Is that what you are going to ask now?

Mr. Buckmaster: Does your lordship mean, ask for an injunction to restrain further building?

His lordship: Quite. Mr. Buckmaster, after consulting with his clients, said that they would be prepared to let the case be dealt with on the footing that they asked only for damages for the wrongful act which was done by the defendants' buildings.

His lordship: Then the question is whether I ought to refer the case to a surveyor to ascertain the damages for the wrongful act, if there is any wrongful act.

Mr. Astbury, K.C., in the absence of Mr. Neville, said he should like to call a few witnesses to show that the defendants' building caused no interference with the light of plaintiffs' building at all. According to the view of defendants, they did not intend to put up a building which would cause any damage at all.

His lordship: You have to satisfy me that the plaintiffs make out no case of interference with light in the sense we use the term.

Mr. Astbury: We say we are not causing any obstruction which is calculable at all.

Professor Elsey Smith, examined by Mr. Astbury, said he was an architect, and was Professor of Architecture at King's College. He had devoted a considerable amount of attention in the past to questions of light. In the present case he had made a careful examination of the premises, and had considered the effect of the defendants' new buildings, if raised to the full height, on the plaintiffs' windows, with the partition wall both up and in its present condition. In "C1" and "C2," supposing the partition wall was up to the full height of 33 ft., the defendants' new building could not have any possible appreciable effect on the ground floor windows in those areas. He had been in the rooms on the first floor. Having regard to City offices in general, the rooms on the first floor of plaintiffs' premises enjoyed a particularly good light. If the defendants' building was put up to the full height, the effect on the plaintiffs' premises would be so small that it could not be put into money. Having regard to the place where the premises were situate, he had no doubt at all that defendants' new building would not cause any appreciable nuisance or render any of the plaintiffs' rooms less fitted for business.

Cross-examined by Mr. Buckmaster, Would the defendants' building not materially interfere with the light which "A" had

hitherto received from the south-west?—It would not materially interfere with the lighting of the room generally. It would not be material for the purposes for which the rooms are used.

Cross-examination continued, The windows "a," "h," "c," "d," and "e" in the plaintiffs' premises were so lighted that the defendants' new building would not materially interfere with the lighting of the rooms. There was no doubt that there would be a slight interference with the light of the windows on the ground, first, and second floors in the areas "C1" and "C2," with regard to the area "C3," the interference was very slight indeed.

Mr. H. H. Collins, an architect, and one of the District Surveyors for the City of London, generally corroborated the evidence of the last witness.

Mr. Douglas Young, surveyor, examined, said he had had a large experience in light and air cases. His opinion was that the depreciation in the light to the plaintiffs' buildings by reason of the defendants' proposed buildings would be so small that it would be impossible to find a money value for it.

Cross-examined, There would be an interference with the lateral light coming from the south-west, but it would not be substantial.

Counsel having addressed the court on behalf of their respective clients, Mr. Justice Buckley, in giving judgment, after stating the facts, said that the discussion before him had proceeded on the footing that defendants might require the party wall to be replaced to the full height, and that, therefore, the plaintiffs could not have any better right to complain of any interference than they would have had if that wall were replaced. The plaintiffs said that they had a right of action to restrain the defendants from erecting their building so as to obscure, darken, injure, or obstruct the ancient lights or windows of the premises looking over the areas "C1," "C2," and "C3." That the plaintiffs' lights were ancient was not denied. At the Bar the plaintiffs, at the close of their case, had intimated that they did not ask for an injunction but only for damages. The question on which he had to express an opinion was whether, on the evidence before him, he was satisfied that the plaintiffs had made out a case of damage such as could be complained of in a court of law to their ancient lights. If he thought they had not made out such a case, he must dismiss the action with costs, but if he came to the conclusion that they had made out a *prima facie* case, he would have to direct that there should be an inquiry as to damages.

The question of fact he had to decide, having regard to the recent decision of the House of Lords in the case of the Home and Colonial Stores v. Colls, was, whether the defendants' operations would deprive the plaintiffs of sufficient light which, according to the ordinary notions of mankind, taking into consideration the neighbourhood in which the plaintiffs' premises were situate, would render them less suitable as City offices? Assuming that the party wall was replaced at "C1" and "C2," it was obvious that all the plaintiffs' lights would lie in a well. The ground floor windows would be at a very considerable depth, and the first floor windows as well. In that state of things the plaintiffs said that the windows most interfered with were the windows on the first floor. The result of the evidence was that these windows, being in offices in a very congested part of the City, in which, of course, a very high amount of light was very frequently not enjoyed, were exceptionally well lighted. It was true that there was a considerable amount of light which found its way into the wells from the east. From the south to such of the windows as looked south there was an excellent light as a City light. The windows looking north enjoyed excellent light from diffused and reflected light. They also enjoyed light from the west. These rooms enjoyed, as City offices, an excellent amount of light. He thought that the obstruction complained of would not so interfere with the light of the plaintiffs' rooms as that they could not be occupied as City Offices. That being so, there was cause of action. He negatived the suggestion that there was an actionable nuisance shown. He thought it was quite plain that there was no pecuniary damage at all which would result from that which the defendants proposed to do. The deprivation of a small amount of light was no nuisance to the plaintiffs. A little less light would do the plaintiffs no harm. That being so, there was no nuisance. The plaintiffs, having failed to prove some ground of damage, the action failed, and he dismissed it with costs.

Order accordingly.

DOVER ANCIENT LIGHT CASE.

In the Court of Appeal, composed of Lords Justices Vaughan Williams, Romer, and Cozens-Hardy on the 4th inst., the bearing was concluded of the case of Thompson and Son, Ltd., v. Lloyd's Bank, Ltd., on the defendants' appeal from the judgment of Mr. Justice Joyce in the Chancery Division. (The case was reported in the issue of the *Builder* of November 14, 1903.)

In this case the plaintiffs, the owners of the Garrick's Head, Market-square, Dover, claimed an injunction to restrain the defendants, the owners of Nos. 6 and 7, Market-square, from erecting, or permitting to remain erected, any building on the site of their premises in such a manner as to interrupt the free access of light to plaintiffs' windows as the same had been hitherto enjoyed, and for damages. It appeared that the premises of the plaintiffs and defendants adjoin, and part of the plaintiffs' premises consist of an open passage, and a tap-room alongside it, which are on the ground floor, and of rooms above. The rooms were used for the purpose of the plaintiffs' business. The windows of these rooms abut on an open yard, which is part of the defendants' premises. The highest part of the old buildings of defendants did not exceed 34 ft. from the ground level. The plaintiffs alleged that their lights were ancient, and they had enjoyed the free access of lateral light to the windows of these rooms over the defendants' buildings. The plaintiffs alleged that defendants intended to pull down these buildings and erect on the site new buildings to a height of 60 ft., which would materially obstruct their light.

Defendants, in their defence, said that no part of their proposed new buildings, which could in any way affect the access of light to the plaintiffs' windows, was to be as high as 60 ft. The proposed main back wall was to be only 31 ft. 6 in. high above the ground level, and was to be 3 ft. further south and away from the plaintiffs' windows than the old back wall. Defendants also said that the ridge of the roof was to rise to a height of 49 ft., but would be so sloped and set back from the main wall at the eaves so as not to interfere with the access of light to plaintiffs' windows. They also said that the only part of the buildings which was to approach a height of 60 ft. was a small turret at the south-eastern corner, which could not have any effect on the access of light to the windows. Defendants further said that, if there was any obstruction, it would be lateral obstruction of an insignificant and immaterial character, and not such as to cause any appreciable damage to the plaintiffs. Mr. Justice Joyce held that the defendants' building would obstruct some of the plaintiffs' ancient lights, and that the interference would not be trivial. He accordingly granted an injunction in the Yates and Jack form, and awarded the plaintiffs the costs of the action. Hence the present appeal of the defendants.

Mr. Younger, K.C., and Mr. Sargent appeared for the appellants, and Mr. Hughes, K.C., and Mr. McSwiney for the respondents. Mr. Younger, on behalf of the appellants, having stated the facts, said the question the court had to determine was, would the light from the defendants' new building amount to a nuisance to the plaintiffs? His submission was that, having regard to the decision of the House of Lords in the case of the "Home and Colonial Stores v. Colls," it did not amount to a nuisance. He argued, first, that the plaintiffs had not shown a good cause of action. If, however, the court should hold that the plaintiffs had a good cause of action, his submission was that they had no right to an injunction, but only the right to recover damages if the building were erected.

Mr. Hughes, on behalf of the respondents, submitted that the judgment of Mr. Justice Joyce should not be disturbed. He contended that the decision of the House of Lords in the case of the "Home and Colonial Stores v. Colls" did not apply to the present case. The decision of the House of Lords in that case was, in effect, that a plaintiff, though losing a substantial part of his light, had no right of action if he had a sufficiency of light for the purposes of business or occupancy. He did not think that the decision in that case went further than that. If he was right in suggesting in that case that decision could have no application to a case where you started with an insufficiency of light. In the present case it was the fact, and it was really conceded that the plaintiffs had an insufficiency of light. The tenant and all the plaintiffs' witnesses said that the light was insufficient, and that, on a dark day, artificial light had to be used. He submitted that the plaintiffs had the right to keep the little light they had. Plaintiffs were bound to get their light from the narrow yard which was now the property

of the defendants. The only possibility that the plaintiffs had of getting light was from that narrow yard. He contended that the plaintiffs had shown that they would suffer substantial damage to their light if the defendants' building were erected, and that they were entitled to the injunction granted by Mr. Justice Joyce. The learned counsel argued that, at any rate, the plaintiffs would be entitled to damages.

Lord Justice Romer pointed out that the plaintiffs could not get an order for damages as the defendants' building had not yet been erected, and might never be erected.

Mr. McSwiney followed on the same side.

In the result, Lord Justice Vaughan Williams, in giving judgment, said he should have liked to have disposed of this case on proper materials on which to work; but as neither party had accepted the suggestion for an independent surveyor to make a report to the court on the matter in dispute, all that he and his learned brothers could do was to decide the case on such materials as were placed before them. Mr. Justice Joyce had tried the case before the decision of the House of Lords in the case of the "Home and Colonial Stores v. Colls" was heard in the House of Lords, and, at that time, the learned judge had regard to the law as it was declared by the Court of Appeal in the case of the "Home and Colonial Stores v. Colls." The decision of the Court of Appeal in that case was really given on the basis that a right to light was a right of property, which, if substantially violated, entitled the person whose right had been thus violated to an injunction. That being, as Mr. Justice Joyce understood, the proper question to be inquired into at the time, the present case was tried on that basis. But they now knew that, according to the decision of the House of Lords, that the real question to be asked was, whether the effect of the defendants' building was to diminish the light and air so as to sensibly affect the occupation of the plaintiffs' premises and make them unfit for occupation. At the time the Court of Appeal gave its decision in the case of the "Home and Colonial Stores v. Colls," it was thought that anything beyond a mere trifling interference with the right to light entitled the plaintiff to succeed in an action, and to get an injunction. Mr. Justice Joyce had come to the conclusion that the sort of well from which the plaintiffs' windows got their light would be very much darker after the defendants' buildings were erected than it was now, and that there would be obstruction to the direct sunlight to the plaintiffs' windows during a part of the day. Mr. Justice Joyce went on to say that the damage would not be trivial, and would be of such a character as to justify the court in granting an injunction. He (the Lord Justice) would have thought that the most convenient course, as far as that court was concerned, was to have got an independent surveyor to have given them his views on the question, because, upon the general finding of Mr. Justice Joyce, it was impossible to say that there was such a diminution of light and air as sensibly to affect the occupation of the plaintiffs' premises, and make them less fit for occupation. For that reason he should have preferred to have the assistance of a report from an independent surveyor upon that very question. With such material as this court had, he was not satisfied that the plaintiffs had made out such a case as to entitle them to an injunction. Having regard to the conditions under which the inquiry was held, it was difficult to arrive at any conclusion at all. But, being invited by the parties to look at such parts of the case as were relevant to the issue, he was not prepared to say that the plaintiffs had made out their case. He was anxious that it should be known that he did not intend anything he had said to affect this *quia timet* kind of action, or which would entitle the defendants to say that the Court of Appeal sanctioned their building being erected. If the defendants went on with their building they went on at their own risk. In these circumstances the action must be dismissed, and the appeal succeed, with the usual consequences.

Lord Justice Romer also thought that the appeal should be allowed. He could not help thinking that the expert witnesses in the court below, and the learned judge in his findings of fact were almost of necessity influenced by the judgment of the Court of Appeal on the question of light in the case of the "Home and Colonial Stores v. Colls" before that case went to the House of Lords, and was decided there. The action was a *quia timet* action, and the onus was on the plaintiffs to prove that the proposed new buildings of the defendants would be a wrongful act on the part of the defendants such as to justify this court in granting them an injunction.

Lord Justice Cozens-Hardy also concurred.

He wished, however, to point out that the fact that the appeal had been allowed, would not prevent the plaintiffs bringing a fresh action, if they were so minded, for any damage caused by the defendants' proposed buildings.

The appeal was accordingly allowed with costs, the plaintiffs' action being dismissed with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

4,819 of 1903.—J. BLANC: *Reinforced Concrete Construction.*

A system of construction for transoms, flags, slabs, floors, ceilings, joists, beams, columns, etc., in reinforced concrete, characterised by the construction of a skeleton or frame, formed of metallic trellis work of longitudinal rods or bars, connected by rods or bars which before and after having entwined the said rods or bars pass into the floor, ceiling, etc., thus establishing an intimate connexion.

13,453 of 1903.—J. SALT: *Window Sashes and Stiles, and a Device for Fixing and Hanging same.*

Window sashes and stiles, and means for hanging said sashes, consisting in the combination of grooves within the pulley stiles, conductors bearing in said grooves, and pivots bearing in said conductors, and carried in the sash stiles.

17,216 of 1903.—C. PHILIP and H. MAURER: *Rising Door Hinges and Door Checks.*

An automatically closing rising door hinge and check, comprising helically threaded pin, having at its lower end a brake piston extending into an oil receptacle or air chamber, and provided with a valve which enlarges the passage for the brake fluid during the upward movement of the pin, and reduces the said passage during the downward movement of the pin, in order to allow of rapid opening of the door and to cause the latter to close slowly.

21,322 of 1903.—T. B. HARRISON: *A Lifting or Hoisting Apparatus.*

A lifting apparatus, in which is employed a device consisting of a pulley block suspended by the hoisting rope of the lifting or hoisting apparatus, a carrying block with pulleys respectively on fixed and movable pins or axles, a rope having its two ends attached to a fixed part of the lifting or hoisting apparatus, and passed round pulleys of the said pulley block and carrying block, gripping pieces carried from said movable axles or pins, and fulcrumed to a common centre or to different centres on a distance bar.

1,742 of 1904.—J. PILKINGTON, L. PILKINGTON, and H. PILKINGTON: *Ventilating Appliances for Windows.*

The invention consists of a folding flap fixed to the bottom sash of the window, so that when the latter is raised the space can be closed, and the window fixed or locked in this position, and the fresh air can enter only between the upper and lower windows or sashes.

8,656 of 1904.—J. EBRINGHAM: *Construction of Flues and of Bricks therefor.*

This invention relates to the construction of flues for smoke, air, gas, and the like, and consists in forming said flues of specially-shaped bricks, constructed to firmly bind or bond the back and front of the flues together, and is particularly adapted to the bends in flues. The bricks are usually made of the thickness of two ordinary bricks, but may be made of the thickness of one ordinary brick if preferred.

9,200 of 1904.—A. WYSS-BAUMGARTNER: *Chimney Tops.*

A chimney top, comprising a spiral, decreasing in the sense of the height, and whose different spirals form, with the increasing height, acute angles with the centre line of greater and greater magnitude, with the object of obtaining a brisker suction action on the chimney.

10,296 of 1904.—J. D. BENNET: *Folding Desks for School and other use.*

A folding desk in which brackets carrying the swinging desk top are pivoted to the end standards, and their swinging movement is limited by stops on such brackets entered into segmental guide ways in the standards.

10,321 of 1904.—J. A. TAYLOR: *Sash Fastenings.*

The object of this invention is to combine convenience with security, by providing means whereby window sashes may be partially open and yet remain securely locked together. To

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

effect this, one end of the top rail of the bottom sash is fitted with a sash fastener, having a spring arm furnished with a projecting stud that takes into, and works up and down in a slotted check-plate, which is counter sunk in one side of the upper sash in any convenient position.

16,859 of 1903.—W. MARCH: An Appliance for Breaking up Macadam and other Roads.

A road-lifting machine, the wedges of which horizontally pierce and lift up the road surface, whether through the medium of screws or gearing, or whether constructed with lever, sliding bars, links, fixed or detached blades, steel rope, and winding gear.

17,269 of 1903.—J. W. SUTTON: Non-Conducting Walls, suitable for Ice Safes, and the like.

According to this invention the wood or other material of which the wall is formed has cemented to it a layer of compressed cork, which is preferably comparatively thick, say half an inch, and this in turn has cemented to it a sheet of mineralite. The surface of the mineralite is enamelled with any suitable enamel, which, however, should not contain any lead or other poisonous material.

17,619 of 1903.—J. SHANKS and R. BURNSIDE: Ball Taps or Float Valves.

A ball tap or float valve, comprising a barrel having a part shaped to take the connexion with the supply pipe, the inner end of which part forms the seating for a valve on a piston working in the barrel, the piston having in it a ball head on the end of a float lever, fulcrumed on a rocking ball pin projecting through the barrel.

18,583 of 1903.—A. COLLIS: Flushing Cisterns. This consists in the combination with a flushing cistern of a perforated inlet pipe, and a closed discharge chamber divided into two compartments communicating with each other, and fitted with a flap valve, discharge pipe, and air pipe, and with a plunger and pull.

6,828 of 1904.—D. D. McBEAN: A Method and Means for Constructing Subaqueous Tunnels, or the like.

A subaqueous building construction, consisting in the combination of a submerged working chamber, comprising sheeting walls driven into the earth beneath, and a roof seated upon the same, and means for supplying air under pressure to said chamber, to transmit the pressure of the superincumbent water to the side walls and bottom of said chamber.

9,945 of 1904.—F. J. M. M. DUCASTEL: A Method of Making Foundations in Compressible Loose, or Water-logged Ground.

A method of making foundations in wet ground (muddy, peaty, marshy, compressible, immersed, or water-logged), consisting in the first place, if found necessary, in the formation of a platform or artificial island, and then in the insertion and compression in this platform of impervious sheaths built up of hardened clay intended to completely surround the foundations or piles, enabling them to be mainly supported on the solid ground and anchored therein, the materials constituting these foundations being rammed, or pile driven in the interior of the said projecting sheaths with or without an armature or strengthening piece of metal.

10,556 of 1904.—J. AHNOLD JUN.: Sewers.

The construction of sewers, consisting in the combination of slabs, blocks, or plates suitably curved or shaped to form, when fitted together, the sides or body of the sewer, an invert upon which the said body is built or rests, and an outer lining of brickwork surrounding the body thus formed.

SOME RECENT SALES OF PROPERTY:

Table listing property sales including Estate Exchange Report, Bromley, Kent, Hitoham, Suffolk, Framlingham, Suffolk, Manston, Isle of Thanet, etc.

June 27.—By THOMAS SHARP.

Table listing property sales including Canning Town, Queen's-rd., a freehold building estate, East Ham, 341 to 349 (odd), Barking-rd. (s.), f., w.r. 1951, etc.

By FRANCIS DOD & Co.

Table listing property sales including Stoke Newington, 1, St. Kilda's-rd. ("Manor Nursery"), area 2 of an acre, u.t. 79 1/2 yrs., g.r. 12 1/2, y.r. 45 1/2, etc.

By JENKINS & SONS.

Table listing property sales including Lewisham, 37, Halesworth-rd., u.t. 72 yrs., g.r. 7 1/2, 108, p., etc.

By MAPER & Co.

Table listing property sales including St. John's Wood, 51, Springfield-rd., u.t. 33 yrs., g.r. 8 1/2, 88, p., etc.

By WILLOUGHBY & Co.

Table listing property sales including Streatham, 18, Mount Ephraim-rd., u.t. 50 yrs., g.r. 12, 108, 6d., y.r. 100 1/2, etc.

By ROGERS BROS. (at Peckham).

Table listing property sales including Peckham, 8, 11, and 13, Lanvanor-rd., u.t. 72 1/2 yrs., g.r. 15 1/2, w.r. 117 1/2, etc.

June 28.—By DEBENHAM, TEWSON, & Co.

Table listing property sales including Holborn, 34 and 35, Hatton-gdn., with warehouse in rear, area 4,500 ft., y.r. 519 1/2, also 42, r. 100, revenue in 64 yrs., etc.

By CRURCH & HOOPER.

Table listing property sales including East Grinstead, Sussex, West Hoathly-rd., a freehold corner building plot, etc.

By C. W. DAVIES & SON.

Table listing property sales including Caledonian-road, 22, Havelock-st., u.t. 51 yrs., g.r. 6 1/2, y.r. 36 1/2, etc.

By ALFRED RICHARDS.

Table listing property sales including Tottenham, Stamford-terr., etc., f.g. rents 128 1/2 lbs. Sussex, West Hoathly-rd., a freehold corner building plot, etc.

CONTRACTIONS USED IN THESE RATES.—F.g. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; br. for terrace; cres. for crescent; av. for avenue; gns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

TO CORRESPONDENTS.

H. L.—N. H. D.—R. M.—G. W. (Below our limit).—G. G. B. (Amount should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, manuscripts, or other documents, sent or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

Architectural Association.—All Day Visit to Winchester. The Junior Institution of Engineers.—Excursion to Dover. Visit to the South-Eastern and Chatham Railway turbine steamer "The Queen." The Admiralty Harbour Works, and the Works of the Dover Harbour Board. Reception by the Mayor and Mayoress at the Town Hall in the afternoon. Train leaves Victoria at 9.55 a.m.

MONDAY, JULY 11. Institute of Sanitary Engineers, Ltd.—Organising Committee, 3 p.m. Examination and Literary Committee, 5 p.m.

WEDNESDAY, JULY 13. Builders' Benevolent Institution.—Annual General Meeting, 3 p.m. Committee Meeting, 3.30 p.m.

THURSDAY, JULY 14. Incorporated Association of Municipal and County Engineers.—Thirty-first Annual General Meeting, at Shrewsbury.

FRIDAY, JULY 15. Incorporated Association of Municipal and County Engineers.—Thirty-first Annual General Meeting, at Shrewsbury (continued).

SATURDAY, JULY 16. Incorporated Association of Municipal and County Engineers.—Thirty-first Annual General Meeting (concluded). Institute of Sanitary Engineers.—Visit to Tunbridge Wells.

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing prices for Bricks, Glazed Bricks, Hard Stocks, Facing Stocks, Shippers, Best Bed Pressed, Fire Bricks, etc.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Gray Stone Lime, 12s. 0d. per yard, delivered. Stourbridge Fireclay in sacks 27s. 6d. per ton at ry. dpt.

STONE.

Table listing stone prices including Bath Stone, Portland Stone, Ancaster in blocks, Beer, Greenshill, Darley Dale, Red Corshill, Closeburned Freestone, Red Mansfield, etc.

YORK STONE.—Robin Hood Quality.

Table listing York Stone prices including Scappled random blocks, 6 in. sawn two sides, 6 in. rubbed two sides, etc.

STONE.—(continued).

HARR YORK—	s. d.
Scrapped random blocks	3 0 per ft. cube, deld. rly. depot
6 in. sawn two sides	landings to sizes
(under 40 ft. super.)	2 8 per ft. super. "
6 in. rubbed two sides	ditto
3 in. sawn two sides	3 0 " " "
(slabs random sizes) 1 2	" " "
2 in. self-faced random	flags
16 x 8	0 5
Hopton Wood (Hard Bed)	in blocks 2 3 per ft. cube, deld. rly. depot
" " "	6 in. sawn both sides landings 2 7 per ft. super. deld. rly. depot
" " "	3 in. do. 1 2 " " "

SLATES.

m. in.	£ s. d.
20 x 10 best blue Bangor	13 2 6 per 1000 of 1200 at r. d.
20 x 12 "	" 13 7 6 "
20 x 10 first quality "	" 13 0 0 "
20 x 12 "	" 13 15 0 "
16 x 8 "	" 7 5 0 "
20 x 10 best blue Port-madoc	12 12 6 "
20 x 10 best Buckenun-fading green	15 17 6 "
20 x 12 "	" 18 7 6 "
18 x 10 "	" 13 5 0 "
16 x 8 "	" 10 3 0 "
20 x 10 permanent green	11 12 6 "
18 x 10 "	" 12 6 6 "
16 x 8 "	" 6 12 6 "

TILES.

Best plain red roofing tiles	42 0 per 1000 at rly. depot.
Hip and Valley tiles	3 7 per doz. "
Best Broseley tiles	50 0 per 1000 "
Do. Ornamental tiles	52 6 " " "
Hip and Valley tiles	4 0 per doz. "
Best Ruanon red, brown, or brindled do. (Edwards)	57 6 per 1000 "
Do. Ornamental do.	4 0 per doz. "
Hip tiles	3 0 " " "
Valley tiles	3 0 " " "
Best Red or Mottled Staffordshire do. (Peaches)	51 9 per 1000 "
Do. Ornamental do.	54 6 " " "
Hip tiles	4 1 per doz. "
Valley tiles	3 8 " " "
Best " Rosemary plain tiles	43 0 per 1000 "
Best Ornamental tiles	50 0 " " "
Hip tiles	4 0 per doz. "
Valley tiles	3 8 " " "
Best " Harshill plain tiles, sand faced.	50 0 per 1000 "
Do. pressed.	47 6 " " "
Do. Ornamental do.	50 0 " " "
Hip tiles	4 0 per doz. "
Valley tiles	3 6 " " "

WOOD.—At per standard.

Deals: best 3 in. by 11 in. and 4 in.	£ s. d.	£ s. d.
by 9 in. and 11 in.	15 10 0	16 10 0
Deals: best 3 in. by 11 in.	14 10 0	15 10 0
Battens: best 2 1/2 in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2 1/2 by 6 and 3 by 6.	1 0 0	less than 7 in. and 8 in.
Deals: seconds	10 0	less than best
Battens: seconds	9 0	" " "
2 in. by 4 in. and 2 in. by 5 in.	9 0	9 10 0
2 in. by 4 in. and 2 in. by 5 in.	8 10 0	9 10 0

Foreign Sawm Boards—

1 in. and 1 1/2 in. by 7 in.	0 10 0	more than battens.
3 in.	1 0 0	
At per load of 50 ft.		
Fir timber: best middling Danish or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	0 15 0	0 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOISTS, GIRDERS, &c.

Rollod Steel Joists, ordinary sections	£ s. d.	£ s. d.
Compound Girders, ordinary sections	8 2 6	9 5 0
Angles, T-sections and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns.	7 2 6	8 5 6

WOOD.—(con'tinued)—At per standard.

Wainscot Oak Logs, per ft. cube	£ s. d.	£ s. d.
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
3 in. do. do.	0 0 6	0 0 7
Dry Mahogany—Hondas, Tausco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 10 0	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks, per ft. cube	0 4 0	—
Prepared Floorings—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1 1/2 in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1 1/2 in. by 7 in. white, planed and matched	0 15 0	0 16 6
3 in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. white, planed and shot	0 10 0	0 11 6
3 in. by 7 in. white do. do.	0 11 0	0 11 6
1 in. by 7 in. do. do. do.	0 10 6	0 13 6
6 in. at 6d. to 8d. per square less than 7 in.		

IRON.—Per ton, in London.

Common Bars	£ s. d.	£ s. d.
Staffordshire Crown Bars, good merchant quality	7 15 0	8 5 0
Staffordshire "Marked Bars"	16 0 0	0 0 0
Mild Steel Bars	8 15 0	9 5 0
Hoop Iron, basis price	9 5 0	9 10 0
" Galvanized	17 10 0	—
Sheet Iron, Black—		
Ordinary sizes to 20 g.	9 15 0	—
" 24 g.	10 15 0	—
" 28 g.	11 5 0	—
Sheet Iron, Galvanized, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	13 15 0	—
Ordinary sizes to 22 g. and 24 g.	14 5 0	—
" 26 g.	14 5 0	—
Sheet Iron, Galvanized, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0	—
" 22 g.	16 0 0	—
" 24 g.	18 0 0	—
Galvanized Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0	—
" 22 g.	13 0 0	—
" 24 g.	13 15 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0	—
Best Soft Steel Sheets, 32 x 24 g.	12 15 0	—
" 22 g.	14 0 0	—
Cut nails, 3 in. to 6 in.	9 0 0	9 10 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

Lead—Sheet, English, 3 lb. and up	£ s. d.	£ s. d.
Pipe in coils	14 5 0	—
Soil pipe	17 5 0	—
Compo pipe	17 5 0	—
Zinc—Sheet—		
Vielle Montagne	27 0 0	—
Silesian	26 15 0	—
COPPER—		
Strong Sheet	0 10 1/2	—
Thin	0 11 1/2	—
Copper nails	0 11 1/2	—
BRASS—		
Strong Sheet	0 0 10	—
Thin	0 0 11	—
Tin—English Ingots	0 1 3 1/2	—
SOLDER—Plumbers'	0 0 6 1/2	—
Timmen's	0 0 8	—
Blowpipe	0 0 9	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	23d.	per ft. delivered.
" fourths	15d.	" "
21 oz. thirds	34d.	" "
" fourths	24d.	" "
26 oz. thirds	41d.	" "
" fourths	34d.	" "
32 oz. thirds	51d.	" "
" fourths	41d.	" "
Fitted Sheet, 15 oz.	33d.	" "
" 21 oz.	41d.	" "
Hartley's Rolled Plate	18d.	" "
" "	16d.	" "
" "	24d.	" "

OILS, &c.

Raw Linseed Oil in pipes	Per gallon	£ s. d.
" " in barrels	0 1 7	—
Bolled " " in pipes	0 1 9	—
" " in barrels	0 1 8	—
Turpetine, in drums	0 2 0	—
" " in barrels	0 3 6	—
Genuine Ground English White Lead	per ton	18 15 0
Red Lead, Dry	"	18 10 0
Best Linseed Oil Putty	per cwt.	0 12 0
Stockholm Tar	per barrel	1 6 0

VARNISHES, &c. Per gallon.

Fine Pale Oak Varnish	£ s. d.	Per gallon.
Pale Copal Oil	0 8 0	—
Superfine Pale Elastic Oil	0 15 0	—
Fine Extra Hard Churex Oak	0 10 0	—
Superfine Hard-drying Oak, for seats of Churches	0 14 0	—
Fine Elastic Carriage	0 12 6	—
Superfine Pale Elastic Carriage	0 16 0	—
Fine Pale Maple	0 16 0	—
Finest Pale Durable Copal	0 15 0	—
Extra Pale French Oil	1 1 0	—
Eggshell Flattening Varnish	0 13 0	—
White Copal Enamel	1 4 0	—
Extra Pale Paper	0 12 0	—
Best Japan Gold Size	0 10 6	—
Best Black Japan	0 16 0	—
Oak and Mahogany Stain	0 9 0	—
Brunswick Black	0 8 6	—
Berlin Black	0 16 0	—
Knottin	0 10 0	—
French and Brush Polish	0 10 0	—

TERMS OF SUBSCRIPTION.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursday. [N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under 100l. unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

BARNESLEY.—For road works, Grafton-street and Junction-street, for the Town Council. Mr. J. H. Taylor, Borough Surveyor, Manor House, Barnsley:—

Junction-street.
J. Hood, Peck-street, Barnsley £414 17 8

Grafton-street.
G. H. Burrows, Park-road, Barnsley 503 2 3

BELFAST.—For heating May-street Church:—
W. Willis, Belfast £100

BIGGLESWADE.—For additions to the Isolation Hospital, Biggleswaide, Beds., for the Joint Hospital Board. Mr. Henry Young, architect and surveyor, Bedford:—

Saint	£5,298 0 0	Batemans	—
Wade	5,177 0 0	Son	£4,603 0 0
Banard	5,050 0 0	Parsons & Son	4,575 14 0
Hinson & Co.	4,850 0 0	Balby	4,427 0 0
Hockley & Co.	4,860 0 0	Eastwood	4,300 0 0
French	4,838 0 0	Warton	4,298 0 0
Foster	4,837 0 0	Dunstall	4,220 0 0
Bell & Son	4,831 0 0	C. A. Hayes	207 0 0
Raban & Son	4,783 0 0	H. o w a r d	—
Wright	4,689 0 0	Huntingdon	4,000 0 0
Redhouse	4,625 0 0	—	—

BRISTOL.—For erecting warehouse at Lawrence Hill Railway Wharf, for Messrs. T. Adams & Bros. Mr. W. H. Watkins, architect, 15, Clare-street, Bristol:—

T. R. Lewis	£250 0 0	O. Humphreys	£209 10 0
E. Love	222 4 0	C. A. Hayes	207 0 0
H. W. & E. L. Neale	222 0 0	A. J. Beaven	196 0 0
		Bedminster	196 0 0

CONISBOROUGH.—For six miles of 14-in. east-water pipes for the Doncaster Corporation. Mr. W. H. Crabtree, C.E., Mansion House, Doncaster:—

Stanton Ironworks Co., Ltd., nr. Nottingham * £6,063

DARTFORD.—For the construction of Westgate and Junction roads, for the Urban District Council. Mr. T. E. Triffin, A.M.I.C.E., Surveyor to the Council:—

S. J. Bice & Sons, Point Barge Wharf, Rochester £1,579 7 6

DONCASTER.—For rebuilding a bridge over the Dutch river, for the Corporation. Mr. Crabtree, C.E., Borough Surveyor, Doncaster. Quantities by Surveyor:—

F. Glyphen	£1,855 2 3	Leggett	0 1 6
H. Conell	1,734 17 7	Speight	£1,506 19 15
T. W. Peddette	1,678 14 4	T. C. Starkey	1,449 18 6
P. Sangwin	1,877 8 10	Sheffield & W. Bentley	1,631 1 0
W. Bentley	1,631 1 0	South Yorkshire Navigation Co., Sheffield	1,400 0 0
Harman & Wagon	1,600 0 0		

DOVER.—For additions to Corporation Electricity Works, for the Corporation. Mr. L. W. Woodman, M.I.E.E., Borough Electrical Engineer, Park-street, Dover. Quantities by Mr. W. Beaton, Dover:—

O. Capell	£2,221 8 6	S. Lewis	£1,312 0 0
Gann & Co.	1,650 0 0	Hayward	—
G. Munro	1,428 11 9	Parsons	1,265 12 0
G. Browning	1,367 0 0	R. & G. Brisley	1,253 0 0
O. Keeler	1,325 0 0	G. Lewis & F. G. Minter	1,222 10 0
		Sons, Dover	—

DUNDEE.—For additions to tramway depot, Loches-road, for the Town Council. Mr. Jas. Thomson, City Architect, Dundee. Quantities by City Architect:—
Builder: J. Allan, Dundee £308 0 0
Joiners: J. Scott & Sons, Dundee 218 0 0
Iron: Beath & Keay, Dundee 56 9 10
Painters: Petrie & Sons, Dundee 22 18 9
Slater: C. Brand, Dundee 41 7 7
Plumber: W. Feawick, Dundee 33 19 0

GAINSBOROUGH.—For erecting a public library, for the Urban District Council. Messrs. Scorer & Gamble, architects, Bank-street-chambers, Lincoln:—
 A. J. Bimes .. £3,782 7 4 F. M. Thompson .. £3,402 0 0
 W. Scott .. 3,779 0 0 T. Cuthbert .. 3,435 0 0
 C. J. M. Greenwood .. 3,995 0 0 H. S. & W. Close .. 3,400 0 0
 J. H. Vickers 3,592 0 0 S. & R. Horton 3,582 0 0 C. Sprakes & D. Gill & Son 3,527 0 0 Son, Doncaster* .. 3,156 0 0
 Mawer Bros. 3,482 19 4

GODALMING.—For new surface-water drain and footpath, Brighton-road, for the Town Council. Mr. J. H. Norris, Borough Surveyor, Godalming. Quantities by the Surveyor:—
 Cunningham, Forbes, & Co., Fleet £236

HAMPTON.—For erecting Hampton Police Station. Mr. J. Dixon Butler, Surveyor to the Metropolitan Police, New Scotland Yard, architect. Quantities by Messrs. Thurgood, Son, & Childsey, Charing Cross-chambers, Duke-street, Adelphi:—
 A. Jordan .. £9,659 15 0 Higgs & Hill 383 283 0 0
 H. B. Row .. 8,490 0 0 Messom .. 8,077 0 0
 Grover & Son 8,412 0 0 Potterton .. 8,010 10 6
 Chessum & Sons .. 8,268 0 0 Collinson .. 7,500 0 0

HANDSWORTH.—For unclimbable wrought-iron fencing at electric light and power station sites, Piers-road, for the Urban District Council. Mr. H. Richardson, Engineer and Surveyor, Council House, Handsworth:—
 Dudley Art .. £254 8 4 Bavliss, Jones, & Baylis .. £177 10 0
 Hill & Smith .. 233 14 2 J. Elwell, Sherborna-street, Birmingham* 142 10 0
 H. A. Ward & Sons, Ltd. .. 186 7 6

HIGH WYCOMBE.—For New House, Amersham-hill, High Wycombe, for Mr. Daniel Clarke, J.P. Mr. Arthur Vernon, F.S.I., architect, 9, Strand, Charing Cross, London, W.C., and High Wycombe, Bucks:—
 G. Darlington £1,500 0 0 Y. J. Lovell .. £1,385 0 0
 Carter & Son .. 1,488 0 0 J. T. Harris .. 1,329 0 0
 H. Harris .. 1,475 0 0 G. E. Gibson .. 1,312 0 0
 G. Biggs & Son 1,450 0 0 Hunt & Son .. 1,291 0 0
 Nash & Sons .. 1,397 0 0 G. Smith .. 1,234 5 6
 Webster & Cannon .. 1,388 0 0 combe* .. 1,173 0 0

KINGSWINFORD.—For sewerage works (Contract No. 5; twenty-eight miles of pipes), for the Rural District Council. Mr. W. Fiddian, F.S.I., Engineer, Old Bank Offices, Stourbridge:—
 Twenty-three tenders, for £11,962 16s. 4d. downwards, were received. G. Skay & Co., Tamworth, at £5,707 2s. 7d. (provisionally accepted).

KINGSWINFORD.—For sewerage works (Contract No. 3; construction of brick cast-iron, and stoneware pipe sewers, manholes, lamp-holes, flushing chambers, and other works in connexion therewith), for the Rural District Council. Mr. W. Fiddian, F.S.I., Engineer, Old Bank-chambers, Engineer, Stourbridge:—
 Seven tenders, for £56,145 6s. 7d. downwards, were received. J. G. H. Guest & Son, Brettell Lane, 236, 744 provisionally accepted.

KINGSWINFORD.—For sewerage works (Contract No. 4; pumping plant at Wordsley Ashwood sewage pumping stations), for the Rural District Council. Mr. W. Fiddian, F.S.I., Engineer, Stourbridge:—
 Thirty-seven tenders, for £3,265 downwards, were received for gas engines and pumps, and twenty-five tenders, for £2,274 downwards, for electric motors and pumps. Campbell Gas Engine Co., Halifax, £1,780 (provisionally accepted for gas engines and pumps).

KINGSWINFORD.—For sewerage works (Contract No. 7; two workmen's cottages at Wordsley and Ashwood sewage pumping stations), for the Rural District Council. Mr. W. Fiddian, F.S.I., Engineer, Stourbridge:—
 Eleven tenders, for £1,120 downwards, were received. A. H. Guest, Coalbournbrook, near Stourbridge* £696.

LEATHERHEAD.—For the erection and completion of a new club-house, for the Surrey Golf Club, Puchaban Park, Leatherhead. Messrs. Thor & Trehearne, 45, Lincoln's-inn-fields, architects:—
 Brown & Son £2,842 0 0 E. H. Wallis & Co. .. £2,299 0 0
 L. Whitehead .. 2,725 0 0 Cropley & Sayers .. 2,473 0 0
 Jaquest .. 2,473 0 0
 J. De'Ath .. 2,415 0 0

LLANBEDR (Breconshire).—For erecting a parsonage house at Llanbedr, near Cricheknoll, for the Rev. W. Lloyd-Harris, F. B. Baker, architect, Llangavenny. Quantities by the architect:—
 T. S. Foster .. £2,639 R. Meredith, Newport .. £1,934
 J. G. Thomas & Sons 2,498 *Bridges-on-Wye* £1,934

LOUTH (Lincs.).—For erecting new board room and offices at the Workhouse, for the Guardians. Mr. E. C. Bentley, architect, 20, Corn-market, Louth:—
 M. Hatcliffe .. £523 0 0 H. Thompson & Mawer Bros. .. 510 14
 G. H. Vickers .. 494 7

LOCHMABEN (Dumfriesshire).—For sewerage and sewage disposal works, for the Town Council. Messrs. D. Balfour & Son, engineers, 3, St. Nicholas-buildings, Newcastle-on-Tyne:—
 W. Tilburn & Co., Craigelvin, Dumfriesshire* £2,028 17 10

LONDON.—For the execution of sewer and drain works, for the Westminster City Council:—

	Bond-street (Contract No. 55).			Park-lane, Regent-street, and Trafalgar-square (Contract No. 57).			Total.		
	£	s.	d.	£	s.	d.	£	s.	d.
E. Iles ..	3,900	0	0	1,080	0	0	5,280	0	0
Killingback & Co.* ..	1,447	5	0	689	9	5	2,146	14	5
J. Mowlem & Co.* ..	2,180	0	0	613	0	0	2,793	0	0
W. Neave & Son ..	1,993	0	0	1,128	0	0	3,121	0	0
D. R. Paterson ..	1,756	13	6	759	9	7	2,516	3	1
T. W. Pedrette ..	2,564	13	11	1,046	9	3	3,611	3	2
P. Smith ..	2,556	9	2	835	8	6	3,191	17	8

† Informal.

LONDON.—For cleaning, distempering, painting wards, etc., at the Infirmary, High-street, Homerton, N.E., for the Hackney Guardians. Mr. W. A. Finch, architect, 78, Finsbury-pavement:—
 P. & F. Steed .. £590 0 0 W. R. Athey .. £389 0 0
 W. Gray & Co. .. 581 9 8 P. McCarthy .. 370 0 0
 F. W. Harris .. 439 0 0 W. Dryden .. 368 0 0
 J. R. Cordell & Sons .. 320 0 0
 Sons .. 420 0 0 G. Wales & Co., Ltd. .. 223 0 0
 W. Silk & Son .. 410 0 0

LONDON.—For the erection of warehouse at Limehouse, E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C. Quantities supplied:—
 F. & T. Thorne .. £1,070 Todd & Newman .. £999
 S. Salt & Son .. 1,085 Watts, Johnson, & Courtney Fair .. 977
 bairn .. 1,049 Sheffield Bros.* .. 978
 T. Osborn & Sons .. 1,016
 † Accepted, with additions, at £1,050.

LONDON.—For alterations and repairs at the Fire Brigade Central Station, for the Finsbury Urban District Council:—
 Marchant & Hirst .. £339 Thompson & Sons .. £235
 W. Toot .. 295 S. J. King, Tottenham* 225
 G. & J. Claridge .. 285

LONDON.—For the erection of stabling at Stoke Newington, N. Messrs. Bousham & Herbert Riches, architects, 3, Crooked-lane, E.O.:—
 T. Osborn & Sons .. £492 Courtney & Fairbairn £433
 T. Osborn & Sons .. 493 Sheffield Bros.* .. 393

LONDON.—For paving works, Mare-street, for the London County Council:—
 J. O. White & Co. £10,595 17 6
 Mulrhead, Greig, & Matthews .. 9,818 3 11
 S. T. Moxham & Co. .. 9,379 19 11
 Improved Road Paving Co. .. 9,095 9 0
 Acma Flooring & Paving Co. 9,037 5 7
 W. Manders, Leyton* .. 8,982 12 3
 W. Griffiths & Co. 8,493 9 9
 [The amount of the chief engineer's estimate is £9,375.]

LONDON.—For coal and ash conveyors, Greenwich Generating Station, for the London County Council:—
 C. A. Ciss .. £7,393 17 0
 R. Dampster & Sons, Ltd. 7,270 17 0
 Soudner & Co., Ltd. 6,881 0 0
 Binks, Barnby & Co. 6,550 10 0
 Improved Road Paving Co. 4,970 10 0
 New Conveyer Co., Ltd., Smalwick* .. 4,763 0 0
 E. Allen & Co., Ltd. 4,582 0 3

LONDON.—Electric light installations, Tooley-street Station and Baywater at Kilburn sub-stations, for the London County Council:—

Tooley-street Station.

Alliance Electrical Co., Ltd.	£196	5	8
A. H. Marshall & Co.	153	10	0
E. J. Coleby & Co.	157	0	0
W. H. Johnson ..	154	7	0
Duncan, Watson, & Co.	153	0	0
O. Clark & Co.	152	0	0
G. Weston & Sons ..	150	0	0
National Electric Construction Co., Ltd.	148	0	0
Durrell & Co.	141	13	0
L. Sunderland & Co.	135	0	0
Rashleigh, Phipps, & Co., 102, Oxford-street, W.* ..	133	10	0

Baywater Sub-Station.

National Electric Construction Co., Ltd.	£195	0	0
Alliance Electrical Co., Ltd.	179	15	0
A. H. Marshall & Co.	184	5	0
D. Watson & Co.	184	0	0
E. J. Coleby & Co.	182	10	0
G. Weston & Sons ..	180	0	0
W. H. Johnson ..	183	7	0
Durrell & Co.	154	13	0
O. Clark & Co.	145	0	0
L. Sunderland & Co.	140	0	0
Rashleigh, Phipps, & Co., 102, Oxford-street, W.* ..	121	2	8

Kilburn Sub-Station.

Alliance Electrical Co., Ltd.	£192	9	0
National Electric Construction Co., Ltd.	188	0	0
D. Watson & Co.	175	0	0
E. J. Coleby & Co.	175	0	0
A. H. Marshall & Co.	174	10	0
W. H. Johnson ..	172	2	0
Durrell & Co.	171	13	0
G. Weston & Sons ..	170	0	0
O. Clark & Co.	165	0	0
L. Sunderland & Co.	149	0	0
Rashleigh, Phipps, & Co., 102, Oxford-street, W.* ..	143	0	0

LONDON.—For a 50 kilowatt electric generating plant, for the London County Council (Poplar Technical Institute):—
 Ballis & Morcom, 542c, and 28c, for drawings. —
 Brotherwood 541c.
 P. H. Allen, Son, & Co., £20c, and 15c, for drawings.
 W. Sissons & Co., Gloucester, 475c. (Drawings included).

LONDON.—For 233 lineal yds. of 12-in. diameter pipe sewer, etc., in Trafalgar-square, Park-lane, and Green-street, etc. (Contract No. 55), for the Westminster City Council:—

	No. 55.			No. 57.		
	£	s.	d.	£	s.	d.
E. Iles ..	£3,800	0	0	£1,080	0	0
T. W. Pedrette ..	2,564	13	11	1,046	9	3
P. Smith ..	2,556	9	2	835	8	6
J. Mowlem & Co.	2,180	0	0	613	0	0
W. Neave & Son ..	1,993	0	0	1,128	0	0
D. R. Paterson ..	1,756	13	6	759	9	7
C. W. Killingsback & Co., James-street, Camden Town* ..	1,447	5	0	689	9	5

LONDON.—For reinstating trenches in macadamised roads "during the current year," for the Westminster City Council:—
 J. Mowlem & Co., Ltd.* .. s. d.
 All trenches more than 5 yds. super, per yard. 3 0
 All trenches, 5 yds. super or less .. 3 6
 Minimum charge for any trench .. 7 0

LONDON.—For painting, sanitary alterations, etc., at infirmary in Harrow-road, for the Paddington Guardians. Mr. E. Howley Sim, architect, 8, Craig-court, W.C.:—
 F. W. Breck .. Boundary .. Sanitary ..
 287, Shire-street, wall, Section I. Section II. Section III.
 land-road, Paddington, & s. d. .. s. d. .. s. d.
 F. W. Breck 1,187 13 9
 E. Childley & Co., 58, Lyd-ford-road, Paddington, W.* .. 531 0 0 .. 7 10 0 .. 1,215 0 0
 Cruse & Baldwin 895 0 0
 Daulton & Co. 459 0 0 .. 19 0 0 .. 1,590 0 0
 Fowler & Co. 466 0 0 .. 12 0 0 .. 1,142 0 0
 G. Foxley .. 420 0 0 .. 18 10 0 .. —
 J. Greig .. 493 18 8 .. 5 0 0 .. —
 G. Grimwood & Sons .. 495 0 0 .. 32 10 0 .. 1,255 0 0
 J. P. Holliday 351 10 0 .. 7 10 0 .. 1,230 0 0
 G. Jennings 1,123 8 4
 Leslie & Co. 380 0 0 .. 8 15 0 .. 1,383 0 0
 Martin —
 Frauch & Co. 558 10 0 .. 15 0 0 .. —
 J. J. Richards 480 0 0 .. 14 10 0 .. —
 Vigor & Co. 383 15 0 .. 19 10 0 .. 1,240 0 0

LONDON.—For painting infirmary at Brook-street, S.E., for the Lambeth Guardians. Messrs. Woodward, Brooks, & Latta, surveyors, 399, Kensington-oval, S.E.:—
 C. J. Edwards .. Painting .. £325 3 1 .. 13
 W. A. King 715 0 0 .. 3
 Months.
 T. Pearce 700 0 0 .. 13
 Cruse & Baldwin .. 623 0 0 .. 10
 Wontner & Co., Ltd. 523 0 0 .. 8
 C. Withers 553 4 4 .. 5
 Spear, Saxon, & Co., Ltd. 543 0 0 .. 5
 Milson & Son 538 0 0 .. 12
 P. McCarthy 481 0 0 .. 9
 E. Mills 455 0 0 .. 3
 T. French 454 16 4 .. 9
 J. J. Richards 428 12 6 .. 10
 McCarthy 379 0 0 .. 10
 H. Brazg & Son 337 10 4 .. 8
 H. Kent 349 0 0 .. —
 A. H. Inas, Cannon-street-chambers, Bishopsgate-street, E.C.* .. 300 0 0 .. 5

LONDON.—For painting infirmary at Brook-street, S.E., for the Lambeth Guardians. Messrs. Woodward, Brooks, & Latta, surveyors, 399, Kensington-oval, S.E.:—
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 W. A. King 715 0 0 .. 3
 Months.
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 Spear, Saxon, & Co., Ltd. 543 0 0 .. 5
 Milson & Son 538 0 0 .. 12
 P. McCarthy 481 0 0 .. 9
 E. Mills 455 0 0 .. 3
 T. French 454 16 4 .. 9
 J. J. Richards 428 12 6 .. 10
 McCarthy 379 0 0 .. 10
 H. Brazg & Son 337 10 4 .. 8
 H. Kent 349 0 0 .. —
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 Spear, Saxon, & Co., Ltd. 543 0 0 .. 5
 Milson & Son 538 0 0 .. 12
 P. McCarthy 481 0 0 .. 9
 E. Mills 455 0 0 .. 3
 T. French 454 16 4 .. 9
 J. J. Richards 428 12 6 .. 10
 McCarthy 379 0 0 .. 10
 H. Brazg & Son 337 10 4 .. 8
 H. Kent 349 0 0 .. —
 A. H. Inas, Cannon-street-chambers, Bishopsgate-street, E.C.* .. 300 0 0 .. 5

NEATH.—For erecting a new public library, for the Corporation. Mr. D. M. Jenkins, Borough Engineer:—
 J. Goolridge & E. Thomas .. £3,947 0 0
 Son .. £1,200 0 0 Waring, Cole, & Davies .. 4,990 0 0
 D. Davies .. 4,990 0 0 Waring .. 3,840 10
 J. Rees .. 4,939 10 Neath* .. —

NOTTINGHAM.—For two houses and shops, Victoria-bank and Arkwright-street, Nottingham. Mr. A. R. Calvert, and Mr. William R. Gleave, architects, 13, Low-pavement, Nottingham:—
 W. Crues, Ltd. .. £1,593
 J. G. Short* (lowest of ten tenders) .. 1,593

WYNEHEAD (Wollington, Somerset).—For repairs and improvements at Wynhead Court, for Mr. G. S. Lysaght. Mr. T. J. Moss-Flower, surveyor, etc., 2, Victoria-mansions, Westminster, and Bristol:—
 I. K. Thomas & Son, The Triangle, Clifton, Bristol* .. £1,413 14 0

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Designs for Laying-out Open Space in Centre of Town	Borough of Welshpool	5l. 5s.	July 18
*Designs for New School in Poulton-road	Wallasey U.D.C.	Not stated	Sept. 30
*Designs for Proposed Pavilion at Low Green	Ayr Corporation	50l., 30l., and 20l.	No date.

CONTRACTS.

Nature of Work or Materials.	By whom advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
600 yds. of 18-in. Sewer at Tynbyedw	Rhondda U.D.C.	W. J. Jones, Engineer, Public Offices, Pentre, Rhondda	July 8
Stonebridge at Wainford	Bottom and Llskeard R.D.C.'s	S. W. Jenkin & Son, Lisbeard	July 9
Additions, etc., 66, High-street, Mortlake	Parochial Trustees	J. E. Anderson, Clerk, Office of Barons Council, High-st., Mortlake	do.
Meeting House, Langworthy-road, Seadley	Society of Friends, Manchester	F. Rowntree, Architect, 11, Little College-st., Westminster, S.W.	do.
Ch. of Scott's, Benton-ter., Sandy-f'd-rd., N.-on-Tyne	Visiting Com., Durham Co. Inn. Asy.	W. Crozier, County Surveyor, Shire Hall, Durham	do.
Two Cottage Blocks, Sedgfield	Municipal Charity Trustees	J. Jarvis & Son, Architects, Paradise-parade, King's Lynn	do.
Almshouses, Gaywood-road, King's Lynn	F. B. Lord	S. Segar, Architect, 24 and 26, Union-street, Newton Abbot	do.
House at Oaklands, Chudleigh	Cleckheaton U.D.C.	J. Arncliffe, Clerk, Town Hall, Cleckheaton	July 11
Stores	Rhymney Workmen Doctor's Com.	Dr. J. Jones, Cleveland, Pontlottyn	do.
House and Surgery, Pontlottyn	Bloomsfield Corporation	D. W. & Soper, 64, St. Mary Axe, London, E.C.	do.
Five Steel Road Bridges	W. Derby, Liverp'l, etc., Hos. Com.	C. H. Lancaster, Arch., Brougham-ter., West Derby-rd., Liverpool	do.
Outfall Drain for Hospital at Heswall	Banbridge R.D.C.	E. Wyly, Clerk, Workhouse, Banbridge, Co. Down	do.
Eight Labourers' Cottages	do.	do.	do.
Remodelling Labourer's Cottage	Manchester Education Committee	Fairbank & Wall, Architects, Craven Bank-chambers, Bradford	do.
Alterations to Farm Buildings, Bickleburgh Hall	Manchester Corporation	Education Offices, Deansgate, Manchester	do.
Iron Railings at Lily-lane Municipal School	Brighton Education Committee	Paving, etc., Dept. (Surveyor's Office), Town Hall, Manchester	do.
External Repairs of Pelham-street Council Schools	do.	T. Simpson & Son, 17, Ship-street, Brighton	do.
Roads, Preston	Thames Conservators	do.	do.
Internal Repairs, etc., of Board Room	Newark R.D.C.	R. Phillipson, Sec., Thames Conserv. Offc., Victoria-embank., E.C.	do.
Portland Cement	Manag. Bramf'd Non-Provided Sch.	H. Walker & Son, Enginrs., Albion-chambr., King-st., Nottingham	do.
9,700 yds. of Cast-Iron Water Mains, etc.	Sandgate U.D.C.	A. Pells, Architect, Beccles	do.
School Additions, Bramfield	Norwich Corporation	A. R. & Sons, Architects, 88, Whiting-st., Bury St. Edmunds	do.
Four Houses and Cottages, Elmwell	Messrs. O'Roan & Co.	L. J. D. Brockman, Clerk, 48, Sandgate-road, Folkestone	do.
Highway Materials	Hindley U.D.C.	J. F. M. Allen, Architect, 30, South Mall, Cork	do.
Brick Chimney, City Asylum, Hellesdon	Cottingham U.D.C.	A. Holden, Engineer and Surveyor, Council Offices, Hindley	do.
Works at 29, Patrick-street, Cork	Norwich Education Committee	J. H. Hanson, Surveyor, Market Green, Cottingham	do.
Road Improvement Works	Hove Education Committee	C. J. Brown, Architect, Cathedral Offices, The Close, Norwich	do.
Materials	do.	H. H. Scott, Borough Surveyor, Town Hall, Hove	July 12
Infants' School, Colman-street, Norwich	Managers of Stafford Council Schools	do.	do.
Painting, Alterations, etc., Connaught-road Schools	Eastbourne Electric Light Com'ttee	H. T. Sandy, Architect, 22, Green-gate, Stafford	do.
Internal Painting, etc., Ellen-street Schools	Crewe Town Council	D. J. Bove, Borough Surveyor, Town Hall, Eastbourne	do.
Distemping, etc., Portland-road Schools	Salford Education Committee	G. Eaton-Shore, Borough Surveyor, Heath-street, Crewe	do.
Elementary Schools, etc., St. Leonard's-avenue	Cardiff Corporation	Director of Education, Chapel-street, Salford	do.
Motor Omnibus House, Roselands	Bromley Borough Council	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
Silt Basin, Queen's Park	Willساد D.C.	Borough Engineer, Municipal Offices, Bromley Kent	do.
Painting, etc., Royal Technical Institute	East India Ry. Co.	J. Beady, Hayton, Maryport	do.
Painting, etc., Bute-street and Canton Police Stations	Beckenham Education Committee	Council's Engineer, Public Offices, Dym-street, Aberdeen	do.
Seven Covered Dust Vans	do.	A. Stronach, Jun., & Son, 20, Belmont-street, E.C.	July 13
Painting Congregational Chapel, Hayton, Maryport	Dewsbury Gas Committee	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Road-making and Paving Works	do.	J. A. Angell, Surveyor, Beckenham	do.
Steading on Farm of Crookmore, Tullynnessil, Alford	Lloyd & Yorath, Ltd.	R. & S. Williams, Architects, Wharton-street, Cardiff	do.
Deck Spans for New Barkar Bridge	Olomorgan County Council	C. W. Taylor, F.R.I.B.A., St. John-street, Newcastle-on-Tyne	do.
Alterations, etc., Alexandra Schools	Reigate Corporation	A. C. Craven, Gas Engineer, Gasworks, Savile Town, Dewsbury	do.
Painting, Repairs, etc., of Elementary Schools	do.	Landwood & Griggs, Arch., Metropolitan B'k-chbrs., Newport, Mon.	do.
Walter's, Minny's Congregational Ch'ls, Cathays, Cardiff	do.	T. Mansel Franklin, Clerk, County C'n'l Offices, Westgate-st., Cardiff	do.
Wesleyan Mission Room at Seaton Hirst	do.	Borough Surveyor, Municipal-buildings, Reigate	do.
Alterations, etc., of Dry Gas Meters	do.	do.	do.
Cast-Iron Gas and Water Pipes	do.	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
Rebuilding the "Three Salmons" Inn, Bassaleyl	do.	J. Wittet, Architect, Elgin	do.
Boys' School, Tonyrefail	do.	G. Winter, Borough Surveyor, Darlington	do.
2,500 Tons of Granite	do.	Borough Surveyor, Town Hall, Broadway, Hammersmith	do.
2,680 yds. of Tarpaving	do.	E. M. Bruce-Vaughan, F.R.I.B.A., Cardiff	do.
7,987 yds. of Retopping	do.	T. H. Yallock, City Engineer, 63, Queen-square, Bristol	do.
184 yds. of Tar Macadam	do.	C. E. Davenport, Engineer and Architect, Nantwich	do.
880 yds. of Artificial Stone Paving	do.	Walker & Collinson, Architects, Swan-arcs, Bradford	do.
Forming and Metalling Carr gateway, Windsor-road	do.	do.	do.
Paving, etc., Windsor-road	do.	J. J. Jackson, School Board Offices, Howard-gardens, Cardiff	do.
Repairs, Earlside Farm Buildings	do.	E. Jones, Architect, 10, Albion-street, Hanley	do.
Shelter at Bank Top Park	do.	do.	do.
Reconstructing River Wall at Chancellor's Wharf	do.	do.	do.
Church and Parish Hall at Rosedale	do.	do.	do.
Culvert & River Wall, Greville-Smyth Park, Bedminster	do.	do.	do.
Schools, Welsh-row, Nantwich	do.	do.	do.
200 lineal yds. of Road Making, Ballidon	do.	do.	do.
600 lineal yds. of 9 in. Pipe Sewing, Baldon	do.	do.	do.
Painting Schools	do.	do.	do.
Administrative Block, Smallpox Hospital, Bagnall	do.	do.	do.
Isolation Pavilion, Smallpox Hospital, Bagnall	do.	do.	do.
Laundry & Amulance Block, Smallpox Hospital, Bagnall	do.	do.	do.
Mortuary Block, Smallpox Hospital, Bagnall	do.	do.	do.
Boundary Wall g & Fence, Smallpox Hospital, Bagnall	do.	do.	do.
Water Storage Tank, Smallpox Hospital, Bagnall	do.	do.	do.
Sewage Disposal Works, Smallpox Hospital, Bagnall	do.	do.	do.
Discharging Block, Smallpox Hospital, Bagnall	do.	do.	do.
Ch. Shed, Smallpox Hospital, Bagnall	do.	do.	do.
Boards and Paths, Smallpox Hospital, Bagnall	do.	do.	do.
Drainage of Hospital, Smallpox Hospital, Bagnall	do.	do.	do.
Steam Disinfecter, Smallpox Hospital, Bagnall	do.	do.	do.
Incinerator, Smallpox Hospital, Bagnall	do.	do.	do.
Fifteen Labourers' Cottages, Toomebridge & Randalstown	do.	do.	do.
Five Labourers' Cottages, Crumlin	do.	do.	do.
Rushall Flood Prevention Works	do.	do.	do.
Screens and Swing Doors to Shelter, Prince's-parade	do.	do.	do.
Painting Grange Council School	do.	do.	do.
Repairs at Workhouse Infirmary, Ore	do.	do.	do.
Brick, etc., Work, Robroyston Smallpox Hospital	do.	do.	do.
*Sewer Work at Mare-street and Darley-road	do.	do.	do.
*Painting & Decorating Council Chbr., etc., Town Hall	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by]	Tenders to be delivered
Iron and Steel Works for Factory Extension	C. Akrlil & Co., West Bromwich	T. D. Neal, Secretary, 127, Edmund-street, Birmingham	July 15
Steel Box Girders, Whitehall-road, Leeds	Leeds Corporation	City Engineer's Office, Leeds	do.
Extending Abutments and Piers to Two Footbridges Road Metalling	do.	do.	do.
Exten. of Fiew'd Factory, etc., Craigleith Poorhouse	Lowestoff Corporation	G. H. Hamby, Borough Surveyor, Town Hall, Lowestoff	do.
Urginal, Gorgie-road	Edinburgh Parish Council	A. Ferrier, Clerk, Parish Council Hbrs., Castle-terrace, Edinburgh	do.
*New Constnrd Buildings at Weybourne, Norfolk	Edinburgh City Council	Borough Engineer, City Chambers, Edinburgh	do.
Stone Boundary Wall, Bourn-place, Plymouth	Admiralty	Admiralty Office, 21, Northumberland-avenue, W.C.	do.
Outside Painting, Upton Asylum, Chester	do.	G. Gilly & Son, 17, Saltash-street, Plymouth	July 16
Brick Chimney Stack at Well-hot, Cambuslang	Lanark Middle Ward District Com.	H. Bewick, County Architect, Newgate-street, Chester	do.
Permanent Way for Tramways	Radcliffe U.D.C.	W. L. Douglas, District Engineer, District Offices, Hamilton, N.B.	do.
500 Tons of Cast-iron Pipe Sts.	Workington Corporation	W. L. Radwell, Engineer, Council Offices, Radcliffe, Lancashire	do.
Private Street Works, Victoria-road	Staines U.D.C.	W. L. Baglefield, Borough Engineer, Town Hall, Workington	do.
Draining Part of Tudhoe Cemetery	Spennyuor U.D.C.	E. J. Barrett, Engineer and Surveyor, Town Hall, Staines	do.
Repairs to Sutton Mandeville Rectory, etc.	City of Wakefield	C. R. Spencer, Surveyor, Silver-street, Spennyuor	do.
*Free Library Buildings	Governors Cheltenham Gram. Schll	A. T. Love, Hinton St. George, Somerset	do.
Extension of 134, Queen-street, Cardiff	Mr. T. Stevens	Cox, Trinnell & Davison, 4, Adam-street, Adelphi, W.C.	do.
Vicarage House, Yvishir, Porth, Pontypridd	Rev. S. Jones	J. W. Rodger, F.R.I.B.A., 17, Regent-street, Cheltenham	July 17
Extension of Cleethorpes Pier and Pavillon	Great Central Railway Co.	do.	do.
Private Street Works, Cooper's-terrace, Thornley	Eslington R.D.C.	R. St. George Moore, M.Inst.C.E., 17, Victoria-street, S.W.	July 18
School of Art	Bradford Education Committee	Council's Offices, Basington, Co. Durham	do.
Road between Brighton and Glenbuck-roads	Sariton U.D.C.	F. R. E. Edwards, City Arch., Whitaker-bldgs., Brewery-st., Bradford	do.
1486 lineal yds. of Foul Sewer	Canterbury Drainage Committee	J. Bell, Clerk, Council Offices, Ewell-road, Sariton	do.
300 yds. of 9-in. Surface Water Drains	do.	A. C. Tully, City Engineer, Guildhall-street, Canterbury	do.
1,400 yds. Concentric Feeder Cable	Rhyl U.D.C.	do.	do.
Wall, Haddenham Girls' School	Isle of Ely Education Committee	E. H. Wight, Electricity Works, Rhyl	do.
Repairs & Painting, Upton-st. Fire Sta., Stockport-rd.	Manchester Watch Committee	R. S. W. Perkins, County Surveyor, Ely	do.
Repairs & Paint. to 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000	do.	City Architect, Town Hall, Manchester	do.
Painters Work, Canal-st. Police Sta., New Brighton	do.	do.	do.
Repairs & Painting, New-st. Fire Sta., Newton Heath	do.	do.	do.
Painting Outside of Victoria Buildings and Hotel	do.	do.	do.
Drainage, Applethorpe Reservoir	Manchester Improvement Committee	W. R. Conlan, C.E., 146, West Regent-street, Glasgow	do.
*Erection of Shop, Corner Brookwood-park, Wandsworth	Port Glasgow Town Council	J. Hy. Jones, 18, Adam-street, Strand	do.
*Excavating, Levelling, etc., at Foleshill	The Land Development Syndicate	General Manager, Gas Works, Coventry	do.
Reconstruction of Four Bridges, Pualoo	Coventry Corp., Gas Committee	L.C.C.	do.
Town and Stores	Southern Mahabatta Ry. Co.	M. Fitzmaurice, Engineer, County Hall, Spring-gardens, S.W.	July 19
Broken Granite	Woodford U.D.C.	E. Z. Thornton, 46, Queen Anne's-gate, Westminster	do.
1,900 Tons of Broken Granite	Bedford Corporation	W. Farrington, Surveyor, Council Offices, Woodford Green, N.E.	do.
20,000 Gallons of Cresote per week	Great Western Railway Co.	H. Baxter, Town Clerk, Bedford	do.
950 yds. of 4-in. Cast-iron Water Mains	Hertford Corporation	G. K. Mills, Secretary, Baldington, London	do.
300 yds. of 9-in. Stoneware Pipe Surface Drains	do.	J. H. Jevons, Borough Engineer, Hertford	do.
Burial Ground-Works, Harchaw	Annfield Plain U.D.C.	do.	do.
Reconst'g 3 Bks of Latrines, E. Tiverton Shl., Bath	Somersct County Council	T. J. Trowsdale, Surveyor to Council, Annfield Plain	do.
Gates, N. and S. Custom House Quay, Cork	Harbour Commissioners	W. F. Bird, Architect, Midsomer Norton	do.
Main Extensions	Dartford U.D.C.	Engineer's Office, 9 and 10, Lapp's Quay, Cork	do.
*Underground Conduits, Fleet-street	Corporation of London	A. J. C. Waterland, Electrical Engineer, Council Offices, Dartford	do.
*Sewer Work	do.	Engineer, Public Health Department, Guildhall, E.C.	do.
*Goods Shed and Stable at Hayes Station, Middlesex	G.W. Ry. Co.	Company's Engineer, Paddington Station, W.	do.
*Stores, etc., at Signal Works, Reading	do.	do.	do.
*Goods Shed, Engine Shed, etc., at Sequehay, Cornwall	do.	do.	do.
*Repainting, etc., Southern Outfall Works, Cressness	London County Council	Council's Chief Engineer, County Hall, Spring Gardens, S.W.	do.
Swimming Bath, etc., Stamford New-road	Altrincham P.D.C.	J. Stoke, Clerk, Town Hall, Altrincham	July 20
Painting, etc., Hulimary	Bratford Guardians	W. Stephens, Clerk, Union Offices, Iskworth, W.	do.
Bridge, Ferry Preston, near Castleford, New Brighton	N.E. Ry. Co.	W. J. Cudworth, Company's Engineer, York	do.
Valve Rods, Castings, Screens, etc. (Palla Machine)	Edinburgh & District Water Trustees	W. A. Tait, Engineer, 72A, George-street, Edinburgh	do.
Cast-iron Beams, Platforms for Valve Towers, e.c.	do.	do.	do.
Stoneware Sewerage	Uttoxeter R.D.C.	Willcox & Raikes, Engineers, 63, Temple-row, Birmingham	do.
*Tar Paving, etc., at Trower Asylum	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
*Cleansing and Painting Works at Head Office	do.	do.	do.
*Surface Water Drainage, etc., Down School, Sutton	do.	do.	do.
*Repairs, Tar Paving, Park Hospital, Hither Green, S.E.	do.	do.	do.
*Fire-resist., etc., 10 Wards, etc., N.W. Hos., Hampstead	do.	do.	do.
Alter, etc., Houses, Devonshire & Bond-st., Broughton	do.	do.	do.
Granite, Gravel, etc.	do.	do.	do.
288 yds. of 9-in. and 436 yds. of 6-in. Pipe Sewer	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	July 21
Electric Lighting, Municipal Technical School	East Barnet Valley U.D.C.	H. York, Surveyor, Station-road, New Barnet	do.
Tar Ash Footpath, Marine-avenue	Heyland Nether U.D.C.	W. P. Young, Engineer, Town Hall, Heyland, near Barnsley	do.
*New Sorting Office at Lower Edmonton	Plymouth Education Authority	H. J. Suel, Architect, 11, The Crescent, Plymouth	do.
250 yds. of Earthenware Pipe Sewer, Tideswell	Whitley and Manskeaton U.D.C.	J. P. Spencer, Architect and Surveyor, 30, Howard-st., N. Shields	July 22
600 Cast-iron Socket Pipes, etc.	H.M. Office of Works	H.M. Office of Works, Storey's-gate, Westminster, S.W.	do.
Casting Pipes and Building Brick Manholes	Bakewell U.D.C.	W. Parker, Education Offrs., Leeds	do.
Three-throw Hard-water Pump	Sandbach R.D.C.	A. E. Stringer, Clerk, Sandbach	July 23
Extension of Refuse Destructors, Durnsford-road	do.	do.	do.
New Schools, Boundary Walls, and Out-Buildings	Wimbledon U.D.C.	Engineer and Surveyor, Council Offices, Wimbledon	do.
Chapel, Treasury	Staffs. Education Committee	H. T. Sandy, Architect, 22, Green-gate, Stafford	do.
Town Hall and Municipal Buildings, Stockport	Ranah Welsh Congregational Ch.	T. Skyn, 187, Butc-street, Teorochy	do.
Water Supply Works	Stockport Borough Council	A. Brunwell Thomas, Architect, 5, Queen Anne's-gate, S.W.	do.
*Making-up Kingsland, Olive, Patrick, & Coronat'n-rds.	Thames U.D.C.	J. Taylor, Sons & Sons, Engineers, Town Hall, Chapel-sole-Frith	July 25
*Erection of Law Courts, Lower	C.B. West Ham	Borough Engineer, Town Hall, West Ham, E.	do.
*Science and Art Buildings, Church-street	do.	do.	do.
College, St. Emma, Letterkenny	Kingston-on-Hull Corporation	City Treasurer, Town Hall, Hull	July 28
Extension of Scabrier Harbour, Caltiness	Advrs. of Tewkesbury Gram. School	Borough Surveyor, Tewkesbury	do.
*Completion of Well, Provisional Engine, etc., Hun, etc.	Rev. Dr. O'Donnell	T. P. M'Namra, Architect, 59, Brunson-street, Dublin	July 29
Painting, etc., Schools	Harbour Trustees	J. Barrow, C.E., Central Chambers, 216, Union-street, Aberdeen	do.
Painting Schools	Welyun R.D.C.	R. E. Middleton, M.Inst.C.E., 17, Victoria-street, S.W.	Aug. 2
Shop and House, St. Matthew's-street, Ipswich	Netherlands Colonial Office	M. Nyhof, Nobel-street, 18, The Hague, Holland	Aug. 30
Newland Congregational Church, Beverley-road, Hull	Leeds Education Committee	Mr. McClelland, Master of Wks., 6, Grange-ter., Battlefield, Glasgow	No date
Extension of Engineering Works, Shipley	Cathcart School Board	Davidson & Phillipson, Arch., 32, Clayton-st. W., Newcastle-on-Tyne	do.
Shops and Dwelling-houses, Falls-road, etc., Belfast	Mr. W. Brewer	R. W. Leighton, Architect, 6, Princess-street, Ipswich	do.
Dwelling-houses in Albion-street, Belfast	do.	Monks & Porritt, Architects, 77, King-street, Manchester	do.
Stabling and Storage, Derby Court, Belfast	J. M'Keown	J. H. Bakes, Arch. & Surv., Colverley-bldgs., Victoria-st., Leeds	do.
Hot-water Heating Apparatus, Clerwell Schools	Banbury Education Committee	W. J. Moore, Architect, Royal Chbrs., 35, Royal-avenue, Belfast	do.
Eighty Wood-working Benches	Bradford Education Committee	do.	do.
Eighty Iron Valves and Fittings	do.	W. E. Mills, Architect, 12, Horse Fair, Banbury	do.
Warehouse, 13 and 14, Crichton-place, Cardiff	Messrs. Thistle, Hall & Co.	T. Garbutt, Secretary, Education Office, Bradford	do.
Painting Works	Morley Town Council	do.	do.
Alterations to Store, St. George's-street, Winchester	Trustees, etc., Gosham Mem. Hospital	W. E. M. Corlett, Architect, Castle-street, Cardiff	do.
Hospital Buildings, Kingswood, Bristol	County Borough of Stockport	W. E. Pntman, Borough Engineer, Town Hall, Morley	do.
		Winchester & District Co-opera. Soc., 4, The Square, Winchester	do.
		F. Bligh Bond, F.R.I.B.A., Star Life Bldgs., St. Augustines, Bristol	do.
		The Technical School, Stockport	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be to
Clerk of Works	St. George's Union	4l. 4s. per week	July 12
Clerk of Works	Chiswick U.D.C.	2l. 10s. per week	July 15
Journeyman Plumber	Government of St. Helena	10l. per Month	July 18

Those marked with an asterisk (*) are advertised in this Number. L. Competitions, lv. Contracts, lv. vi. viii. x. Public Appointments, xvi.

TENDERS.—Continued from page 53.

STRETFORD.—For making-up streets for the Urban District Council. Mr. E. Worrall, Surveyor, Council Offices, Old Trafford.—

	Albert-street.		Northumberland-rd., Stretford-rd., to Chester-rd.		Trafford Park.					
	£	s. d.	£	s. d.	Sixth-street.	Eighth-street.	Second-avenue.	£	s. d.	
W. H. Worthington.....	*186	2 5	634	13 1	793	9 11	739	19 6	1,386	15 10
M. Naylor & Sons.....	191	13 0	581	17 9	905	7 8	895	0 6	1,603	18 3
G. Clarke & Sons.....	201	5 6	584	3 0	884	0 4	873	3 4	1,573	9 5
W. Clarke.....	189	18 4	604	16 1	891	7 10	878	18 11	1,568	13 1
G. Bosson.....	190	4 7	575	11 1	867	10 11	856	17 7	1,512	16 9
W. Snape & Sons.....	197	1 3	681	8 5	867	6 5	859	1 6	1,630	14 11
J. Randall.....	200	3 8	592	12 9	849	5 4	842	19 3	1,453	14 7
Gosling & Stanford.....	204	11 5	525	16 9	788	10 3	*768	19 2	*1,349	17 7
R. Louax.....	204	0 2	638	15 1	955	18 7	911	10 8	1,704	14 2
J. Culshaw.....	236	8 7	628	4 2						
W. Woodfine.....	249	11 7	698	4 4	977	9 1	965	10 4	1,791	13 7
J. Conroy.....	198	3 5	914	13 0	1,063	15 0	1,197	18 2	1,983	13 6
Johnson & Hindley.....	241	18 6	775	0 10	1,075	14 3	1,090	9 0	1,824	4 11

OSHLITREE.—For forming a new cemetery, for the Parish Council. Mr. Allan Stevenson, surveyor:—
R. Crawford, New Cannon*..... £777

OTLEY.—For private street works, for the Urban District Council. Mr. J. E. Sharpe, Engineer and Surveyor, Council Offices, Otley:—
D. Speight & Son..... £1,829 7 11
T. Wade..... 1,668 12 1
J. Speight..... 1,641 6 9
J. Midgley..... 1,612 11 2
S. Bedford & Son..... 1,563 7 5
Ross & Crabtree..... 1,556 3 0
R. Naylor & Son..... 1,460 0 6
J. Hamman..... 1,437 14 8
G. Parsons £1,427 14 11
J. & J. Watmough..... 1,411 1 8
W. Keighley..... 1,373 18 9
R. Pickett & Son..... 1,363 14 1
H. E. Buckley..... 1,356 18 0
M. Hall & Ward K. Telfer Bradford*..... 1,335 9 11

RAMSGATE.—For making-up Napleton-road and continuation, for the Town Council. Mr. T. G. Taylor, Borough Surveyor, Albion House, Ramsgate:—
J. Mills..... £697 10 0
J. K. Budge..... 538 10 0
W. Wilson, Ramsgate*..... 510 0 0
[Borough Engineer's estimate, £587 14 8.]

READING.—For the erection of buildings at the Wokingham-road Council Schools, for the Reading Education Committee:—

	£	s.	d.	Weeks.
Collier & Catley.....	211,111	—	—	60
F. Newberry.....	10,875	—	—	—
F. J. Margrett.....	10,695	—	—	—
McCarthy Fitt.....	10,567	—	—	56
Lewis & Bro.....	9,350	—	—	60
W. Watson.....	9,800	—	—	50
A. Faulkes.....	9,697	—	—	—
J. Dallow & Son.....	9,150	—	—	50
E. C. Hughes.....	9,100	—	—	—
C. H. Hunt & Son, High Wycombe*.....	8,970	—	—	40

For the Engineering and Hot Water Work at the School:—
Margrett & Alsbrook..... £473 0 0
Rosser & Russell..... 432 10 0
J. Spencer, London-road*..... 365 0 0

RUABON.—For erecting a Calvinistic Methodist chapel at Groes, Penrice. Mr. T. Rees Evans, architect, Dinorwic House, Johnstown, Ruabon:—
Jenkins & Jones..... £1,498 0 0
Parry Bros..... 1,394 0 0
Ll. Davies..... 1,268 19 6
J. T. Jones, Cefn Mawr, Ruabon*..... 1,263 0 0

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SPENNYMOOR.—For making-up Park-crescent, Back Park-crescent, and Park-crescent Cross-street, for the Urban District Council. Mr. C. R. Spencer, surveyor, Silver-street, Spenny-moor:—
G. H. Bell, Bishop Auckland*..... £190 10 0

SULLY.—For erecting two cottages, for Mr. A. T. Stephens, Sully Grange. Mr. R. B. Batchelor, architect, 19, Duke-street, Cardiff. Quantities by the architect:—
W. Vaughan..... £560
J. Britton, Dinas
T. Bevan..... 530
F. Cousins..... 520
Gibby & Cleak..... 444
£502

WORTHING.—For the erection of refuse destructor buildings and chimney on land adjoining the sewage pumping station, for the Corporation. Mr. F. Roberts, Borough Engineer and Surveyor:—
A. Crane..... £2,590 18 1
J. Riley..... 2,528 6 3
Myles & Warner..... 2,385 0 0
Langley & Co..... 1,895 0 0
J. A. East..... 1,770 0 0
Peerless, Dennis & Co..... 1,767 0 0
Rowland Bros., Hooisland*..... 1,680 0 0
Waltham Custodis Chimney Construction Co., Ltd..... 535 0 0
[Surveyor's estimate, £1,789 6s. 11d.]
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ILLUSTRATIONS.

West Towers, Jumièges	From a Photograph.
Staircase, Deptford Town Hall	Messrs. Lanchester, Stewart, and Rickards, Architects.
Witham Hall, Lincolnshire, as re-constructed	Mr. A. N. Prentice, F.R.I.B.A., Architect.
House at Peebles	Mr. A. Hunter Crawford, F.R.I.B.A., Architect.

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Notes and Sketches in Southern Italy (contd.):—

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The Planning and Construction of Gas Works.



THE planning and construction of gas works calls for engineering rather than for architectural ability, but there is nevertheless ample scope for architectural skill to be brought into action in the design and erection of the extensive buildings required for the housing of machinery and plant on all modern gas works of importance. The prosperity of the gas industry in this country, which is to a considerable extent due to the general use of gas for fuel and power purposes, is responsible for the growing dimensions of the various buildings and structures required in connexion with the manufacture, distribution, and sale of gas. With their increasing magnitude, these structures are becoming more and more conspicuous features of all our large towns, and it is, therefore, a matter of public concern that, as far as is practicable, they should be of architectural or artistic merit.

Smoke, dust, and stink are concomitants of the carbonisation of coal and the treatment of residuals which cannot, perhaps, be altogether avoided, but a gas works need not be an eyesore even in a rural district. Contrary to general belief, the atmosphere of a gas works is not prejudicial to plant life; and trees, shrubs, and flowering plants may be

seen growing luxuriantly within the walls of many gas works both in town and country. With good engineering, reputable architecture, and a little attention to horticulture and arboriculture, a gas works may become almost as inoffensive as a well-kept water works. In justice to the gas engineering profession, it must be admitted that constructions formed of a miscellaneous collection of old boiler-plates, corroded sheets of corrugated iron, and dilapidated window frames obtained by hargaining with house-breakers, which do duty as factory buildings in many industries, are seldom seen on a gas works, and that in many instances everything that can reasonably be looked for in the way of good building has been accomplished.

The issue of a ninth edition of Hughes's small handbook on gas works* calls to memory the many changes which have occurred in gas engineering practices during the fifty years which have elapsed since the first edition was published. The adoption of stoking machinery operated by compressed air, hydraulic power, or electricity, has only become general within the last fifteen years; and plant for the generation of carburetted water-gas was not erected in this country until the year 1891; whereas more than one hundred British gas works are now provided with manufacturing plant of this description. Gas-holders have largely increased in dimensions, and notable changes in the methods of con-

structing them have been witnessed. The erection of plant for the manufacture of sulphate of ammonia has become general, and gas is commonly distributed under higher pressures than formerly. The erection of special buildings for the cleaning and repairing of gas fires and cookers, and the provision of one or more show-rooms in the business quarter of the town supplied with gas, may also be regarded as comparatively modern developments of the industry.

In the preface to this ninth edition it is stated that all out-of-date references have been eliminated, but several paragraphs which reveal the antiquity of previous editions of the book have escaped Mr. O'Connor's revision. For example, turning to the description of Sir George Livesey's gas-holder of 12,000,000 cubic ft. capacity, which was erected at East Greenwich more than ten years ago, we read that "the tank of this holder, which is now in the course of construction, is 304 ft. in diameter and 31 ft. 6 in. deep, and projects 17 ft. above the level of the ground, for, on account of the abundance of water in the site (as it adjoins the Thames) the excavation could not be sunk deeper without extraordinary expense in pumping." Again, on page 80, it is stated that "gas lighting was first introduced about eighty years ago"; as a matter of fact, Professor Lewes delivered the Murdoch memorial lecture, entitled "A Century of Work on the Development of Light from Coal Gas," before the Gas Institute twelve years ago; and on

* "Gas Works: Their Construction and Arrangement and the Manufacture and Distribution of Coal Gas." Originally written by Samuel Hughes. Ninth edition, revised by Henry O'Connor. London: Crosby Lockwood and Son., 1904.

page 81 of the book itself reference is made to Creighton's attempt to introduce mechanical stoking for gas manufacture in the year 1808.

The book discusses in a general manner most of those subjects which ought to be studied in detail by every gas engineer. This cursory treatment renders it interesting to those who are not professionally associated with gas manufacture, but who nevertheless take an intelligent interest in industrial operations. It also makes the book valuable to the young gas student, since it places before him in readable form much accurate and useful information, and is likely to induce him to turn for further information to those larger treatises on gas engineering which deal with the same subjects in fuller detail. The principal fault of the present edition is that, although many new and useful paragraphs have been added, the book has not been brought quite abreast of the times. We find no mention, for instance, of the Dellwik process of water-gas manufacture, although Dellwik plant has been working at Ilford, Tipton, West Bromwich, and elsewhere for a considerable period. The electrical charging machines now in use at Derby, Paris, and other places have also escaped mention. On the other hand, the references to brick retorts might with advantage have been deleted.

The most seriously defective chapter is that on "Burners and Glasses." Incandescent lighting under normal pressures is dismissed in a short, but very much out-of-date and misleading paragraph; while, in a subsequent paragraph, the reference to a home-made lamp using hot gas and hot air, and having an efficiency of eighty-six candles per cubic ft. of gas consumed, should, in our opinion, have been omitted.

A detailed description of the planning and construction of a large modern gas works would fill a volume of considerable dimensions, and could hardly be attempted in these columns; but much of the constructive work which has to be carried out on such a works is of general interest to all concerned with building, and we may take the present opportunity of referring to the principal noteworthy features associated therewith. Before proceeding, however, it may be well to briefly refer to the order of procedure in gas manufacture as commonly carried on in the larger British factories.

The coal has to be unloaded from ships or barges and conveyed to the coal stores, or, if the coal has to be imported by rail, the trucks are shunted on to a siding, and thence direct to the coal stores. From the stores the coal is transferred to the hoppers of machines which place the coal in red-hot retorts. Each retort receives a charge of 6 cwt. of coal. The number of retorts varies, of course, with the quantity of gas to be produced, but a retort-house of fairly large dimensions will contain, say, 150 retorts; and on a large works four or five of these retort houses will be provided. The Beckton works are built on a much larger scale, but these are exceptional. The retorts are heated in furnaces maintained at a bright red heat by the combustion of producer gas generated in

producers situated beneath the furnaces, the producers being fed with hot coke. The gas evolved when the coal is placed in the retorts passes up ascension pipes to the hydraulic main, and thence through the condensers, washers, scrubbers, purifiers, and station meters to the gas-holders. Tar and ammoniacal liquor are collected from the hydraulic main, condensers, and washing apparatus, and are stored in large tanks or watertight wells. Five or six hours after the coal has been placed in the retorts gas ceases to be evolved, and the residual coke is then withdrawn and quenched with water. The retorts are immediately recharged with coal. It is important that the gas should not be allowed to accumulate under pressure in the retorts, and, as the washers, scrubbers, purifiers, and gas-holders throw considerable "back pressure," a description of pump termed an "exhauster" is connected to the inlet of the washers or condensers. The exhauster draws the gas from the retorts as rapidly as it is evolved from the coal, and forces it through the purifying apparatus into the gas-holder.

Site and General Design.—In many instances gas works established more than fifty years ago on the outskirts of a small town have gradually been hemmed in on all sides by dwelling-houses, until at length they have become more or less centrally situated in a thickly-populated district. The ground adjoining the works has meanwhile become too valuable to permit of its purchase for extensions, and the site occupied by the works has also increased in value. Consequently, a new and larger site more remote from the residential portion of the town has been secured for the manufacturing department; while the large blocks of offices and show-rooms which have become necessary, owing to the increase in the number of gas consumers, the development of the business of supplying fires and cookers on the rental system, and the increased office work entailed by the popularity of the penny-in-the-slot meter, have been erected on a portion of the old site or on some other site conveniently situated in the business quarter of the town. The central offices are, of course, in telephonic communication with the works. In London, more than a quarter of a century ago, the Gas Light and Coke Company found it expedient to close their city manufacturing stations and erect new works at Beckton, some seven miles distant, on a site of over 300 acres in extent. The most recent important removal is that of the Hastings and St. Leonards Gas Company, who will shortly commence manufacturing on their new works, now nearing completion, which have been erected at Glynne Gap, on the waste land between St. Leonards and Bexhill. Similarly new works to supply Edinburgh with gas were last year opened at Granton.

The site selected for a gas works should be one of the lowest levels in the district, and should be one on which coal can be readily and economically delivered. Water carriage is, as a rule, the cheapest, and a waterside site is therefore usually selected if available. Failing this, a site adjoining a railway is chosen. The soil should by preference be one in which a

brick or concrete gas-holder tank, say 40 ft. in depth, can be readily constructed. The water met with excavating is often a source of great expense and inconvenience to the gas engineer. In colliery districts the soil should be one to which the coal can most economically be conveyed direct from the mine to the retort houses.

In the case of waterside works it is common practice to raise the coal from the ships or barges in buckets or grabs by means of steam or hydraulic cranes, the coal being discharged into trucks on a high-level railway. The trucks are propelled along overhead trestle-work lines into the upper part of the coal stores, which adjoin, or form a portion of, the retort houses. From the trucks the coal is allowed to fall into its allotted place. On large works small locomotives running on a ground level track are used for the transport of material and from different parts of the works. The relative positions of the various buildings required for plant and machinery must differ in accordance with differences in local conditions.

In planning a works only one entrance should be provided; and close to this entrance should be the gate-keeper's lodge, the weighbridge, the store-keeper's offices, and any offices to which the general public must have access. In many cases a house is provided on adjoining the works for a resident foreman or manager, and in such cases the residence should be close to the entrance, or else have a front entrance opening upon the public street, and a back side entrance in direct communication with the works. It is desirable that unauthorised persons should not be able to gain access to, nor employees to leave, the works without passing the gate-keeper.

Coal Stores.—The coal stores are frequently situated within the retort houses. In other cases they are merely covered spaces without walls situated in close proximity to the retort houses. The proportionate storage space required is dependent upon the facility with which fresh supplies can be obtained. A works adjoining a colliery need not stock a large supply, but where the supply has to be brought from a distance, and the delivery is liable to interruption, a large stock must be maintained. Generally speaking, provision should be made for the storage of at least as much coal as will be required during two winter months.

Retort Houses.—These should be substantially built of brick, and have, in preference, slate roofs. There are two stages in most modern houses—a lower upper stage from which the retorts are charged and the residual coke with drawn, and a lower stage from which the furnaces are clinkered. The red-hot coke, as it is raked out from the retorts is allowed to fall through an opening in the upper stage to the lower stage, where it is quenched with water. The upper stage is usually about 10 ft. above the lower, and is commonly formed of cast-iron plates supported on iron columns. The dimensions of retort houses vary, of course, very greatly. They are frequently made about 75 ft. in width and about 40 ft. in height from the lowest floor to

springing roof. The length will according to the number of retorts, a house is sometimes constructed with few to its being lengthened when the output has to be increased. A fairly large works will probably possess four or five houses, each containing, say, 150 retorts. The rules to be observed in the construction of the outer walls of a retort house are merely those to be observed in the construction of any other building of similar dimensions. Light and air is admitted through the upper part of the walls, and attention must be given to ventilation. Outside the retort house space must be left for the storage of coke.

Purifying Houses.—Gas is commonly purified by passing it through oxide of iron and lime after it has been well washed with water. The houses are usually constructed with three stages, the top stage, for storage of new lime oxide; the second stage, on which the retorts are supported; and the bottom stage, or ground floor, which receives the gas line or oxide discharged from the retorts. By the use of chutes, the purifying material is readily transferred from one floor to another. Purifiers were formerly housed in large brick buildings, but it is now a common practice to merely provide a roof and pillars supported on metal girders and columns, the sides of the house being entirely open.

Gas and Liquor Wells.—For the storage of gas and ammoniacal liquor, large tanks are required. These are commonly underground tanks or wells constructed with cement concrete or with brick laid in cement. Sometimes, however, the tanks are constructed of riveted iron plates and lined above ground. The choice of material must depend upon local circumstances.

Oil Storage Tanks.—Where carburetted water-gas is manufactured, provision must be made for the storage of many thousands of gallons of oil. The tanks to contain this oil are usually formed of riveted iron or steel plates, and are lined above ground.

Gas-holder Tanks.—The choice of material for the construction of gas-holder tanks must depend upon locality. In London concrete is perhaps to be preferred, but in some other districts brick-and-puddle tanks may be cheaper. Ground unsuitable for excavation steel tanks placed above ground on artificial foundations are now frequently used. H. E. Jones, in a paper communicated to the Institution of Civil Engineers in 1901, gave the following figures as representative of the cost of gas-holder tanks constructed with different kinds of material, presumably in the neighbourhood of London:—

- (1) A concrete tank, in 1900, for a three-lift gas-holder containing $1\frac{1}{2}$ million cubic ft., cost 5,790*l.*, or 3*l.* 5*s.* 10*d.* per 1,000 cubic ft.
- (2) A brick-and-puddle tank, for a three-lift gas-holder for $2\frac{1}{2}$ million cubic ft., would cost at the present date, in clay 1 (the most favourable), 14,700*l.*, or 5*s.* per 1,000 cubic ft.
- (3) A steel tank, for a four-lift holder for $\frac{1}{2}$ million cubic ft., constructed in 1899, cost 5,220*l.*, or 6*l.* 18*s.* per 1,000 cubic ft.

(4) A cast-iron tank, designed in 1897, for a three-lift holder for $\frac{1}{2}$ million cubic ft., was estimated to cost 8,975*l.*, or 14*l.* 5*s.* per 1,000 cubic ft., and was not carried out.

Gas-holders.—The same authority advocates the use of steel holders with untrussed crowns. When the holder grounds the crown and roof rest upon a timber stage permanently fixed in the tank. Guide framing for the upper lifts is now frequently dispensed with, while the framing for the lower lifts is of much lighter construction than formerly. Mr. Jones recommends "vertical members of rolled-joist section, strutted at short intervals by horizontal joists or girders, and braced by flat bars of steel. Thus the entire framing resembles a single lattice column large enough to enclose the holder." The heavy cast-iron columns which were formerly universally used for gas-holder guide-framing are now quite out of date.

THE NATIONAL TRUST.

THE National Trust, which held its annual general meeting on Wednesday afternoon at the Royal Society's rooms, is developing into an important power, and seems likely, if it receives adequate support in the way of funds, to realise a very great work for the nation, and more especially for future generations, in securing in perpetuity places of beauty which otherwise would almost infallibly be spoiled or destroyed for all purposes of public enjoyment. The Bishop of Southwark, who described his interest in the movement as being that of a "slum bishop," made a point in this respect in recurring to the condition of the surroundings of St. Saviour's sixty years ago, when there was a quiet oasis shaded with trees all about the neighbourhood of the church, under which his present parishioners might be now sitting had there been a National Trust existing at that time to secure the trees and the open space for them. Another question which comes into the purview of the National Trust is that of the destruction of the beauty of natural sites by the very means which are taken to bring people within easy reach of them. As Mr. Sidney Colvin said, in a speech which was admirable both in matter and manner (the speeches generally, we may observe, were quite above the usual level of oratory at public meetings), the consecration of certain scenes in the poetry of Wordsworth resulted eventually in a kind of rush to see them, which had the effect of entirely destroying the very quality for which the poet loved them; and the chairman, Sir Robert Hunter, in his opening remarks, while pointing out that the Trust took up no general position of hostility to railways, touring, and tourists, put the very crucial question in reference to the Snowdon light railway—what was the use of providing what were called easy and cheap means of transit for the public to places of natural beauty, in a manner which robbed those places of that very atmosphere of quiet and seclusion which gave them the greater part of their charm?

The National Trust, though its pro-

gramme includes places "of historic interest" as well as "of natural beauty," has so far directed the greater part of its efforts towards the purchase and preservation of natural beauty, and this partly for a practical reason. Though the Trust has been successful in getting a good deal of money subscribed for special purposes, it is not at present a wealthy body; and it appears that the places of natural beauty which they have acquired bring in a sufficient amount of return, by rents for uses not interfering with their attractions, to make the Trust in this respect self-supporting; while ancient remains, on the contrary, require a certain expenditure in keeping them from further decay. A larger revenue may make a difference in this respect, but in our opinion the Trust is doing better for the country in securing sites of unspoiled country and preserving them than in any other possible expenditure of its energies.

This question came up in a concrete form in the third and the only really important resolution submitted to the meeting. On Wednesday, as usual, three out of the four resolutions were little more than formal, giving speakers the opportunity of saying anything they wished to say in regard to the policy and objects of the Trust; but the third one proposed a larger scheme than the Trust has yet taken in hand. The resolution ran—

"That this meeting warmly approves of the proposal for the acquisition of Aira Force and Gowbarrow Fell on Ullswater by the National Trust, and pledges itself to use every endeavour to secure the required purchase-money."

This is a larger purchase than any which the Trust has hitherto attempted, and consists of some 750 acres of park and wild fell rising to a height of 1,578 ft. above sea level, together with a ravine through which the Aira Beck flows, and with a frontage of a mile to Ullswater shore. The owner wishes to sell, but has given the Trust for the present the first claim. Were the land to be sold publicly, there can hardly be a doubt that it would be utilised for building "attractive residences," and thus lose its wild character and be the occasion of intruding houses on to the banks of Ullswater. It is not so much from the desire to possess this estate, as the desire to prevent others possessing it who would put it to a utilitarian use, that the Trust urges the raising of funds to acquire it. The price is 12,000*l.*, of which only a small proportion is as yet promised, but the Trust has been so successful in other cases in procuring money for the objects it has at heart, that we have every expectation of its success in this effort also, and that we shall hear of the completed purchase at the next annual meeting.

The preservation of the beautiful waterfall, Aira Force, is another important object. Seeing that we have arrived at a time when every engineer regards a waterfall not as an object of beauty, but as an instance of power running to waste, it is necessary to look jealously after our waterfalls, or none of them will be left to us. The fate of Foyers is a warning not to be lightly forgotten; let us do what we can to preserve those that still remain from destruction.

NOTES.

The Post Office and Open Spaces. By means of a Government Bill now before Parliament, the Post Office seeks to obtain powers which will enable the department to disfigure open spaces without reference to the rights of the owners or guardians. The conservators of such areas have hitherto been able to prevent the Post Office from carrying telegraph wires across the commons, woods, and forests under their charge to the lasting injury of their charm and the destruction of their natural appearance. If the present Bill should become law, it is highly probable that such spaces as Wimbledon Common, Epping Forest, and other heritages of the people will be hopelessly disfigured by telegraph posts and wires. There is nothing to be gained by the passing of the measure in question beyond a slight reduction in the length of wire used, and we hope that all who are interested in the preservation of open spaces will unite in resisting the act of vandalism proposed by the present Government at the instance of the Postmaster-General.

Actions against Public Authorities. In these days, when municipal trading is on the increase, the case of *Sharpington v. Fulham Board of Guardians* is one of general interest. The defendants had entered into a contract with the plaintiff, a builder, to make certain structural alterations in a house with a view to converting it into a home for pauper children. The contract price was £599l., and the contract contained an arbitration clause. The plaintiff alleged that he had been delayed in the work for thirty-six weeks over the contract time owing to the action of the defendants, and to alterations and changes made in the contract by them, and he claimed 1,357l. in addition to the contract price. The work was completed in May, 1901, arbitration was applied for in April, 1902, and the matter was referred to arbitration November 25, 1902. The defendants raised a preliminary objection in law that they were public authorities within the meaning of the Public Authorities Protection Act, 1893, and that the proceedings had not been commenced within six months next after the acts, negligence, or default complained of as prescribed by section 1. The Court held that the Act had no application to an action for breach of contract brought by a contractor, a private individual, on a contract made with him and having no connexion with the public duty to be performed by the public authority. This decision is very important, since it is obvious that the Public Authorities Protection Act was framed only to protect such authorities in their executive duties, and not when they were contracting in their new commercial capacity, and, apart from the time limit, the Act contains provisions giving public authorities great advantages as to costs if they are sued unsuccessfully, which would be most unfair were the Act to apply to their contractual relations with private persons. The defendants raised a second technical defence under the Board of Guardians (Payment of Debts) Act, 1859, in which they were also unsuccessful.

Assignees of Leasehold. THE principle of limiting covenants on sale of freehold to an indemnity has had an important application to leaseholds in the case of *Harris v. Boots*. The plaintiffs were lessees of certain premises in Brighton under a lease for thirty years, which contained a clause restraining them from making any alteration or addition to the premises without leave in writing. The plaintiffs assigned their interest in the said premises to the defendants, who were also in possession of the adjoining premises, and with the leave of the lessor all the premises were thrown into one. The assigned premises proving insanitary, certain alterations were made by the defendants, amongst other things a window was knocked through. The plaintiffs therefore proceeded against the defendants for a breach of the lease and for a mandatory injunction to restore the premises. The lessor, it is to be observed, who had an interest in the property, had taken no proceedings. In these circumstances the Court held that the covenant amounted only to a covenant to indemnify—that is to say, a covenant on the part of the assignees to indemnify the assignors against any claim for damages which might be made against them by the original lessor, and the action was dismissed. This decision is satisfactory, for it stands to reason that lessees who have parted with their interest in the premises (as was the case with the plaintiffs in this case) have no wish to enter upon litigation, but may feel compelled to do so to protect the property for the original lessor. Now, unless complaint is made by the person really interested in the property, the intervening lessee who has parted with his interest need take no proceedings, at any rate in the case of breach of negative covenants.

Steam Traffic on Roads. WITH the increasing use of steam traction for heavy traffic on the roads the case of the *Attorney-General v. Scott* will be read with interest. The defendant was the owner of a quarry in Monmouthshire, and also a hauler of stone from other quarries, and pending the trial of the action now decided he had been prohibited by an interim injunction, confirmed by the Court of Appeal, from using steam traffic on the roads at all. He was indicted for nuisance, in that it was said he rendered the roads dangerous and impassable for vehicular or other traffic. His defence was that the roads were improperly maintained with a view to the character of the ordinary traffic to be expected in that district, and he alleged that since the road had been put into a proper state the remedy of perpetual injunction was inapplicable and unreasonable. There was no allegation that any provision of the Locomotive Acts had been infringed or the traffic improperly conducted, and the case rested solely on the frequency and weight of the traffic. The Court, in a considered judgment, found that the bad condition of the road was not primarily caused by the defendant, but arose from neglect on the part of the county council in maintaining it in a fit condition for the traffic to be expected, and that after the road was properly constructed the traffic would cause little or

no damage, and the injunction was refused and the interim injunction dissolved, on the defendants giving an undertaking not to resume the traffic until the reconstruction was completed. It should be noted that this question of nuisance is quite independent of the question of damages for excessive traffic, as is shown in the case of an action for damages by the Tavistock Rural District Council, in which, although a similar defence was raised, damages for extraordinary traffic were awarded.

Street Accidents. In response to a question asked in the House of Commons the Home Office have published a table of street accidents in the Metropolitan Police District known to the police. The total number of accidents attributable to motor-cars and cycles for the year ending May 31, 1904, is 1,817, those attributable to horses and horse-drawn vehicles 22,558. In these accidents the number of persons respectively injured was 640 by motors, 7,921 by horses, the fatal accidents being respectively 17 and 198. Some of the Press organs in the motor interest are making much capital out of the above figures, quite omitting the consideration of the difference in the numbers of horses as compared with motors in use in the Metropolis. Any comparison between the two classes of traction is almost childish, but during the period covered by this return we believe there were only 5,000 to 7,000 cars in all England, and to assume that there were 100 times as many horses as cars in use in the Metropolitan Area is probably to under-estimate the real number very considerably; but even on this assumption the proportion of the total number of accidents—7·4—attributable to motors, as compared with 92·6 attributable to horses, gives a very high average to motors in view of the small number in use.

Dangers from Electric Shocks. THE embellished accounts of the fatal accidents due to shocks to trespassers and employees on electric railways, which have recently appeared in the daily Press, have given many people erroneous ideas of the dangers arising from electric shocks. It may be of use therefore to consider some of the dangers arising from this cause, as unreasoning panic may often be as dangerous as foolhardiness. Suppose, for example, that the trolley wire were to break and fall on the roof of a crowded car. In the event of the safety devices not acting, there will be a wire about a third of an inch in diameter on the car at a pressure of 550 volts from the earth. If the wire is pressing against the clothes of anyone it is exceedingly unlikely that he will feel anything, and even if it touches his skin the shock will only be appreciable if his boots are damp and the car roof wet. Even then it is not necessarily fatal. In the worst case, if anyone has grasped the wire and cannot let go, it will be perfectly safe for a fellow passenger to pull him away by grasping his clothes and putting a foot on the wire to prevent it striking others. To push the wire away or keep it down with a walking-stick is a perfectly safe proceeding. On a railway with an electrified conductor between the rails an ordinarily-

clothed person falling on the conductor would feel no shock unless his skin made contact both with the conductor and the rail. In the event of it ever being necessary, it would be fairly safe to walk beside the electrified conductor or even on it, provided that your boots were not soaking wet and that their soles were sound. In this case it would be advisable to keep your hands in your pockets. The only danger consists in stumbling, and making contact with your skiu between the conductor and damp earth or a rail. It is always safe to pull at a victim's clothes. It must be remembered that a current from the high-pressure conductor will only flow through your body when your body forms a path to another conductor at a lower pressure, as, for example, a water pipe, a gas pipe, a damp wall, or damp earth. Walking beside the electrified conductor of a railway in a rainstorm without a mackintosh is as dangerous as walking on the edge of a precipice—you must not stumble, and you must not put your foot on the rail.

Dover Harbour. ALTHOUGH the east pier of the commercial harbour at Dover will not be formally opened until September, it has already been used for Transatlantic traffic. This pier, commencing opposite a point between the Wellington and Grauville Docks, is now called the Prince of Wales Pier, and extends considerably beyond the end of the old Admiralty Pier. It is worthy of note that the landing-stage on the new pier will accommodate ocean liners at any state of the tide, and that the pier itself will ultimately have a width of 245 ft. to provide still further for the requirements of the port. Railway lines have already been laid connecting the end of the pier with the shore, but we learn that a proposal is on foot to carry a viaduct direct from the South-Eastern Railway Station, next to the Lord Warden Hotel, to a point about halfway along the Prince of Wales Pier. This will leave a triangular area, between the new viaduct, the pier, and the tidal harbour, and it is probable that the area in question will ultimately be filled in to provide a site for the erection of quay sheds and other buildings.

Contamination of Water by Lead. WE have received a small pamphlet of three pages dealing with lead in drinking water, by Dr. Aspinall Marsden, lately a medical officer of health in the North of England, in which he suggests that lead, undetected or unheeded, in water, is the cause of much illness and physical degeneration, and that the matter is of national importance. The author inveighs chiefly against moorland water supplies, but he does not state his case at all clearly. We gather that his experiences lie largely in an area whence water may be drawn from lead-bearing strata. The ordinary ore of lead, galena, is quite insoluble in water, but secondary minerals, such as cerussite, produced from it, are soluble in certain waters, e.g., those highly charged with carbon dioxide. The upland lead-bearing districts in England are, however, not numerous; Alston Moor, North Derbyshire, and the North Wales coast hardly

serve as a basis for a general indictment on these grounds. If, on the other hand, Dr. Marsden's suggestion is that nitrates, often plentiful in moorland waters, exercise a solvent action on lead pipes, his strictures cover a much wider field. Reference is made to the presence of nitrates, and it is well known that waters so contaminated, especially with ammonium nitrate, have a great solvent action upon lead. No impurity (in the absence of copper) is so easily detected and estimated in water as lead, and we should have thought that the writer's experiences would have provided figures which could answer at least some of the questions he raises. One-tenth of a grain of lead per gallon can be detected directly, and this is the amount taken by most analysts as sufficient to condemn a potable water. Smaller amounts may be found by a proportionate boiling down of the sample before testing. Fortunately hot water is not usually conveyed far in lead pipes for mechanical reasons, but it is difficult to provide a substitute for lead at a reasonable cost for a whole water system. Lead pipes could be drawn with a lining of tin, but perhaps some alloy of lead might increase our immunity from the danger of poisoning. A series of experiments on this subject with waters of various compositions would be of great value, and when, after a few more decades, we have come to realise the need for a National Chemical Laboratory, perhaps such investigations may be carried out. In the meantime we might appeal to such authorities as Professor Bedson and Dr. Oliver, of Newcastle, for some popular statement as to the effect of continued very small doses of lead upon animals.

The Parish Church, St. Giles-in-the-Fields. A FACULTY will shortly be issued by the Consistory Court for carrying out some improvements and alterations in the fabric of the church. The rector and churchwardens propose to remove the monument to Chapman, the poet, and first translator of Homer into English verse, from against the outer side of the south wall of the church into one of the vestibules. Thomas Habington, in his poem "Castara," published in the year (1635) after Chapman's death, refers to Chapman's grave outside the (old) church. The monument bears two Latin inscriptions, whereof one is a copy of the original—the date has recently been corrected—that seems to have been cut upon a fresh slab inserted into the monument as erected by Imigo Jouis to his friend—

GEORGII CHAPMAN POETA
MDCXXXIV. IGNATIUS JONES ARCHITECTUS REGIUS OB HONOREM BONARUM LITERARUM FAMILIARI SUO HOC MON: D.S.P.F.C.

The concluding letters we take to signify *de sua pecunia faciendum curavit*. The lower inscription records the restoration of the monument (in 1827), when it was protected with a hood formed of two stones placed at an angle. The faculty will authorise the separation of a part of the south aisle as a side-chapel, with a screen and a second holy table, and an exchange of the positions of the Bishop

Patteson memorial window in the north gallery, and the present east window, which forms a memorial to Dr. J. Endell Tyler, rector, who, with the churchwardens, restored Chapman's monument. The monument is in the form of a stele, rising to a total height of 5 ft. 5 in. from the ground; the base, 29 in. wide, stands 25 in. from the wall, and the top portion consists of a carved finial now much weather-worn.

The Soane Museum. WE are glad to announce that Mr. Walter L. Spiers has been appointed Curator of the Soane Museum as successor to the late Mr. Birch. Mr. Spiers assisted in the work during Mr. Birch's illness, and found it of so much interest that on the lamented death of the late Curator he determined to apply for the appointment, undertaking to give up any other professional work if appointed. Mr. W. Spiers was educated in the Engineering Department at King's College, London, and subsequently in the office of his brother, Mr. R. Phené Spiers. In the Architectural Association, which he joined in 1866, he gained the first prize in the Class of Design, and Sir W. Tite's prize for a design for a town church. He passed the voluntary examination for membership of the Institute of Architects in 1870, and obtained a silver medal for measured drawings of Eastbury Manor House in 1873. He subsequently qualified and was appointed as a district surveyor, but has given a great deal of time to the kind of research which is specially desirable in a curator of a museum. The appointment is a very good one, on which we may congratulate both Mr. Spiers and the Soane Museum Trustees.

ARCHITECTURE AT THE ROYAL ACADEMY.—VI.

THE decorative works in the architectural room, although not so numerous as in recent exhibitions, partake largely of the nature of memorials. Contrary to anticipation, the designs for sculptured monuments are few and of no great public interest, except the Queen Victoria memorial, which we have already noticed. Of the remaining exhibits, Mr. Reginald Blomfield's "South African War Memorial, at Halleybury College" (1,558), is the most prominent. The design consists of a large obelisk rising from an ornate base, the four sides of which are convex, and terminate in large carved consoles, whilst the whole stands upon a flight of circular steps. The names of battles are placed upon small metal shields on the lower part of the obelisk, and an inscription is cut in a large carved trophy in each of the sides of the base. The drawing, which is made by the author, is excellent, in spite of the tall tree behind the subject, having an angry movement; the design has merit in its XVIIIth century aspirations, but the base is perhaps over-wrought with carvings, the simplification of which would have added to the dignity of the composition.

No. 1,490 is a "Competitive Design for Memorial Tower, Allahabad," by Mr. M. S. Hack, a very ordinary conception of no value to this exhibition. Plans are wanting, but we see sufficient to convince us that this tower will not construct as shown.

We are inclined to the opinion that a XXth century war memorial should primarily indicate the period of the incident intended to be immortalised. This is not the direct purpose of No. 1,524, "War Memorial to Old Cliffonians," designed by Messrs. Paul and James, with whom is associated Mr. A. Drury, A.R.A.; for it is seen that a heavy base with much XVth century Gothic detail, upon which stands a small armoured figure, presumably St. George, is obviously an attempt to harmonise the

monument with its earlier surroundings. A very good design for a mural monument is given in No. 1,632, by Mr. J. J. Shaw, to be executed in green and black marbles. A large central recess contains a white marble sarcophagus, embellished by a chain of metal wreaths and festoons, whilst figures of youths in the act of watching, are placed in smaller side niches. The idea suggests dignity and solemnity.

The majority of the designs for commemorative works, however, take the form of stained-glass windows, all very small in size, and not one of the drawings bears a scale or any other information to direct the imagination in studying these coloured reproductions. No. 1,479 is a square-headed window with a transome, in which the subject of St. George is introduced with an heraldic panel in the lower part, and the whole is enclosed within a foliated border. Mr. J. W. Lisle's colouring and composition are the two chief factors in this excellent design.

"Sketch for an East Window, Church of St. Ignatius" (1,516), by Mr. P. Woodroffe, is a distinctly clever handling of an early geometric style of glass, such as is found at Chartres. The *motif* of the design is seen in the series of elaborated quatrefoils set in an interlacing vine grisaille. The principal panel contains a figure of Christ in Ascension, and a connected arrangement of lines and colours appearing in all the central spaces, each of which has a subject, gives cohesion to the design, an element invariably absent in this kind of work. This is a good drawing of a most interesting window. "St. George" is the popular subject of decorative artists and re-appears in No. 1,518, which is a "scrap" of glass design, by Mr. H. Arnold. Here the colour is confined to the figure exclusively, which stands out as a large spot; a slight use of colour in the ground would carry off the hardness of such an arrangement to the benefit of the whole lancet, of which this drawing forms a part. No. 1,604, by Mr. J. D. Forsyth, is a six-panel, three-light traciced window; each of the three upper spaces contains single allegorical figures surmounted by canopies, while the lower spaces have groups of figures representing arts and sciences. The colours are somewhat crude, although the work is carefully drawn; but no window can stand two distinct scales in its figure treatment. A Renaissance feeling is given in No. 1,606, a square-headed window, by Mr. J. Pfelan, in which a figure of St. John is standing upon a kind of pedestal, surrounded by an arch-and-pilastered border. The natural attitude of the subject is unsuited to the conventionality of its setting, and the scale of the respective parts is unhappy. In No. 1,635, the same author reverts to tradition in canopied design, and is more successful.

Mr. W. Aikman sends a drawing of a window for "All Saints' Church, Blackrock" (1,636), in which the principal figure is clad in a rich, red robe. A dark green background is introduced, from which rises a "tree-stem" design, terminating with angels in the apex; the general effect should be very satisfactory.

No. 1,644, by Mr. G. Parlyb, is one of the most beautiful drawings which have been hung in the Academy in recent years. It is a two-light traciced window, in which the subject of "The Annunciation" is most carefully and minutely indicated in a pre-Raphaelite manner. The colour scheme is excellent, and there are innumerable interesting and delicate accessories. The drawing, however, suggests a decorative painting more than conveying the impression of a work executed in leaded glass; the slight confusion of the design, therefore, would be accentuated by the constructional lines of the glazing. A contrast is seen in the roughness of the sketch for a single light window, No. 1,643, by Mr. O. E. Prest. Here is a figure of a bishop contained within a border consisting of an intertwining tree growth, twisted into various forms of cusped tracery. This kind of thing is not to be desired.

The decoration of interiors does not find a large place on the walls, and there is not one example of the complete treatment of a building. Although "The Salon of an Orient Liner" (1,463), by Messrs. Stevenson and Reelfern, is shown in an indifferent ink drawing, there are indications that colour is intended, as well as an extensive use of wood fittings. There is room for improvement in the design of most ship interiors, and this is quite an advance, worthy of a better drawing. No. 1,605 is "Hall Ingle in a Riverside House,"

the title given to a highly-coloured interior, designed by Mr. L. Wyburd. The scale of the furniture is very small in proportion to that of the apartment; or the hall is very high, and the timbers terrific. Resolved into present day terms in furnishing, this design is "a quaint note." The preliminary sketch for the decoration of the central hall at "St. Paul's (Girls' School," by Mr. E. J. Lambert (1,641), is the kind of subject of which we could wish many more examples. The drawing shows the colour treatment of the barrel-vaulted ceiling of the most important part of the institution, and a very good scheme is indicated. By way of criticism we should say that, whereas most of the coloured designs are subordinated to the spaces occupied, the composition in the main tympanum and indeed the architecture of this end of the hall would gain considerably if the large painted subject received a more formal arrangement. This drawing probably loses value by its perspective view; elevations, and perhaps a key-view, would be more satisfactory.

There are two exhibits which, in view of the conservative character of these annual exhibitions, appear to be out of place, or is it possibly a sign of better things? No. 1,493 is a decora-

tive coloured panel, by Mr. Alexander Fisher, representing St. Veronica. Groups of figures in flat relief are arranged about a Byzantine colonnade, making an interesting design, but it is placed much too high up to appreciate, and is more suitable for the Sculpture Galleries. In Gallery No. V. Mr. E. A. Abbey, R.A., shows a design for a Crucifixion, already mentioned, in which the coloured figures are conventionally treated and placed upon a gilt background. The panel is intended for a retdos in the Church of the Holy Trinity in Paris (361), and is instructive as indicating the sound ideas of decorative work of this great painter. But its right place is with the works in architecture, and not mixed with the pictorial reproductions of things natural. The size of the work, however, appears to have shown the hanging committee that the small chamber at disposal would not conveniently contain it.

This concludes our reviews of the drawings, etc., which illustrate architecture at Burlington House, and we are forced to summarise in the same strain as on past occasions. The practice of the architect is a wide-reaching process, and it is only necessary, in order to realise this,

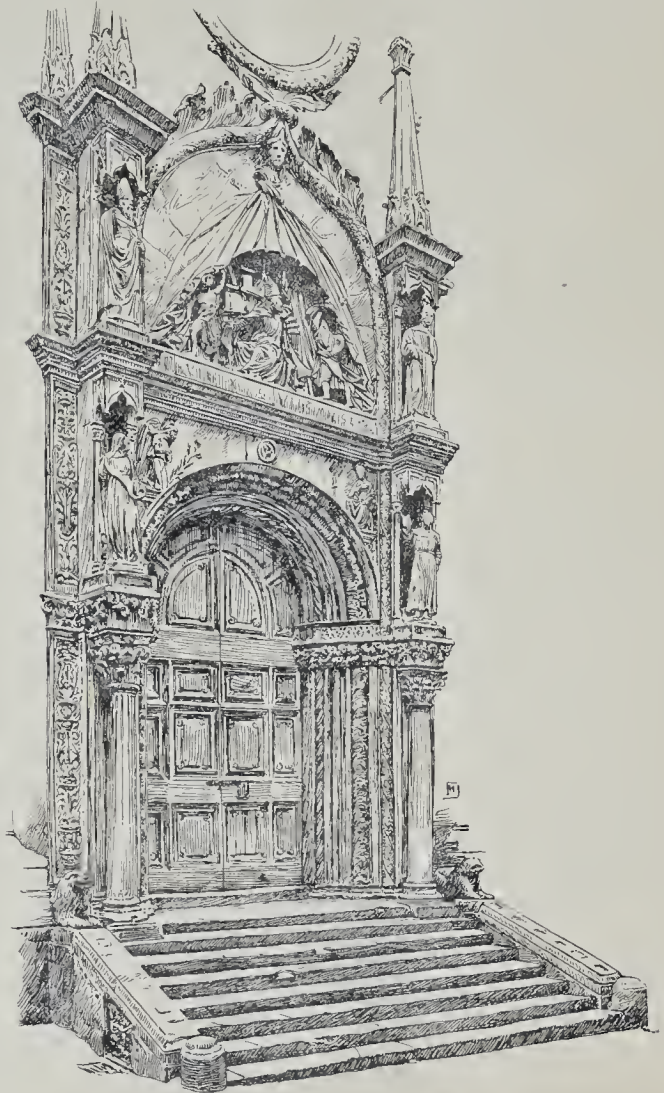


Fig. 1. Doorway, S. Agostino, Ancona.

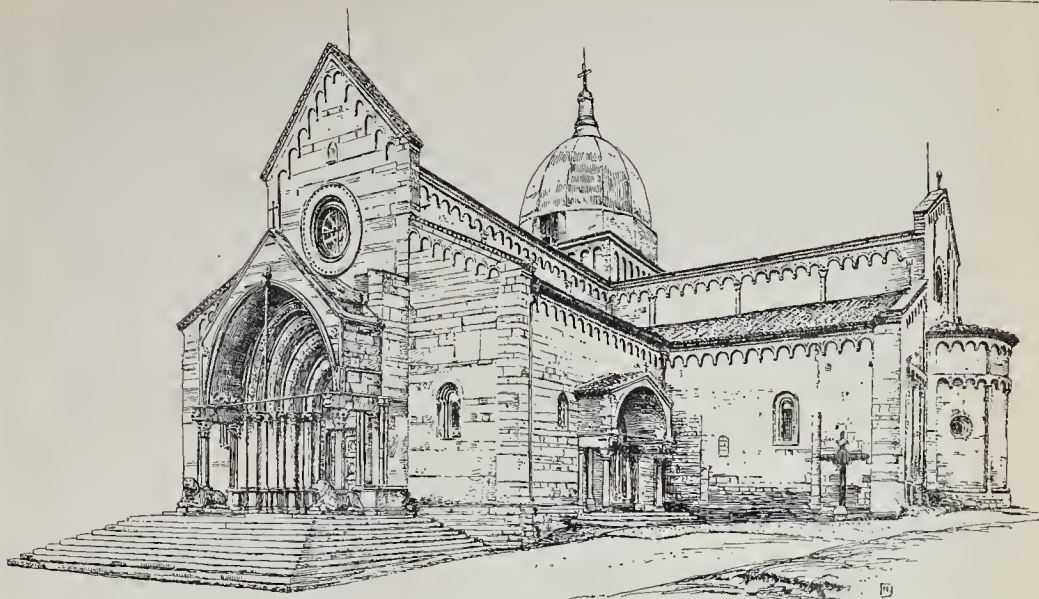


Fig 2. S. Ciriaco, Ancona.

to glance at the variety of subjects submitted in the architectural room. There is no encouragement for *grands projets* or works in any degree comprehensive, which are proportional to our national greatness; on the contrary, we find a limited selection in scraps of churches and cottages, in stained-glass and street fronts, banging haphazard, as if by a kind of gracious indulgence from the painting authority in whom is vested the destiny of a living British art.

NOTES AND SKETCHES IN SOUTHERN ITALY.—I.

ANCONA.

ANCONA is the capital of a province and has a fine harbour. Its population is considerable, containing a large proportion of Jews; according to Biedeker, 6,000 out of 28,000, but Amati gives the figures as 2,000 and 32,000 respectively. It lies on the lowest slopes of Monte Conero, the Comerus or Cumerus of Pliny, between the promontories of Monte Astagno and Monte Guasco. From the summit of the latter the Cathedral S. Ciriaco overlooks the town and the harbour, standing on the site of a temple of Venus, which is mentioned by Catullus and Juvenal, while the other horn of the semicircle is occupied by the citadel. Below this is the lazaretto, built in 1732, a pentagonal fort with a drawbridge, now utilised as a bonded warehouse. The northern pier is fortified with two batteries, and is of Roman construction. At the beginning of it rises the triumphal arch erected in honour of Trajan in 115 A.D. by the Roman senate, said to have been designed by Apollodorus. It is Corinthian, narrow and lofty, built of Parian marble without mortar. It was once adorned with trophies, inscriptions, an equestrian statue of Trajan, and statues of Plotina and Marciana, his wife and sister; all these were removed by invaders in the Vth and Xth centuries. It is approached by steps and railed round. Beyond is another arch by Vanvitelli, which faces towards the sea. It stands on the continuation of the Roman pier, which was made by Clement XII.

The streets of the city are narrow and winding (except in the new part, which is more interesting to the inhabitants than to the traveller), and every now and then steps are made use of to conquer the steep more rapidly. The Palazzo Comunale was built about 1270. Margheritone of Arezzo made the design, and from the street below a good deal of the hack part may be seen such as he left it. The facade and interior were altered in the XVth century by Francesco di Giorgio, and modernised in 1647. On the facade is a quaint relief of Adam and Eve of the original period,

and others remain at the hack. Within is a XIVth century statue of Marco de' Rossi, the legist. A little lower down a piazza has at one side an interesting facade of the same period. The Prefettura has a fine court with Gothic arcades, through which the street passes. The pointed arched gateways (which still have the chains used to block the street hanging by them) have been recast in Renaissance times with fluted attached columns, and other pointed arched openings have been disguised by additions in the same manner. The windows on the first and second floors have graceful arabesques on their friezes, and the machicolations beneath the cornice have been adapted as a decoration. The church of S. Francesco (now a barrack) has a very fine Gothic portal attributed to Giorgio da Sebenico, and so much resembling the Gothic work of Istria as to make the attribution probable. The church of S. Agostino (now also a barrack) has a striking doorway of similar style with a curious mixture of Renaissance detail (Fig. 1). Another building of the same character is the Borsa, called the Loggia de' Mercanti, built in 1459. The XVth century Palazzo Benincasa adjoins it. There are several late Renaissance churches, among which is one with a rococo spire, which is oval in plan, and has a spirally ascending arcading as decoration, giving it the strangest and most unstable appearance. An early Renaissance door of the church of S. Maria della Misericordia is rather over-rich, but pretty.

The most interesting buildings in Ancona, however, are the Cathedral (Fig. 2) and the church of S. Maria della Piazza. The facade of the former is ascribed to Margheritone, but there are many fragments of an earlier period worked up into the structure, without counting in the ten antique columns of the interior (the dedication was to S. Lorenzo until the Xth century). The dodecagonal cupola is believed to be the earliest and one of the finest in Italy. It was filled with scaffolding and undergoing restoration, so the writer has no opinion on the point. The plan is a Greek cross, each of the arms being flanked with aisles. The nave arcade is round arched, with buttress slips above each column. A dentilled cornice crowns the whole wall, and a string separates a blank clerestory space from the arcaded portion. The wooden roof is like that of S. Zeno, Verona, in shape, and is painted blue and white with yellow rosettes in each square. In the right transept there are three queer flat and shallow Ionic caps, with a heavy ornamented block above, and a cushion ahaeus above that which is moulded at the top and bottom, but otherwise plain. These appear to be of the IXth century, and much resemble some figured by Cattaneo.

There is a crypt below each transept, and on the right is a fine parapet wall with panels bearing incised designs, relief being given by the ground being tooled hack for a space. There are four slabs on one side, with storks, an eagle, peacocks, and griffins respectively, the first facing each other on each side of a pomegranate tree, the second clutching a rabbit in its claws, the third with a poplar-leaved tree between them, and the fourth with branching conventional lilies and a central stem. The design is striking, though the execution is rough, and is probably copied by local carvers from Byzantine originals. On the other side figures stand in couples beneath arches—three couples and one single figure, the background being inlaid with reddish marble. Apparently this parapet wall was remade in the XIVth century, to which period the framing and the figures appear to belong. In the crypt below are many interesting sculptured fragments of various dates—a XIIth century relief of Christ between symbols of the Evangelists, signed Phibippus; three XIIth century statuette, probably from the left transept, the sarcophagus of Titus. F. Gorgonius, praetor of Ancona; a IVth century work with reliefs of Old and New Testament subjects; the sarcophagus of S. Marcellinus, a statue of S. Primitianus and other fragments, both of architectural and figure sculpture. The crypt of the left transept has been modernised in the baroque style. Here are the tombs of SS. Cyriacus, Marcellinus, and Lihorius.

The facade has a beautiful porch with griffins, one holding a ram and the other a serpent. The drawing gives a general idea of the design of the church. The south door is largely made of earlier fragments, and probably a good deal of work was done in the XIVth century, using up material of an earlier period. Many flat reliefs are incrustated in the facade, and pieces of grey cipollino applied for decoration without constructional value. Close by is the campanile, and at the other side the archbishop's palace, where Pius II. closed his weary life in the consciousness of failure in 1464. He provided his blessing and indulgences in plenty for the crusade against the Turks which he had preached, but neither money nor arms.

The church of S. Maria della Piazza has a facade of 1210 with much carving by Philipppus; a central round arched doorway with elaborate archivolt (Fig. 3) and rows of arches across the whole facade. At the side is a pointed arched doorway and a round arched corbelled cornice, which also occurs at the summit of the nave wall. The proportions have been altered by Renaissance additions. In the wall of the facade, behind the arcading, are some pieces of interlacing inlaid work with gilded tesserae still

adhering, which seem to show an earlier use of them in this connexion than is generally allowed. The springings of arches in the main piers show that there was once a porch. The *scodelle* under the first row of arches are coarsely painted majolica of late date. This façade now so much blackened by age was built of white and pink marble.

The origin of the town is lost in the mists of antiquity. Pliny says it was founded by the Siculi fifteen centuries before Christ, Strabo that it was founded by Syracusans flying from the tyranny of Dionysius about 400 B.C. The name is derived from the Greek *αγκων*, an angle, referring to the shape of the coast. It became the capital of Picenum, and fell under the power of Rome in 268 B.C., when it was made a colony and an important maritime station. Besieged by the Goths under Totila, it was succoured by Belisarius (551), and became the principal city of the Pentapolis under the Greek Exarchs, but was afterwards conquered by the Lombards. It was given to the Pope by Charlemagne on the destruction of their kingdom. In 839 the Saracens burnt it. In 1068, remembering that damage, it joined the Normans. Nicholas II., therefore, anathematised it, but removed the curse at the intercession of S. Peter Damian. It was attacked in turn by the troops of the Church and of the Emperor, and in despair put itself under Emanuel Comnenus for forty years, from 1143. It was twice besieged by Frederick II. during this period (1167 and 1174). In the latter siege a widow named Stamura showed great bravery, setting light to the war engines under a shower of darts and stones, and apparently escaping unhurt. Ancona ceased to have relations with Constantinople after the signing of the peace of Constance between Pope and Emperor. It was the capital of the March and the residence of the Marquis. In the defeat of Ostino (1245) it lost the carroccio and its conductor, Marcellino Peto, and, remembering this, it took up the Angevin cause when the opportunity came. Sometimes Guelph, and sometimes Ghibelline, it flourished until 1532, when it finally became part of the States of the Church under Clement VII. At this time the governor, Bernardino della Barba repressed a slight rising with a large force, entered the public palace, and threw from the windows all the documents, ordering them to be burnt, an act of barbarism paralleled by that committed at Messina by the Spanish viceroy, Don Francesco Bonavides in 1678. The next governor founded the fortress, beheaded five principal citizens and exiled sixty-four, after which quiet reigned, and the city was described as *civitas fidei*! The French Revolution brought another siege, and, though it returned to the Pope and was made a free port, it suffered yet two others, one in 1849, when Zambecari defended it for eighteen days against the Austrian General Wimpffen, and

the other in 1860, when Lamoriciera and the pontifical guards were assailed by the Italians under Fanti and Persano. F. H. J.

MAGAZINES AND REVIEWS.

In the *Art Journal*, in an article on "The Art Annals of Liverpool," we are glad to see tardy justice done to that remarkable animal painter William Huggins, who went through life hardly known or appreciated in his native city or elsewhere. As the writer of the article (Mr. E. Rimbault Dibdin) truly says, he was incomparable as a draughtsman; his colour at his best was exquisite, and Landseer never drew a lion as he did." We remember one picture, a coloured crayon study of a lion walking away, his great head and mane turned round to the left, which in action and drawing was a perfect masterpiece. But Huggins seldom painted large and important oil-pictures, and that was probably one reason why he remained comparatively unknown, while such a far inferior and comparatively commonplace animal painter as Ansdell imposed himself on public notice by the large size of his canvases. An article signed "E," on the work of Mr. Lionel Smythe, we are in entire sympathy with, and the selection of illustrations is good and very representative of the work of this poetic and suggestive artist.

The *Magazine of Art* contains an article on a Belgian artist unknown to us, Herr Leempoels, who appears to be a painter with a certain original walk in art, in the creation of what may be called symbolic pictures—groups representing abstract ideas, such as "Hymn to a Family," "Friendship," etc. An article on "The present school of decoration in Germany" is very favourable in tone, but then the examples selected are also far too favourable to be regarded as really representative, by those who are acquainted with the eccentricities of furniture design constantly to be seen in German illustrated art publications. In an article on "Sculpture at the Royal Academy," the Editor observes quite truly, while doing justice to the great ability displayed in this year's sculpture, that the Academy has no space in which to illustrate adequately the real merit of contemporary British sculpture. Why Mr. Gilbert's grotesque head called "The Mother of the Ninth Symphony" should be singled out for special praise along with Watts's "Physical Energy," we do not understand. The odd and grotesque are out of place in sculpture, and the "Ninth Symphony" should have suggested something noble rather than grotesque.

The *Berliner-Architekturwelt* is largely occupied with illustrations of the architectural designs in the Berlin Art Exhibition of this year. Among these there are the usual designs for mysterious conceptions only destined to be carried out on paper—a "National Hall"

and two "Grab-Mäler"; but there are also designs of a more reasonable character. Among these Herr Kühn's "Ladies Seminary for Honnef," a domestic Gothic building with a stone ground story and white rough-cast over, is very pleasing; so, in another and rather ostentatiously simple style, is MM. Jansen and Müller's "Girls' School at Essen," but we should imagine that it was inadequately lighted. Herr Schwegken's design for the tower approach to a steel bridge fails, as so many structures of this kind do, for lack of simplicity, though it is not so weak and florid as our Tower Bridge structures. The new architectural gallery of the exhibition, designed by Herr Schweitzer, of which an interior view is given, is a really artistic piece of work, founded on Greek forms, but with some novel treatment in detail. The number is preface by a critical article on the art exhibition, written by Herr Swarzenski, of which the following is a summary. He commences by remarking that in a collection of 2,171 exhibits there can be but a small percentage of important or interesting works. In this case there is a predominance of the class of work that displays real talent and earnest endeavour, but has not sufficient greatness to rise above mediocrity. The exhibits are representative of all branches of creative art, although paintings predominate. Among these the most important are undoubtedly those by the late Franz von Lenbach, and by Ludwig Dill, whose works are classed together; the former is represented by several of his finest portraits, and the latter exhibits characteristic landscapes in soft brown, green, and grey tones. Oscar Frenzel too is distinguished by his understanding of German landscape, which he interprets best under the warm golden light of sunset. Of subject pictures there are several worthy of note, such as those of E. Dettmann, O. H. Engel, Müller, Schoenefeld, and a small pastel entitled "Adam" by Stassen. Among the sculptors Berlin is most widely represented, and besides well-known artists, such as Manz, Schauss, Hosaeus, several younger sculptors are noteworthy. Such are Jaekle and Schmarze, Ernst Müller, Helene Quittman, and C. Starck. The selection of pictures exhibited by foreigners seems a strange one. Belgium is represented by Courtaens; three Dutch artists have gained admittance, Gari Melchers, H. M. Mesdag, and Mesdag van Honten, and there is also a collection of Spanish works by Sorolla y Bastida. Besides these there is a variety of Hungarian paintings, mostly of small interest or merit. The pencil studies and illustrations in black and white show much that is good and praiseworthy, but the most satisfactory exhibits are to be found in the new architectural gallery. In general, the tendency of the architectural exhibits is towards the ideal, or merely the external aspects, and the fuller details of ground-plans, elevations, or models have been somewhat overlooked. This, however, thinks Herr Swarzenski, is in keeping with the character of the exhibition, and is therefore to be commended; a conclusion, in which, however, we can hardly concur.

The *Architectural Record* (New York) contains the continuation of Mr. de Kay's illustrated article on "Bronze and Iron Decorations," commenced in the June number. The illustrations are of very varied merit. Some of them, such as the doors of the Maryland State Building, the railing for the Newport Exchange bank, and the two playfully-designed fire-dogs by Mr. Linder, with little nude boys grouped with them, are very original and effective. Other designs show a total want of feeling for the material; the metallic window frames on pages 42-43 look exactly like wood carving, and would be taken for it but for the title, and the spray of "hammered iron work" by the Rempis Co. (page 41) is a piece of naturalism in iron of the worst type. No criticism on the illustrations seems to be attempted in the article. A paper on "What is Civic Art," by Mr. Herbert Croly, is partly a reply to one Mr. C. Mulford Robinson, who seems to have published a book or pamphlet on the subject, and to have maintained the very erroneous idea that civic art is something produced for the glorifying of the city or State and not for the sake of art. In that case, it will be likely to be more civic than artistic. Mr. Croly's remarks on the present state of American public art are judicious and interesting:

"Whether an American New York can be obtained only at the price of good looks remains to be seen; but at least we should not fall into

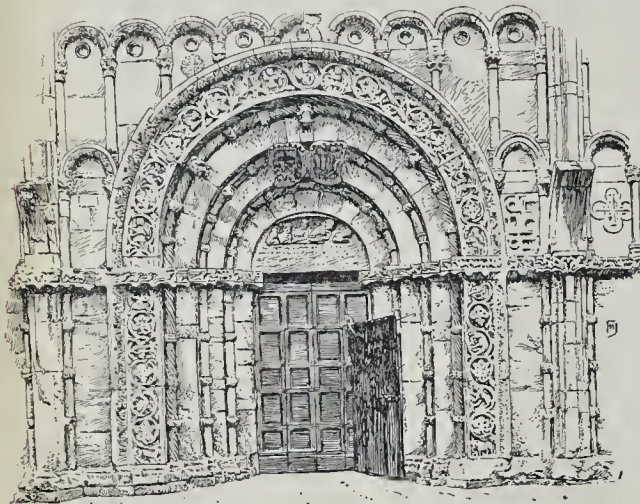


Fig. 3. West Door, S. Maria della Piazza, Ancona.

the naïve error of seeking to make either a consummately beautiful or a consummately American city merely by the magic of intelligent effort. A great city cannot be forced to bloom beautiful. Its comeliness must wait on the concurrence of a number of rare and happy conditions. The art which is capable of making a consummately beautiful city must possess more than intelligence, good taste, and complete information. It must be a mature art, guided by authentic conventions, fertile in great designers, possessed for a passion for propriety and beauty of form, and confirmed by genuine popular appreciation, in every respect the master of its resources. We have plenty of clever and well-informed architects, painters, and sculptors in this country and some few great ones, but it must be recognised that American art is mature only in spots, and that it should be in no hurry about attempting to rear a series of great municipal and national monuments. American art is not as yet guided by authentic conventions. Its methods are experimental."

It will be seen that Mr. Croly is a saner critic on American art than some of his countrymen. The *Architektonische Rundschau* gives for its first illustration a really charming design, the *Ratbaus* for Ober-Scheneweide, by MM. Altgelt and Schweitzer. It shows a façade in a free classic style, but with a good deal of mediæval feeling about it, part of the charm of which consists in the unexpected manner in which a generally symmetrical treatment is slightly varied in detail; the towers at each extremity of the front, for instance, are identical up to the balustrade, but the lanterns on them are of different height and design. The graceful arcaded loggia in the centre of the upper story contrasts admirably with the plain treatment of the rest of the openings. Altogether a piece of architecture at once refined and picturesque. There is nothing else of special interest in the illustrations, but the text includes an article on the public fountains of Constantinople ("Die Brunnen Konstantinopels") by Herr Freiber von Tettau.

In the July issue of *Technics* several articles will be found which are of interest to our readers. Mr. Joseph Horner deals with "Modern Methods of Steel Casting," illustrating some strong and weak forms of commonly recurring castings, pointing out the differences necessary in the design of a frame for cast-iron and steel respectively, and giving other hints that should be of service to the draughtsman. Mr. Harold Busbridge, in a short contribution on "The Shrinkage and Warping of Timber," presents some very practical notes with eleven drawings, making clear the characteristics of different varieties of timber and the effects following different methods of cutting logs into planks. "A New Process for the Protection of Iron and Steel from Corrosion" is described by Mr. Sherard Cowper-Coles. One point of particular interest about the new process is that the metal can be coated with a thin even deposit of zinc at a temperature many hundred degrees below the melting point of zinc. The first step is to free the iron from scale and oxide by dipping in an acid solution or by the use of a sand blast; the next is to place the objects in a chamber charged with zinc dust, which is heated for a few hours and allowed to cool. On opening the chamber the articles are found to be coated with a fine homogeneous covering of zinc, the thickness depending on the temperature and the length of exposure. Mr. E. Flander Etchells, in Part VII. of the "Theory of Structural Design," considers moments and the nature of units in a manner that should be helpful to those desiring a thorough grasp of the inner meaning and true import of constants employed by the structural engineer. In addition to the foregoing, mention should be made of the following articles—"The Radiation and Emanation of Radium," by Professor Rutherford; "Limitations to the Use of Storage Batteries," by Mr. H. M. Hobart and "Electric Traction," by Mr. R. Borlase Matthews. The useful character of this magazine is well maintained in the present number.

In *Public Works*, Sir W. Willcocks contributes an article on the interesting subject of "Egyptian Weirs or Regulators," including both the old and the new Nile barrages, with numerous sections. An article by Mr. J. F. J. Reynolds on "The Improvement of Traffic facilities in London," fills us with dread lest any municipal government should be tempted to carry out these suggestions. We are shown sections of "a new Thames Embankment," double-decked, with an upper roadway for motor omnibuses and other traffic carried on walls and steel supports above the present roadway, and a "typical crossing of an existing

street," with two stories of ugly girder bridges one over the other. The effect of such a system would be to choke all our street views and to render all fine architectural effect in London impossible. Does it ever occur to those who suggest this horrible disfigurement of our cities that there may be even more important considerations in a capital city than getting across a street in the easiest and quickest manner, and that a little crowding and delay may be a lesser evil than disfiguring the whole architectural aspect of a city?

This month's issue of the *Century* is worth getting by architects, for the sake of this description and illustrations of "The New West Point," the great reconstruction of the United States military Academy which is to be carried out from the designs of Messrs. Cram, Goodhue, and Ferguson, of Boston, the architects whose plans were selected in competition. This is really a fine and a very novel architectural conception; the treatment of a military school as a kind of great fortress, with something of mediæval reminiscence about it, though not a mere imitation. The competitors were instructed to keep their designs in sympathy with the existing buildings of the Academy, the most important and distinctive of which had been designed in the Gothic style; the point is exceedingly well put in the following quotation from the official Report on the subject:

"It is not desirable that any scheme should attempt to sweep the field clean and destroy architectural associations made honourable by generations of great men, while it is of the highest importance to preserve intact the structural sentiment which gives character and individuality to the Academy. It would be a great pity to make such a competition the subject of an architectural thesis in which the heritage of the past plays no part."

In the *National Review* Mrs. Ady writes a short memorial article on Giovanni Costa, bringing out very well his character both as man and artist. It is a great pity that this kind of appreciation of so remarkable an artist should have only have become general in this country after his death. Mrs. Ady dwells with emphasis on Costa's close and devoted study of nature and natural fact. "The Italy that he paints is not the conventional Italy of Claude and Poussin." Quite true. But, on the other hand, can it be said that Costa achieved as broad and elevated a style as that of Claude and Poussin at their best? There are more ways than one of looking at this question of natural fact in painting.

In *Longman's Magazine* Mr. C. L. Eastlake writes an article on what he characterises as "The Misrule of Imperial London," in which he draws attention to a great many inconveniences which are tolerated in London through mere want of efficient policing. As he says, "one of the most aggravating sources of offence to law-abiding citizens is ineffective legislation"; and he gives a good many examples of this, the truth of which will be but too readily recognised by every Londoner. Other inconveniences arise from a total want of common-sense in providing for obvious duties which are left to chance and charity. The sweeping of the crossings is a flagrant example:

"Whose business is it to keep them swept? The duty is at present undertaken by an army of irresponsible men and boys who, picketed at innumerable corners all over the town, stand holding their brooms and touching their hats to any pedestrian who is likely to spare a 'copper.' In wet and muddy weather they certainly render some service, and no conscientious foot-passenger likes to ignore it if he has a penny at hand. Now, supposing such a person in the course of a stroll goes over fifteen crossings and comes the same way back, his walk, if he is a liberal man, will have cost him half a crown! Of course no one actually incurs this expense. But as a matter of principle one crossing-sweeper deserves his fee as well as another. If they are paid at all, they ought to be paid uniformly. Sometimes an unsophisticated ratepayer asks why the parochial or metropolitan borough authorities who are supposed to keep our roadways clean do not extend that duty to street-crossings. The taxes levied for these and kindred purposes have increased enormously of late years, but if they do not suffice for their object, few householders would object to an additional charge of a few shillings if it would relieve them from an irregular and troublesome demand for daily gratuities."

This absurdity of the begging crossing-sweeper is a perfect disgrace to London. For our own part, we steadily refuse ever to give anything to a crossing-sweeper, because it is fostering a

ridiculous system. We recommend Mr. Eastlake's article to the attention of the London County Council and the City authorities.

The *Gentleman's Magazine* contains the rather surprising incident of a long and detailed architectural criticism of the Westminster Cathedral, signed "F"; from internal evidence presumably not the work of an architect, or the Byzantine capitals of the chapels would not have been described as "barbaric"; nor would the tower have been criticised as "chimney-like" without any reference to the refining effect of its entasis. It is odd that, in describing the columns of the chapels, the writer is enthusiastic about entasis, and the life it gives to "the inert and almost dead column"; yet he never notices the same effect in the tower. There is, however, reason in some of "F's" criticisms, especially in his remark as to the effect of brickwork on a great scale lying very largely in large and unbroken masses; and he does full justice to the interior of the building. It is something to find that an editor of a general magazine will admit such an article at all.

Knowledge contains an article by Mr. Walter Mander on the interesting subject of "The Solar atmosphere at different levels."

CEMENT BRICKS.

On Monday last a demonstration was given, at the works of Messrs. J. Hebblethwaite and Sons, Stanhope-street, N.W., of a machine for the manufacture of bricks from cement mortar. Both the apparatus and the method are particularly simple. The machine consists of an iron frame provided at one end with a rectangular box, divided into two compartments, the bottom of each being formed by a loose board, supported by a frame attached to the upper end of a mechanical movement, through which vertical motion is imparted to the board. Thus the bottom of each compartment can be raised to the level of the top edge. One side of the rectangular box, as well as the diaphragm parallel thereto, is slotted vertically in such manner as to permit the entrance of parallel knives, which are moved horizontally by means of a lever, and in their final position they divide the two compartments of the rectangular box into ten compartments, each of the size of an ordinary brick. The process of brickmaking may be thus briefly described:—

(1) A supply of mortar, in the proportion of one part Portland cement to three parts sand, is mixed near the machine; (2) the compartments of the rectangular box are filled with mortar, which is well rammed in so that the corners may be thoroughly filled; (3) the horizontally moving knives are drawn into their final position, cutting the mass of mortar into the form of ten bricks; (4) the knives are drawn back to their original position; and (5) the lever raising the movable bottoms of the compartments is operated, and the bricks are thereby brought out of the mould and can be carried away to await setting. As the result of our examinations, we are in a position to say that any ordinary labourer could make a large number of bricks daily after very little practice, and at a cost per thousand that would compare favourably with good stocks. It is not quite clear, however, what advantage is to be derived from the application of cement in the form of bricks. If the object be to build walls, it would be far more economical to use concrete, which is much cheaper than cement mortar, and can be filled into moulds with far less labour than that involved in the laying of separate bricks in courses. In some special classes of work, bricks may be preferable, and if our readers think them essential, they will probably find the apparatus here described to be both practicable and serviceable.

THE POWELL WOOD-PROCESS SYNDICATE.—This company, who are the patentees of the method of treating timber known as the Powell or Sugar Process, have taken premises at Carpenter's-road, Stratford, E., where they are laying down the necessary plant to work the system. The plant consists of tanks to contain the solutions, a cylinder in which the timber is treated, and drying-rooms to which the timber is taken after treatment. The plan of drying adopted is the hot-air system, with circulating fans. Among the advantages claimed by the patentees for their process are that it enables timber to be seasoned rapidly without splitting or cracking it, and affords resistance to dry rot, and other forms of decay.

THE ARCHITECTURAL ASSOCIATION
SUMMER VISITS:
IV.—WINCHESTER.

No place is more closely associated with the history of England of all ages, or more instructive in the evolution of British building styles, than the city of Winchester. Little wonder is it, therefore, that the visit of the Architectural Association to this ancient borough on Saturday, the 9th inst., should have provided endless sources of interest to students in architecture.

Under the direction of Mr. N. C. H. Nisbett, who had carefully prepared notes on a long programme, a tour of the principal buildings was made. Sites of early British camps, evidences of the Roman occupation, and various incidents of pre-conquest times were pointed out.

The West gate, probably built by Henry III. stands at about the site of the entrance to the Roman city. The building is now utilised as a small museum and showplace, containing relics of civic interest. The County Hall, which was next visited, is a large XIIIth century building with two arcades, and appears to be a later part of the Norman Castle, of which little evidence remains. The piers of the arcades have clustered Purbeck marble shafts, and are specially interesting in rising from circular bases, and terminating in the circular abacuses of the caps. Remains of the dais are still to be seen, and behind it, an unusual detail is the small window in the end wall ensuring supervision and attendance. It is a matter of regret that certain structural alterations were made in the XIXth century, chiefly in the transposing of a door and window for the supposed convenience of the assizes, which are held at long intervals. The stone vaulted subterranean sally port is perhaps unique. It is in fine preservation, and although approached from private ground, it is renowned that an opportunity will be taken of acquiring it for public service.

The Guildhall, with its overhanging clock-case and supports, together with the city cross, built about 1430, were pointed out. The prebendal brick houses and other dwellings in the close were much admired, and the new borough museum was brought to the attention of the party of twenty-eight members. This building is a stone and flint built structure in a medieval design quite unsuited to a XXth century museum, but it transpired that the corporation desired that the building should harmonise with the Cathedral. Such a suggestion reflects a blind ignorance of the lessons of archaeology.

The famous cathedral (which we illustrated and described in our Cathedral series on October 1, 1892) needs no description here. Mr. Colson, the architect to the fabric, gave an interesting account of the history of the building, and of the re-roofing of the nave in recent years. It is remarkable that a huge cathedral as large as the present church should have existed in Norman times. The choir screen is an oak fitting inserted by Sir Gilbert Scott in place of a screen designed by Imigo Jones. The latter is said to be still preserved, and it is to be hoped that great care will be taken of it, and the question of re-erection kept in mind.

Wolvesley Castle is one of the principal historic ruins of Winchester, standing upon the site of an important Roman house, and becoming later the residence of Saxon kings. Here is supposed to be the apartment in which Egbert held council in the IXth century, and declared that this country should be called England. The old walls show a careful and general re-use of old materials. A large Renaissance house, dating from 1607, now stands upon part of the site.

The ancient and well-known college was keenly inspected and appreciated. The development of the institution was explained by plans and prints. The two courts with gate towers are splendid examples of medieval educational establishments, and the chapel is unusually high for its length; the latter has suffered very considerably in the matter of fittings and decoration inserted in the XIXth century. The large schoolroom, built in 1683, is almost certainly the work of Wren, although no documentary evidence exists. The cloisters are simple yet interesting, but the most unusual feature is the Fromond's chantry, placed in the middle of the cloister-garth. Of modern works, Mr. Champneys' "Memorial Buildings" are the best, although leaving much to be desired. A South African War memorial is seen in a new gateway designed by Mr. F. L.

Pearson. The new science school, however, is a most unfortunate piece of design, from all points of view. The façades have many features which are utterly meaningless; perhaps the worst of these is the carved stone tympanum in the wooden pediment and cornice, stained and varnished!

The historic Hospital of St. Cross was finally visited. No description is here needed, but it may be of interest to recall that the institution was founded in 1136 for thirteen poor brethren. The present lodgings were built in the XVth century, and it is supposed that the original dwellings were located on the south side of the church. The latter is a large edifice, and very interesting as a "transition" Norman work. It is to be deplored that the interior of the chancel should have been so ruthlessly spoiled by virulent colour decoration designed by the late Mr. Butterfield. The scheme consists of a variety of coarse patterns having no relation to the unique architecture of the chancel, and the result is nothing short of barbaric. An inspection of the kitchen, with its ancient utensils, and of the hall, terminated a splendid day's instructive sight-seeing.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W. Mr. J. Williams Benn, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 1,394, for housing purposes, and 1,750, for purchase of land for an open space; Poplar Borough Council 20,000, for electric light installation, and 740, for erection of a wall, etc.; Wandsworth Borough Council 5,500, for street works, etc. Sanctioned also given to the borrowing by Shoreditch Borough Council of 9,958, for electric light installation and meters, and Westminster City Council of 6,953, for sewer reconstruction works.

Schools.—The Education Committee recommended and it was agreed that application be made to the Board of Education for approval to the finished plans of the undermentioned new schools, enlargements, etc.:

Electoral Division.	School.	Contractor and amount of Tender.	Work included in plans.
<i>New Schools:</i>			
Wandsworth	Dunt's-hill	Messrs. Holliday & Greenwood, Limited, £23,837.	Two-story building for senior mixed and junior mixed, with drawing class-room and science room, and separate one-story building for infants. Total accommodation, 1,140.
Woolwich	Timbercroft-road	Messrs. G. E. Wallis & Sons, Limited, £19,556.	Three separate one-story buildings for senior mixed, junior mixed, and infants. Total accommodation, 980. (Planned for future enlargement by an additional class-room for each department).
<i>Enlargements:</i>			
Woolwich	Elizabeth-street..	Messrs. E. P. Bulled & Co., £3,299.	Enlarging the school by 150 places; also erecting combined cookery and laundry centre, drawing class-room, and science room.
Central Hackney ..	Signon-road ...	Messrs. J. Chessum & Sons, £1,686 15s. 8d.	Enlarging the school by 130 places, and extending boys' covered play-ground on roof.
<i>Centres, etc.:</i>			
Wandsworth	Rosendale-road..	Messrs. J. & C. Bowyer, £3,297.	School for 60 mentally defective children.
East Islington	Ambler-road ...	Messrs. J. Willmott & Sons, £3,095.	School for 60 mentally defective children.
Wandsworth	Oak-lodge	Mr. E. Triggs, £4,700 and £500 for further works.	Alterations to premises to adapt building for thirty resident and 10 non-resident elder deaf girls; and two new buildings in rear of site.

Avery-hill Mansion.—Sir William Collins, the Chairman of the Education Committee, stated, with reference to a proposal that the Avery-hill Mansion should be utilised as a day training college, that communications had taken place between his committee and the Parks Committee as to the practicability of the suggestion, and he understood that the Parks Committee regarded the proposal favourably. The matter was, however, still under consideration.

Fleet-street Widening.—Upon the recommendation of the Improvements Committee it was agreed to contribute 1,107, one-half of the net cost of the widening of Fleet-street at No. 71, to 60 ft., proposed to be carried out by the City Corporation.

The Lamp Standards on Waterloo-bridge.—In answer to Mr. Horniman, Mr. Straus (Chair-

man of the Bridges Committee) said that his committee were considering the reference made to them with regard to the removal of the lamp standards from Waterloo-bridge and had decided to consult Mr. Frampton as to whether these standards were still fit to be used for electric lighting purposes. He was glad to be able to contradict the statement that any of these standards were broken. Out of the eighteen, sixteen were perfectly sound, and the others were only slightly damaged, and could be easily repaired. The standards were not of bronze, but were cast-iron, and a very good example of old cast-iron. They were placed on the bridge in 1817.

Tramways.—The report of the Highways Committee, giving the account of receipts and expenditure on the Council's tramways for the year ending March 31, 1904, was submitted.

Mr. Gaskell called attention to the difference between the estimates a year ago and the actual facts now before them. A year ago it was estimated that the net receipts would be 128,770, on the electric system, and 20,000, on the horse system, a total of 148,939. The actual net receipts, however, were 94,452, or a deficiency of 52,487. Seeing that some time ago the chairman of the Committees told them that receipts from the electric system would soon be 1,000,000, a year, this was very disappointing.

Mr. Percy Harris considered there was justification for calling attention to the great discrepancies in the estimates.

Mr. A. Baker (Chairman of the Highways Committee) claimed that the Council had every reason to be satisfied with the results of the tramways so far, seeing the delays and disadvantages which had been experienced in connexion with the reconstruction work. As a matter of fact, they anticipated a loss of 15,000, on the Southern system, but they had reduced the loss to 8,000. They had to pay interest charges and sinking fund for eighteen months before a tramcar was run, and had a private company been operating the lines they would, on the results of the year, have declared a dividend of 5 per cent. When they generated their own electricity they would save half the present cost. With regard to the conduit system, he believed that it was the best system

and the cheapest in the end for them to adopt. The report was adopted.

Motor-car Registrations.—The Highways Committee reported that, in accordance with the provisions of the Motor-car Acts, the Clerk of the Council had, from June 18 to July 2, registered 149 motor-cars and 91 motor-cycles, thus making the total number of cars and cycles registered up to the last-named date 3,768 and 2,697 respectively.

Working Class Dwellings.—Mr. Bruce submitted a return from the Housing of the Working Classes Committee, from which it appears that the total gross income for the year from all the dwellings amounted to 89,873, or 1s. 7d., and of this a sum of 40,269, or 3s. 10d., or 41.81 per cent., was required for outgoings during the year, as compared with 32,948, or 5s. 5d., or 44.45 per cent. during the preceding year. In addition

to this the sum of 46,832l. 2s. 8d., or 52.11 per cent., was required for interest and sinking fund charges, as against 35,269l. 6s. 7d., or 47.58 per cent., during the year 1902-3. Upon reviewing the operations of the Council as a whole since the opening of the first block of dwellings in April, 1894, it is found that there is a balance in hand amounting to 12,050l. 18s. 7d. after taking into account a net contribution from rates of 22,000l. 18s. 10d. The net charge on the rates is entirely due to the debt charges in respect of undeveloped estates, for although amounts have been raised in the rate in respect of dwellings, there is no deficiency on the income account of the dwellings as a whole, as a result of the Council deciding itself to erect and manage them. Such a result may, the committee think, be regarded as satisfactory. The total expenditure on capital account on all the dwellings and estates up to March 31, 1904, amounted to 1,731,904l. 3s. 3d., which sum represents the actual payments made up to that date, and does not include liabilities under contracts for buildings in course of erection. The dwellings mentioned in the accounts comprise 3,996 tenements, 658 cottages, and 1,147 cubicles containing accommodation for 24,467 persons.

The return was received.

The Criterion Theatre.—Sir Algernon West asked the chairman of the Theatres Committee whether his attention had been drawn to a statement by the chairman of Spiers and Pond (Ltd.), to the effect that his company were unable to pay a larger dividend in consequence of the requirements made upon them by the County Council.

Mr. Yates, the Chairman of the Committee, said it was true that in 1899 certain requirements were made on the managers of the Criterion Theatre, and these were carried out in 1903. They were made on the authority of the Lord Chamberlain, and were the minimum that could be asked for, in order to secure that this theatre should be rendered safe for the public. The whole of the negotiations in connexion with this matter took place with Sir Charles Wyndham, and the committee had had nothing to do with Spiers and Pond (Limited).

London Traffic.—Mr. Greenwood moved, in pursuance of notice of motion: "That, having regard to the necessity for providing additional traffic facilities in London and to the importance of linking up the Council's northern and Southern tramway systems, it be referred to the Improvements Committee to consult the Highways and Bridges Committees and to report at an early date—(1) whether the South-Eastern and Chatham and Dover Railway Company are contemplating the rebuilding of Charing-cross Station and the widening of Hungerford-bridge; (2) whether the Council can be advised to take the opportunity of submitting to Parliament a scheme for the acquisition by the Council of Charing-cross Station and Hungerford-bridge, providing the railway company with a site for a new terminus station on the Waterloo side of the river in place of the present terminus at Charing-cross, and erecting for general traffic a new road-bridge of sufficient width and capacity to take a double line of tramway in the centre of the roadways, so that the Council's northern and southern tramways from Aldwych to Waterloo could be linked together; (3) what saving of capital moneys might be anticipated in carrying out such a scheme by the avoidance of the rebuilding of Lambeth-bridge and of the widening of Waterloo-bridge, and in other ways, and what would be the general result to London of throwing open such an exceptionally fine access between the northern and southern part of the county; (4) what would be the estimated gross cost of each principal portion of the scheme, the estimated recoupment by disposal of the surplus land, and the estimated net cost."

Mr. Cornwall seconded the motion, which was supported by Mr. Straus and others and adopted.

The Council soon after adjourned.

THE BRITISH MUSEUM LIONS.—In the House of Commons recently, replying to Mr. MacNeill, who asked what had become of the bronze lions which formerly were along the line of railings in front of the British Museum, and which were removed to widen the footway, Lord Balcarras said:—Twelve lions were removed to St. Paul's Cathedral, with the concurrence of the Trustees of the British Museum; the remainder are at the Museum, in charge of the Trustees.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.
Paddington, South.—Buildings on the south side of Moscow-road, Bayswater, eastward of Bark-place (Messrs. Metcalf and Greig).—Consent.

Camberwell, North.—Houses for the working class on the north and south sides of Beckett-street and east side of Toulon-street, Wyndham-road, Camberwell (Mr. W. Oxtoby for the Metropolitan Borough of Camberwell).—Consent.

Width of Way, Lines of Frontage and Construction.

St. Pancras, South.—Two iron gangways at the third and fourth floors, and alterations to an existing gangway at the second floor of premises on the north and south sides of Beaumont-place, St. Pancras (Messrs. Maple and Co., Ltd.).—Consent.

Battersea.—Coal-conveying plant across Lombard-road, York-road, Battersea (Mr. W. M. Wilkins for the Council of the Metropolitan Borough of Battersea).—Consent.

Formation of Streets.

Lewisham.—That an order be issued to Mr. A. H. Kersey, sanctioning the formation or laying out of a new street for carriage traffic to lead from Gabriel-street to Grierson-road, Lewisham.—Agreed.

Wandsworth.—That an order be issued to Mr. J. C. Radford refusing to sanction the formation or laying out for carriage traffic of new streets on a site abutting upon the west side of Gwendolen-avenue and the south side of Hazlewell-road, Putney (for Lord Westbury).—Agreed.

Islington, West.—A deviation from the plans sanctioned for the formation or laying out of a new street to lead out of the east side of Caledonian-road, Islington, to the north-eastern side of Stock Orchard-crescent, so far as relates to an alteration in the gradient of such street (the Loraine Property Company, Ltd.).—Refused.

Space at Rear.

Chelsea.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building upon a site abutting upon the western side of Sloane-street and northern side of Basil-street, Chelsea (Mr. F. S. Chesterton for Mr. Cobb).—Consent.

Buildings for the Supply of Electricity.
Marylebone, West.—A generating-station on a site abutting upon Richmond-street and Salisbury-street, St. Marylebone (Mr. J. Wilson for Metropolitan Borough Council).—Consent.

The recommendation marked + is contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—Last Saturday this Society visited Wakefield, and spent some time in going through Messrs. Gibson and Russell's council offices for the West Riding County Council. The entrance hall, with its marble floor and walls and plaster domical ceiling, the council chamber (seating 120 members), and all the principal rooms were found to be of great interest, and worthy of more thorough study than time permitted. Afterwards the XIVth century chantry on the bridge was visited. Externally this must have been of wonderful richness and beauty. Unfortunately the stone has weathered so badly that little remains but a suggestion of the original effect in the part which escaped the restorer's hand early in the last century. Internally there is still some most interesting detail in a very rich canopy and niche, showing most delicate workmanship. The roof is also of interest.

NEW STAND, GOODWOOD.—The erection of the new grand stand at Goodwood racetrack is now in progress. The structure will be 258 ft. long and 50 ft. high. Under one roof will be arranged the royal box, the house stand, and accommodation for members. Tattersall's, and general visitors. Below a subterranean passage, 10 ft. in width, leads from the paddock to the lawn, and both these enclosures have been enlarged. The stand and lawn together will afford accommodation for 10,000 visitors, and a separate building has been erected for the Press, telegraphists, and officials. The work has been carried out from the designs of Mr. A. J. Henderson, architect, by Mr. Wallis, contractor.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—A highly interesting visit was made by the President—Mr. D. B. Butler—and members of the Society of Engineers on the 29th ult. to the Portland Cement Works of Messrs. Martin, Earle, and Co., at Wickham, Rochester, where they witnessed the manufacture and testing of cement made by the ordinary method and by the new Rotary Kiln System. The works, which are now about a mile in length, are situate on the River Medway, and are said to be the largest Portland cement works in Europe. They were acquired by the present company in 1891, when the plant only consisted of a few kilns of the chamber type, and a pair of mills for grinding the clinker, power being supplied by a 250-h.p. beam engine. The works were enlarged from time to time until in 1899 they were equal to an output of 3,000 tons per week. About that date, becoming aware of the remarkable results obtained in the United States with rotary cement kilns, the firm investigated the question and erected a full-size experimental kiln on the American system, with which they made a long series of exhaustive experiments. Numerous modifications, alterations, and improvements were introduced, until, after about two years of uninterrupted experiment, Messrs. Martin, Earle, and Co. succeeded in evolving a perfect rotary kiln, capable of dealing successfully with the Medway raw materials—chalk and clay—for the manufacture of Portland cement. The rotary continuous kiln was found to offer peculiar facilities for regulating the burning during the process of clinkering, whereas with the intermittent chamber kiln no such correction is possible. The new system also showed itself superior to the old, both as regards the quality of the product and the cost of production. The rotary kiln house is a large brick building in which the sixteen kilns are arranged in line. The kilns are provided with slurry agitators and coal-firing apparatus. Some are also fitted with apparatus for drying sufficient fuel—which is finely powdered coal—for the entire battery. The body of each kiln is 90 ft. in length, constructed of mild steel, and lined with basic fire-brick. The kilns are set on the incline, and rotate at such a speed as ensures a well-burned clinker. The remarkably large output of 200 tons of clinker per week can be obtained from each kiln, maintaining an average of 25 cwt. per actual running hour of the kiln. The clinker discharged from the kilns is transferred to horizontal revolving coolers, from whence it is transmitted by conveyors to the crushers, and is afterwards elevated to cooling towers. The dry-mill house is situate behind the cooling towers, and the milling is there done by "Griffin" mills arranged in separate batteries of six mills each, which receive the clinker from overhead hoppers through shutes. The finished cement is conveyed from the dry-mill house by ordinary screw conveyors to the warehouses, where a number of customers have stores specially reserved for their own use. The men employed in connexion with the rotary kilns are approximately two-thirds fewer than required to obtain the same output from the old-fashioned kilns. Three sets of engines are employed to drive the wet plant, the dry-mill and the coal-mill plants respectively, all of which are identical in size and type. Each engine is of the triple expansion marine type, designed for mill work, with rope drives, and working with surface condensers and centrifugal circulating pumps. High-pressure steam is supplied to the wet plant from a battery of three Lancashire boilers, and to the other plants from a battery of five similar boilers, all fitted with Galloway tubes. The rotary kilns are driven by two horizontal engines with rope-drives, and take steam from three marine boilers. The principal buildings on the works, as well as the chalk quarries, are lighted by electricity. Powerful arc lamps are employed, and the current is supplied from a generating station on the works. A well-appointed laboratory is attached to the works, being equipped with every known scientific device for testing not only the raw materials and the finished cement, but also the exact proportion of mixtures of the raw materials at the various stages of manufacture. It is also fitted up for general research work.

THE JUNIOR INSTITUTION OF ENGINEERS.—Visits of this Institution were recently paid to the Chelsea Generating Station of the Under-

ground Electric Railways Company of London, Lots-road, Chelsea, and to the adjoining London County Council's Pumping Station. At the former the General Manager, Mr. J. R. Chapman, and the Resident Engineer, Mr. J. W. Towle, were present, and the visitors were enabled to make a complete examination of the work so far as it had advanced. The station will supply current for working the trains of the District Railway from White-chapel to the various western and southern termini, Richmond, Wimbledon, Hounslow, Ealing, etc.; also the tube trains of the Baker-street and Waterloo Railway, the Great Northern, Piccadilly, and Brompton Railway, and the Charing-cross, Euston, and Hampstead Railway. The initial equipment of these lines will be about 150 trains. The station is designed for ten units of 5,500 kilowatts each, and one unit of 2,500 kilowatts. The output of the station will be three-phase, 33½ cycles, 11,000 volts, and will be distributed at this potential to twenty-three sub-stations. The site comprises 3.67 acres, and has a water frontage of 1,100 ft. The building is 453 ft. 6 in. long by 175 ft. wide, with an office annex 25 ft. by 81 ft. The steel frame of this building is entirely self-supporting, and contains 6,000 tons. The foundations extend from 30 ft. to 36 ft. below the ground level, and the loading of the clay does not exceed 4 tons per sq. ft. Attention may be called to the group system which has been followed throughout in both the mechanical and electrical installation—i.e., eight boilers are grouped to one turbo-generator; these boilers have their own feed-pump, and the generator supplies its own section of bus-bar. No attempt is made to cross-connect the steam piping of the different groups, except at the east end of the building, where three groups are brought together in one small auxiliary header for supplying exciters, air compressors, bouse pump, etc. The station is designed for turbine engines, and illustrates the reduction in floor area which can be secured with this type of engine as against the reciprocating type.

At the L.C.C. pumping station Mr. H. M. Routhwaite, Mechanical Engineer, Hon. Mem. J.I.E., received the members. There are here four horizontal gas engines, having each two 18½-in. cylinders, with 2-ft. stroke, both coupled to one crank (cylinders at opposite ends). On each crank shaft is a 7-ft. 6-in. rope pulley, grooved for eight 1½-in. ropes, and these ropes lead down to similar pulleys of 6 ft. 5 in. diameter on the four centrifugal pumps. The pumps have suction and delivery pipes 23 in. diameter, and impellers of 66 in. diameter. These engines each indicate about 200 horse-power, at about 150 revolutions per minute, and the pumps each throw about 44 tons per minute. There are also four similar engines, with 18½-in. cylinders, 2-ft. 6-in. stroke, 7-ft. 6-in. rope pulleys on crank shafts, grooved for ten 1½-in. ropes, and 10-ft. 4-in. similar pulleys on pumps. The pumps have 32-in. pipes and 72-in. impellers. These engines each indicate about 240 horse-power, at about 160 revolutions per minute, and the pumps each throw about 85 tons per minute. The 200-horse-power engines pump from the low-level sewer, and the other engines from the higher level Counties Creek Sewer. The whole plant works only during rainy weather, and pumps storm-water only into the Thames. The average number of hours per annum during which it will be required to run is estimated at sixty or seventy, though, of course, in exceptionally wet years it may be that the machinery will run as long as 100 hours.

BUILDERS' BENEVOLENT INSTITUTION.

The fifty-seventh annual general meeting of this charity was held at the offices, 31 and 32, Bedford-street, Strand, W.C., on Wednesday.

In the absence of the President (Sir Weetman Pearson) through illness, the chair was taken by Mr. John T. Bolding.

The notice convening the meeting was taken as read, and the minutes of the last annual general meeting were read and confirmed. The following report was read and adopted:—

"The Committee has the pleasure to present its fifty-seventh annual report, and is glad to be able to state that, notwithstanding the continued depression in all branches of the building trade, the funds of the Institution, by careful and economical management, have been adequate for the present requirements. It is very desirable that the benefits of this charity should be extended, but this can only be done judiciously with an increased income. The Committee, therefore, appeals to subscribers, donors, and their friends for a continuance of their generous support.

"Since the last report two elections of pensioners have taken place—in November 1903 and May 1904—when ten men were added to the list. The Committee was fortunate enough on both occasions to be able to elect all the really eligible pensioners, without having recourse to the costly and troublesome procedure of contested elections. Each application was minutely inquired into and reported upon before the final elections were made.

"There are now 33 men and 27 women enjoying pensions of 42l. and 30l. per annum respectively. Six pensioners (three men and three women) died during the course of the past year, burial allowances of 5l. being granted in cases where the relatives of the deceased needed assistance.

"The Committee acknowledges with the warmest gratitude all the President (Sir Weetman Pearson) has done for this charity. His personal generosity and wide influence have enabled the Committee to strengthen the financial position of the Institution and to anticipate a continuance of its good work.

"Death has dealt hardly by the Committee during the past twelve months, in taking away such valuable and respected members as the late Mr. E. Cassell, Mr. John Greenwood, Mr. B. E. Nightingale, and Mr. G. Nelson Watts.

"The Committee takes this opportunity to again thank the Trustees (Sir Arthur Charles Lucas, Bart., Mr. F. J. Dove, Mr. T. E. Rider, Mr. J. Howard Colls, Mr. T. Stirling, and Mr. J. T. Bolding); the Honorary Auditors (Mr. J. T. Bolding and Mr. R. J. Ward); and the dinner stewards for their kind and valuable services to the Institution.

"The Committee is glad to announce that Mr. William Downs has accepted the Presidency in succession to Sir Weetman Pearson.

"The annual dinner will be held in the Whitehall Rooms, Hotel Metropole, Charing Cross, on Thursday, the 24th November."

The audited accounts for the past year were received and adopted. The income was 1244l. less than in the previous year, but 427l. more was spent on the pensioners, whilst the management expenses were under a sovereign different. Sixty-six and a half per cent. of total income was paid to pensioners in 1902-3; 88 per cent. of total income was paid to pensioners in 1903-4; 10 per cent. of total income was paid for management in 1902-3; 11 per cent. of total income was paid for management in 1903-4.

The following elections were made:—As President, Mr. William Downs; as Hon. Treasurer, Mr. J. Howard Colls (re-elected); as Trustees, Sir Arthur C. Lucas, Bart., and Messrs. F. J. Dove, T. F. Rider, J. Howard Colls, T. Stirling, and J. T. Bolding (all re-elected); as Committee, Messrs. J. T. Bolding, F. J. Dove, C. Russell, G. J. Lough, Basil P. Ellis, and A. Ritchie (all of whom retired by rota but were re-elected); as Hon. Auditors, Mr. Robert J. Ward, F.S.I., and Mr. J. T. Bolding.

Votes of thanks were voted to the past President, Sir Weetman D. Pearson, Bart., M.P.; Vice-Presidents, Hon. Treasurer, Trustees, Executive Committee, and Hon. Auditors.

LIBRARY AND MUSEUM, MANSFIELD, NOTTINGHAMSHIRE.—The memorial stone has just been laid at Mansfield of a library, and the opening subsequently took place of the museum. Both institutions will occupy the same site, situated in a central position opposite the Victoria Hall, in Leeming-street, the library fronting the main road, whilst the museum is at the rear. Several months ago competitive designs for the new library were invited, and Mr. Sutton, of Messrs. Sutton and Gregory, Nottingham, was the successful architect. Mr. S. B. Frisby, of Mansfield, has secured the contract for the building. The Renaissance style is to be adopted, and the front elevation will be in Leeming-street. Mansfield stone will be entirely used for the front, and the side elevation will be of red-sand bricks, with stone dressings. The entrance will be in Leeming-street, and will lead into a hall, around which will be grouped the public rooms. Accommodation is provided on the ground floor for a leading library, 50 ft. by 18 ft. 3 in.; reading-room, with magazine and reference room screened off, 60 ft. by 25 ft. 5 in.; ladies' room, 25 ft. 6 in. by 15 ft. 3 in.; and librarian's room and packing-room. The lighting will be by electricity, and the heating by hot water. The lending library will be immediately opposite the entrance. An iron staircase will give access to a store-room on the first floor, and there will be a small hoist for books. The total cost of the building will be about 3,000l. The museum structure is of wood, with a galvanised iron roof. The foundations are of concrete, with wood floors above, the lighting is by electricity, and the heating by hot-water pipes. The museum consists of the following rooms:—Main hall, 56 ft. by 35 ft.; lecture-room, 25 ft. square; insect-room (over lecture-room), 25 ft. by 25 ft.; six side rooms on the ground floor, each 30 ft. by 10 ft.; curator's room, 25 ft. by 12 ft. There is also in the main hall a small annex, approached by stairs.

Illustrations.

JUMIEGES ABBEY.



JUMIEGES is a Benedictine abbey in the department of Seine Inférieure, near Rouen, which has been much visited and little studied; no precise account of it having been published till that of M.M. Guédy and Viatte, presented to the Salon of 1899 with plans and drawings. Yet it is the earliest of all the abbeys of Normandy, except Bernay, and must have had considerable influence on the two great churches on whose design the Norman architecture of England is mainly based, viz., Cécily-la-Forêt and St. Etienne, Caen. It was founded in 638 or 654, was burnt by the Normans in 841, and it was not completely restored till about 941. Three years later it was again destroyed by Raoul Tourbe, Count of Rouen. The present church was commenced in 1040, and was consecrated in 1067 in the presence of William the Conqueror, who presented it with many English manors. It is possible that not only the choir, but the nave as we see it now and some part of the two fine western towers, which we illustrate, were complete in 1067; for the design is more archaic than that of St. Stephen, Caen, which is variously said to have been dedicated in 1073, 1077, 1081, or 1086. In 1358, during the Hundred Years' War, the abbey was pillaged, and it was at this time that the Romanesque choir was destroyed. The XIVth century choir was but three bays long, ending in an apse of seven bays; this apse was surrounded by an ambulatory, and from the ambulatory radiated seven chapels, two of which in part survive. The abbey was again sacked in 1415 after the battle of Agincourt. In the XVth century was demolished the wooden spire, of prodigious height, of the central tower. The conventual buildings are mainly XVth century work. The two western towers are 170 ft. high. They differ slightly in design. It is asserted that in the Middle Ages only metropolitan cathedrals, certain collegiate churches, and the royal abbeys were allowed western towers precisely alike.

The upper stage of each is hexagonal. The nave has what is called the Lombard plan, though it is yet to be proved that it originated in Lombardy—i.e., compound piers and cylinders alternate, as at Durham and elsewhere. In front of the compound pier a massive roof-ridge shaft rises to the top of the clearstorey wall. These shafts supported the broad transverse arches spanning the nave. The central span of the nave was not vaulted; but, as at St. George, de Bockerville and Cécily, probably the roof timbers were set longitudinally on gables carried by the transverse arches. The nave consists of eight bays—i.e., of four coupled bays. Internally the elevation of the nave has an archaic look, and is evidently influenced by Bernay. The ground story occupies less than half the elevation; the triforium story is low and is not separated from the clearstorey stage by a string. The clearstorey stage occupies a very large space. Unlike most of our own Norman churches there is no passage in the clearstorey wall, and consequently, no inner arcade to the clearstorey windows, each of which is set in an expanse of blank wall, in the fashion of Fontaines-ave. As in St. Etienne, Caen, and Gloucester choir there is a superposed vaulted aisle; but in these two the vault is a half barrel, whereas at Jumieges it is groined. The piers and cylinder are low and massive; the pier-arches are recessed orders, but are neither carved nor moulded. As in Ely transept, patterns were painted on some of the caps, probably intended to be carved subsequently. The aisle has a lofty; each bay has two superposed windows, not separated by a string; the lower window lights the lower aisle, the upper the superposed aisle; the same arrangement was repeated at St. Etienne, Caen, St. Albans, Ely, and elsewhere. The buttresses are flat plaster strips, neither staged nor ornamented. The paucity of string courses gives a curiously archaic look to Jumieges. The western arch of the central tower survive South of the transept, in the usual position were the sacristy and chapter-house, east of cloister. South of the choir is the little parish church of St. Pierre, part of which is asserted to be work of the XIIth century; its nave, however, appears to be two centuries later. The choir church is said to have been 265 ft. long, and its nave to have had a span of 33 ft.; the choir w

45½ ft. long with a span of 31 ft. In the transepts were return-galleries, as at St. Etienne, Caen, Winchester, and Ely.

STAIRCASE, DEPTFORD TOWN HALL.

THE view is taken from the doorway of the Councillor's Assembly-room on the mezzanine floor, looking downward to the main entrance, and upward to the Council Chamber on first floor. The galleries on each side lead to the suite of committee-rooms. The drawing shows the work as now being carried out, slight modifications having been made from the competition design. The columns are in Breccia, and stairs in Sicilian marble, with wrought-iron balustrade; the walls being finished in Parian and painted.

The architects are Messrs. Lanchester, Stewart, and Rickards.

WITHAM HALL, LINCOLNSHIRE.

THE extensive alterations to this mansion, shown in the illustration, were completed in the autumn of last year. The original house was a rambling old building, built and added to at various periods, most of which has been pulled down, with the exception of the portion comprising the hall and drawing-room. This part of the house dates from about 1750.

The library wing is also part of the old house, but the upper story has been raised, and a new roof and bay added to bring it into harmony with the new dining-room wing. The new billiard-room is a handsome apartment, and has a large brick fireplace and carved wood mantel.

The block containing the kitchen offices is the oldest part of the house, probably dating from the latter end of the XVIIIth century.

At the wish of the owner the roofs were entirely re-slatted with the old stone slates obtained from the pulling down and from other old buildings. The stone work was partly from old materials and partly from new stone found on the estate.

The house is lit by acetylene gas supplied by the St. James Company, of Victoria-street, Westminster.

The general contractors were Messrs. W. Pattinson and Sons, of Ruskington, Seaford, Lincolnshire, and Mr. John Fletcher acted as clerk of works.

The drawing was hung in last year's Academy and is from the hand of the architect, Mr. A. N. Prentice.

HOUSE AT PEEBLES.

THE buildings consist of the house as illustrated, a stable and coachman's house, and an entrance lodge. The walls are built of rough squared rubble with dressed corners, ryzats, etc. The stone used is of a warm cream colour, and was obtained from Black Pasture, Prudhim, and Eastfield Quarries, which provided a slight variation in the colour. The roofs are covered with Edwards's dark blue, brown, and red tiles as they came from the kiln. These tiles are very hard, and do not take on any weathering; but a pleasing effect is obtained by mixing the various shades as they come from the kiln, without having them picked for equal shades. The casement windows are Messrs. Hopes'. The ball, staircase, and part of the study are panelled in Austrian oak. The stable buildings have been fitted up by Messrs. Muggrave, and both the stable and yard are paved with their adamantine clinkers.

The following are the contractors for the various trades:—Mason work, Messrs. Neil M'Leod and Sons, Edinburgh; joiner work, Mr. Peter Barton, Edinburgh; plumber work, Messrs. Morrison and Son, Edinburgh; plaster work, Mr. L. Grandison, Peebles; tiler work, Mr. William Fairbairn, Peebles.

The total cost of the works, including the laying-out of the garden, has been a little over 7,000.

A. HUNTER CRAWFORD.

COMPETITIONS.

PROPOSED CONSERVATIVE AND UNIONIST CLUB, CARLTON, NOTTINGHAM.—The competitive design of Mr. C. J. Whitbread, of Carlton, has been selected, and Mr. Whitbread has been appointed architect for the work, which is to commence shortly.

FREE LIBRARY, LOUGHBOROUGH.—In response to an invitation by the Loughborough Town Council, eight designs were submitted to them for a new Carnegie Library. The Council had arranged with Mr. George Hodson, M.I.C.E., F.G.S., to advise and assist them in making the



GROUND-FLOOR PLAN.

SCALE OF 10 5 0 10 20 30 40 FEET

House at Peebles. Plan.

selection of a design, and, at a recent meeting of the Council, held to consider Mr. Hodson's report, it was decided that the design submitted by Messrs. Barrowcliff and Alcock, of Loughborough, should be adopted. The assessor selected two designs—i.e., the one selected by the Council and the design submitted by Messrs. Sutton and Gregory, of Nottingham. The main entrance to the library in the accepted design is to be from Granby-street, the building being set back a distance of 19 ft. The reading-room, which has been made the main feature of the design, is 40 ft. square. A portion of this reading-room has been set apart for the use of ladies only, and is to be curtained off. The lending library is 35 ft. by 28 ft., and extends through the first floor, a wide balcony over forming the patent library, which is lighted from the top. The bookshelves are arranged in tiers 3 ft. apart and 7 ft. 6 in. high, with a window between each section giving a direct light to the bookshelves. Each section contains 24 ft. of shelving in eight tiers, giving a total accommodation of over 13,000 volumes. The borrowers' lobby is in direct communication with the entrance hall, and a portion of the counter is screened off to provide separate accommodation for children. The patent library is approached by a wide staircase from the entrance hall, and is so arranged that at a small additional cost this room can be extended to a further distance of 35 ft., thereby providing a room 60 ft. by 28 ft. The reference library, 23 ft. by 18 ft., is also arranged in direct communication with the entrance hall, and is situated about the centre of the site. There are also arranged librarians' room, store and packing room, staff mess-room, lavatories, etc. The librarian's house is to be on the Packe-street side of the site, and in direct communication with the library buildings. There is an open space of about 200 sq. yds., with a frontage to Packe-street; this would be available for any future extension, or for the erection of any other public building which may be required. The heating will be by means of low pressure hot water radiators. Externally the library will be faced with red sand stock bricks with tawny terra-cotta dressings.

BOOKS RECEIVED.

AN INQUIRY INTO DECIMAL COINAGE AND THE METRIC SYSTEM. By Edwyn Anthony. (G. Routledge and Sons.)

A DIGEST OF THE LAW RELATING TO THE EASEMENT OF LIGHT. By E. S. Roscoe. Fourth Edition; revised and enlarged. (Stevens and Sons. 7s. 6d.)

OXFORD, LINESFIELD, AND EDENBRIDGE. (The Homeland Association. 6d.)

SPECIFICATIONS IN DETAIL. By F. W. Macey. Second Edition, revised and enlarged. (Crosby Lockwood and Son.)

Correspondence.

THE ETON MEMORIAL HALL.

SIR,—I believe that there can be no objection to my calling attention to a significant fact in connexion with the competitive designs for the Eton Memorial Hall now privately being exhibited.

It will be remembered that the site of the

proposed building is opposite the continuous facade formed by Upper School, the Ante Chapel, and the porter's lodge, and flanked by two modern houses, one of considerable height. The new schools, designed by Woodyer in the Tudor style, are also prominent. With the exception of the Manor House (which makes no attempt at architectural design) and the Upper School (in the early classic manner), the whole of this group exhibits the features of Tudor design, and Upper School itself has had a narrow escape, during the last half of the XIXth century, from being "brought into harmony" by the substitution of Gothic features for the original design.

Contrast with this last suggestion the fact that of the sixteen schemes only three exhibit any close approach to this traditional style, the majority being in favour of pure classic. How different the spirit to that in which Pearson ruined Cockerell's lovely fragment at the Cambridge University Library by the addition of "a little thing of his own" in the most uncompromising "Third Pointed" ?

I trust that, by calling attention to this point before the awards are made, I am not infringing any of those mysterious and dangerous laws of architectural "etiquette" which beset the intrepid.

ETONIAN.

WATER-CLOSET PARTITIONS.

SIR,—A case of some interest to builders, sanitary authorities, and owners of property was recently heard by Mr. Cluer, one of the Magistrates at Worship-street Police Court, in which the owners of premises in Wilson-street, Finsbury, were summoned by the Finsbury Borough Council for that a water-closet, newly constructed by their builders, was "in bad order, out of condition," and "required alteration and amendment." The proceedings were taken under section 41 of the Public Health (London) Act, 1891, and the prosecution alleged that the partition walls of this water-closet, which abuted on a "workplace," situated on the top floor of the building, did not comply with clause 2 of the London County Council's by-laws in reference to the construction of water-closets, which reads as follows:—

"He shall construct such water-closet so that on any side on which it would abut on a room intended for human habitation, or used for the manufacture, preparation, or storage of food for man, or used as a factory, workshop, or workplace, it shall be enclosed by a solid wall or partition of brick or other materials, extending the entire height from the floor to the ceiling."

This partition consisted of 1-in. matchboarded, properly tongued, etc., and the Borough Council's contention was that this was not "other materials" of a solid character. Instead of proceeding against the "person constructing"—i.e., the builders (who invited them to do so)—for any contravention of the by-law, they waited for three months after the completion of the work, and then took proceedings against the owners. The Magistrate, however, was against them on the point of "other materials," and held that it was solid. The builders invited the Superintending Architect of the London County Council to define what "other materials" would, in his opinion, imply, but that gentleman declined to commit himself by so doing. The Borough Council then, finding that the Magistrate was against them on this point, further alleged that the materials had shrunk and the joints opened, when he adjourned the case so that he could see himself whether this was so or not, and in the end dismissed the summons, with 2l. 2s. costs against the Borough Council. G. J. GAVIN.

The Student's Column.

NOTES ON PORTLAND CEMENT:

CHAPTER II.—THE CHEMICAL ANALYSIS AND VALUATION OF THE RAW MATERIAL USED IN CEMENT MANUFACTURE.

ESENTIALLY Portland cement consists of silica, alumina, and lime. The materials from which the lime is obtained are of very different qualities. They are found as soft chalk or hard crystalline limestone and many degrees between these two, but, as a rule, the harder the substance the more carbonate of lime it will contain. The soft chalks, although nearly pure carbonate of lime when dried, in natural state contain much water; while some of the hard limestones in natural state contain as much as 90 per cent. CaCO_3 . Just as the limestones vary, so the other raw material, the clay, is found in different forms. It occurs in all grades, from the plastic clay or river mud to the hard shales. These raw materials are never found quite pure, but containing varying proportions of foreign chemical compounds, such as carbonate of magnesia, water, sulphuric acid, alkalies, coal, etc. Because of this, it is of the greatest importance, if the finished cement has to be a reliable one, for the manufacturer to know their exact composition. This is only determined by chemical analysis. The following methods of analysis are as carried out by Dr. Karl Schosch, of the High School of Charlottenburg:—

Limestone Moisture.—100 grammes of the crushed material is put in a wide glass tube and dry air pumped through it till the weight is constant. The loss in weight is the moisture to air-dryness. The tube is next placed in an air oven and kept at 105°C . for two hours. The loss in weight added to last result gives the total moisture.

Loss on Heating.—Weigh 2 grammes of the dry substance, after grinding into a platinum crucible and heat over a gas blow-lamp till the weight is constant. The loss is combined water, organic matter, and carbonic acid. The carbonic acid is estimated in another portion of the dry substance by any of the well-known methods for carbonates (Mohr's apparatus is recommended). This result deducted from the last gives combined water and organic matter. The combined water may be estimated in another portion of the substance by heating 2 grammes in a hard glass tube, through which a current of dry air is passed, and catching the water expelled in pure dry calcium chloride.

Insoluble Residue.—In most limestones this is present only in small quantities, so it is not necessary to separate the silica, sand, and oxides of iron and alumina. After determination of the loss on heating, transfer the residue in the crucible to a porcelain basin, add a little water, then gradually about 10 ccs. of 20 per cent. hydrochloric acid, and dilute the whole to about 250 ccs.

Heat to boiling, and add ammonia till alkaline (test with litmus paper). The precipitate consists of clay, sand, silica, oxides of iron and alumina. Take the basin from the burner, when the precipitate will quickly settle to the bottom. Filter into a litre flask, and wash till not a trace of chlorine is in the washing water (test with silver nitrate).

In washing do not stir up the precipitate with the water, because the silica might go through the filter paper. After washing, transfer the precipitate, yet wet, to a platinum crucible, and burn for ten minutes after the paper is ashed.

Lime.—When the filtrate in the litre flask is cool make up to the mark with distilled water. Draw off 500 ccs. into a beaker, add a few drops of hydrochloric acid to prevent precipitation of the carbonate of lime, and boil. Next carefully add crystalline oxalic acid, then slight excess of ammonia. Allow the precipitated oxalate of lime to stand—in a warm place if possible—during the night. By this means it is not necessary to reprecipitate the lime. Filter, wash with boiling water till no chlorine is in the washings (test with silver nitrate), dry, ignite in a platinum crucible over a blast-lamp till constant, and weigh as CaO .

Magnesia.—To the filtrate from the lime add a few drops of hydrochloric acid, evaporate to a bulk of 250 ccs., allow to cool, and add 250 ccs. of 10 per cent. ammonia, then sodium phosphate. Stir well till the phosphate of magnesia separates, allow to stand twelve

hours, and filter. Wash with cold water to which 20 per cent. of ammonia has been added till the washings are free from chlorine (test with silver nitrate and nitric acid). Dry the precipitate, and if in small quantity ignite along with the filter paper, if in large proportion separate the phosphate as far as possible from the filter paper, which is burned in a platinum wire loop, adding the ash to the precipitate in a porcelain crucible, and ignite the whole till quite white. If necessary, add a drop of nitric acid. So long as black points are to be seen the ignition is not complete. Weigh the phosphate ($\text{Mg}_2\text{P}_2\text{O}_7$) and calculate to MgO or Mg_2CO_3 .

Sulphuric Acid.—Acidulate the remaining 500 ccs. in the litre flask with hydrochloric acid, heat to boiling, and precipitate the sulphate with barium chloride. Allow to stand overnight, and if only in small quantity wash with cold water, otherwise use hot water. A good paper for filtering barium sulphate is made by Schleicher and Schull (Blue Band No. 589). Ordinary filter paper moistened with a 10 per cent. solution of ammonium acetate will prevent the barium sulphate passing through. After good washing (test with silver nitrate for chlorine, not for barium with sulphuric acid), burn the precipitate in a porcelain crucible. If pyrites is present the following separation is necessary. Put 2 grammes of the original dried substance into a porcelain basin, cover with bromine water, add 25 to 30 ccs. hydrochloric acid, and boil. By this means the sulphide is oxidised into sulphate. The total sulphate is then estimated as above. The difference between this and the last result gives the sulphur present as sulphide.

Alkalies are usually obtained by difference. If required to be estimated, use Laurence Smith's method, which is as follows:—Mix 0.5 gramme of the very finely-powdered substance with 0.5 gramme of sal-ammoniac and enough pure precipitated carbonate of lime to bring the mixture to about 80 per cent. CaCO_3 ; put the mixture into a platinum crucible. Heat, with the lid on, first for half an hour over a Bessler burner, then for another half hour over a blast-lamp. The alkalies assume the form of chloride. Soak the crucible and contents in water; heat, and filter. From the filtrate precipitate the lime by means of carbonate of ammonia at a boiling heat, filter off the carbonate of lime, evaporate to dryness, ignite the residue gently to remove the sal-ammoniac, and weigh what remains. This residue should consist only of fixed alkali chloride, but generally it is contaminated with lime and magnesia; hence it is advisable to redissolve it in the crucible in a little water, add a pinch of pure lime, and treat again as before. The pure alkali chlorides are weighed and the potash determined by chloroplatinic acid.

Analysis of Clays.—The moisture, combined water, carbonic acid, and organic matter are estimated as in limestone.

Gross Analysis.—Mix 2 grammes of the very finely-powdered dry substance with about 10 grammes of a mixture of sodium carbonate 50 parts, potassium carbonate 50 parts, and potash nitrate 5 parts. Place in a platinum crucible and fuse over a blow-pipe flame till all effervescence ceases. While the contents of the crucible are still molten, quickly chill the bottom of the crucible by placing in a shallow basin containing cold water. Now place the crucible and lid in a large porcelain basin and cover with water to which a few drops of hydrochloric acid has been added. When the melted mass is free from the crucible remove the latter from the basin, washing it thoroughly. Evaporate to dryness, take up the residue with water acidulated with hydrochloric acid, heat to boiling, and filter the silica, care being taken not to wash any of it through the paper as explained in limestone analysis. Dry and ignite, taking precautions to prevent any of the silica, which is very light, escaping from the crucible. Heat the filtrate from the silica to boiling and add ammonia in slight excess. Filter the precipitated oxides of iron and alumina, wash thoroughly, transfer while yet wet to a platinum crucible, and ignite. If manganese is present, the following method of separation is employed:—Neutralise the filtrate from the silica in the cold with sodium carbonate; mix with perfectly neutral sodium acetate and heat to boiling.

The alumina and iron are precipitated as basic acetates, but at boiling heat the manganese salt is quite soluble. After two minutes boiling take the beaker from the flame, allow to settle, filter hot and as quickly as possible, and

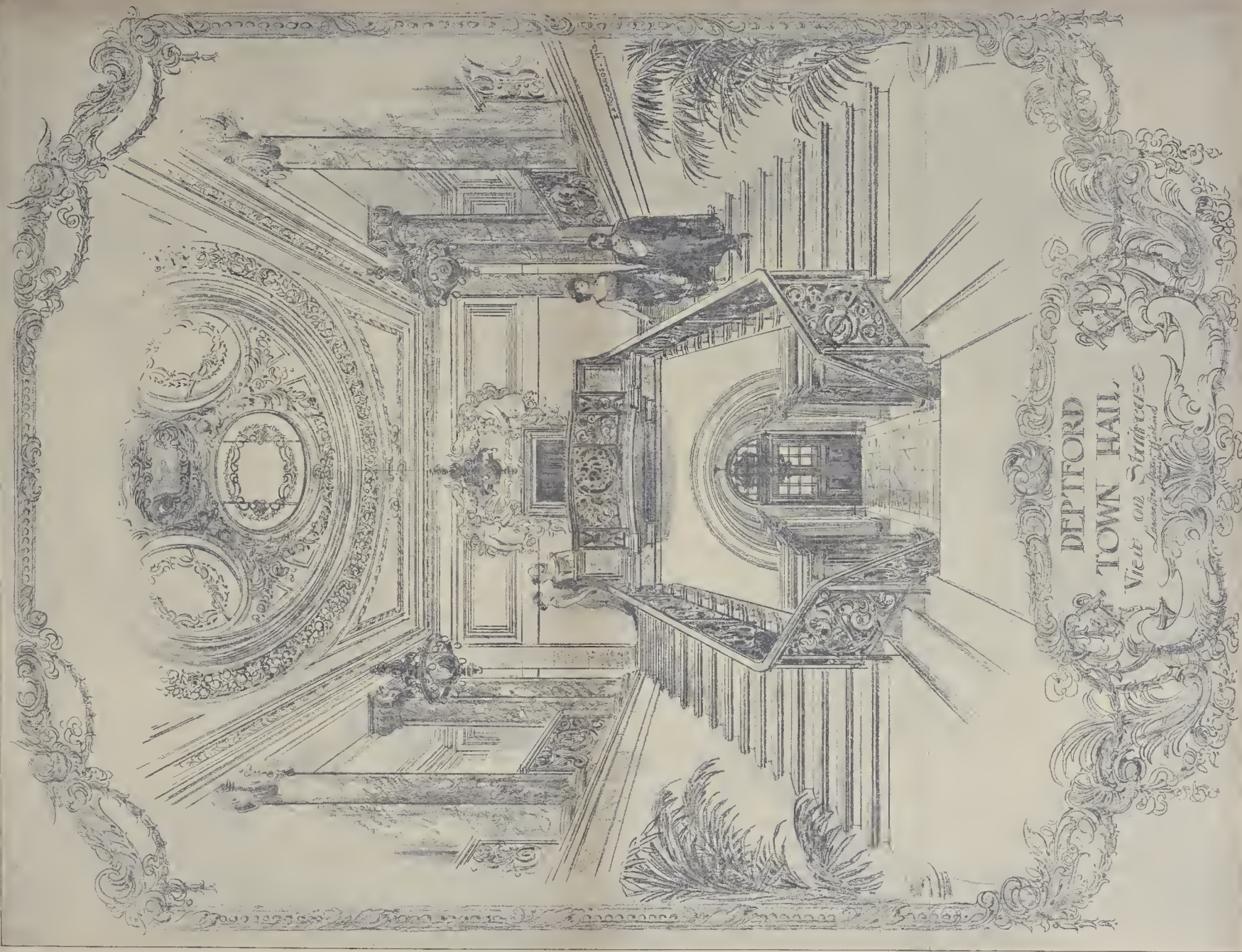
wash with very hot water. Next dissolve the precipitate in hydrochloric acid and precipitate the second time with ammonia. All the manganese is in the two filtrates, which are mixed and neutralised with sodium carbonate. Add excess of bromine water, boil and filter the separated manganese. Wash with boiling water, transfer while yet wet to a platinum crucible, and ignite sharply. Weigh as Mn_2O_3 , and calculate to MnO .

Lime, magnesia, sulphuric acid, pyrites, and alkalies are separated as explained in limestone analysis.

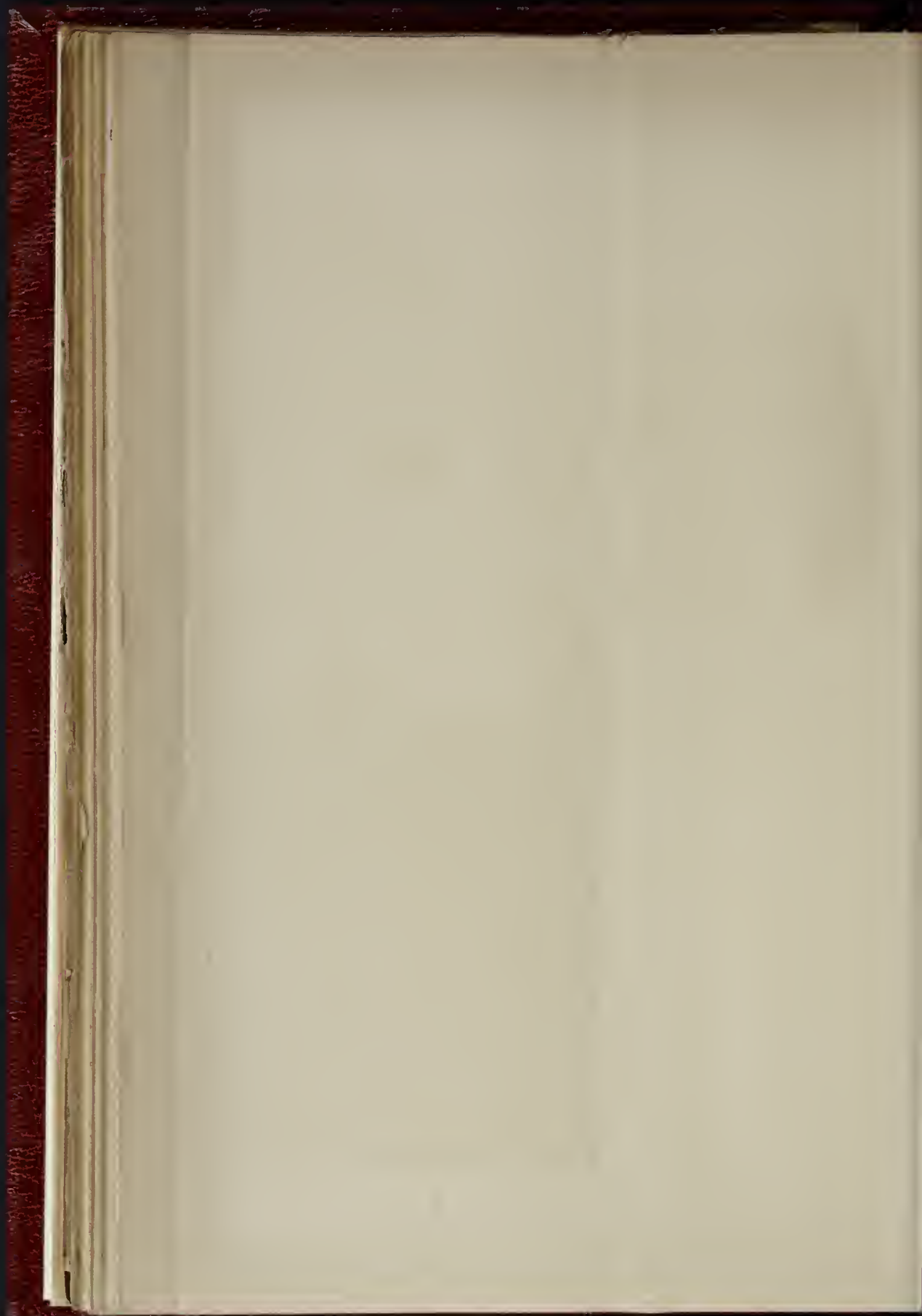
In valuing his clay the gross analysis alone does not give much information to the cement-maker. A method founded on that of Lunge and Schocher's for marls is used with advantage by the author. The *modus operandi* is as follows:—A gross analysis is done as just explained, only the iron is separated from the alumina by fusing the ignited oxides with acid sulphate of potash, dissolving in sulphuric acid and titrating with standard potassium permanganate. One gramme of the dry clay is then ground to approximately such a fineness as it would be in grinding the raw material for practical working, and mixed with enough pure dry carbonate of lime to bring the total CaCO_3 in the mixture to about 80 per cent. The mixture is strongly ignited in a platinum crucible over a blow-pipe flame, the same heat and time of ignition being maintained each analysis. The mass is transferred to a large porcelain basin, water added, and then about 20 ccs. hydrochloric acid. The liquid is evaporated to dryness, the residue taken up with water and a few ccs. hydrochloric acid, filtered, and washed free from chlorine. The precipitate consists of silicic acid, sand, and undecomposed silicates. This is boiled along with the filter paper in a nickel basin with 20 per cent. solution of sodium carbonate, filtered, and washed, first with hot sodium carbonate solution and then hot distilled water, till all the silicic acid is dissolved and the sodium carbonate washed out. The residue on the filter consists of difficultly fusible silicates and coarse sand, which is ignited in a platinum crucible and weighed. This result varies according to the time of heating and the intensity of heat applied; but, if always carried out in the same manner, comparative results can be obtained which will give the manufacturer an expression of the cement-making value of the clay. The other constituents are determined as explained under gross analysis. Fresenius' modification of Seger's method, by decomposing the clay with hot concentrated sulphuric acid, is not convenient and is tedious, which led the author to adopt the carbonate of lime method; moreover, sulphuric acid does not act on the felspar and fine sand, so that the cement-maker cannot by this method determine if his clay is or is not easily decomposable in the burning of the raw mixture. The results of analysis given below are obtained from a sample of clay by the three methods described.

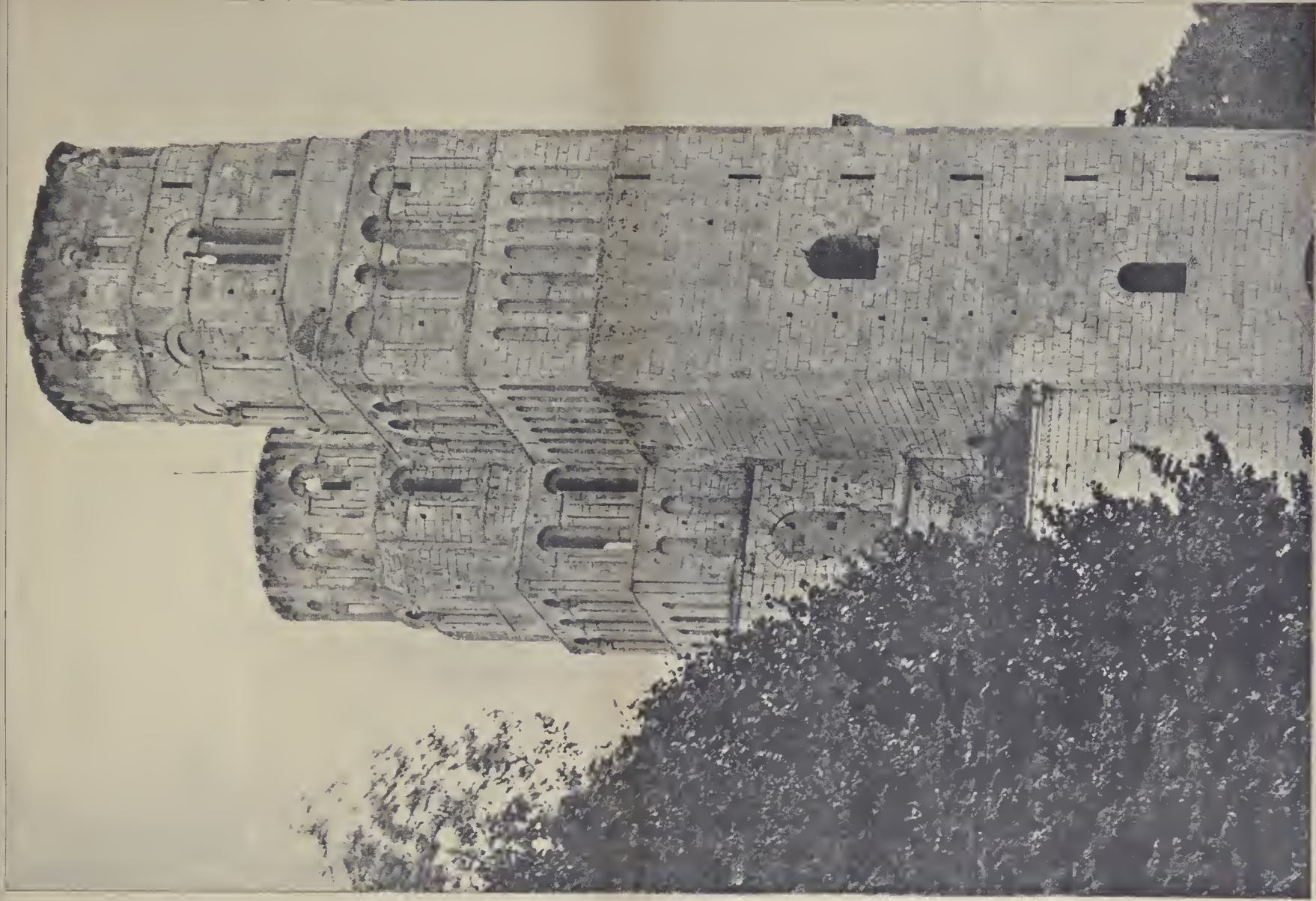
	Gross Analysis	Fresenius' Method.		CaCO_3 Method.
		Soluble in HCl.	Insol.	
	percent.	percent.	percent.	percent.
Carbonic acid ..	11.38	—	—	—
Water and organic matter ..	6.69	6.69	—	6.69
Soluble silica ..	42.33	0.49	23.32	33.01
Insoluble silica ..	—	—	18.43	9.22
Alumina	23.27	3.38	18.32	15.96
Oxide of iron ..	—	—	—	5.74
Lime	14.69	—	0.39	0.39
Carbonate of lime	—	25.09	—	25.09
Magnesia	1.47	0.31	0.61	0.92
Carbonate of magnesia ..	—	0.65	—	0.65
Sulphuric anhydride	1.30	1.30	—	1.30
Alkalies, etc. ..	—	—	1.02	1.02

THE VILLA MEDICI DRAWINGS.—As usual, the work sent from Rome by the students of the French school at the Villa Medici has been on view at the Ecole des Beaux-Arts. M. Prost, a first-year student, exhibits drawings of the Theatre of Marcellus, and some interesting fragments from Pompeii. M. Hulot has sent studies of the Forum of Nerva, and a fine water-colour of the Palatine Chapel at Palermo. M. Tony Garnier, a fourth-year student, sends drawings of a "Cité Industrielle," the details of which are both architecturally and practically interesting.



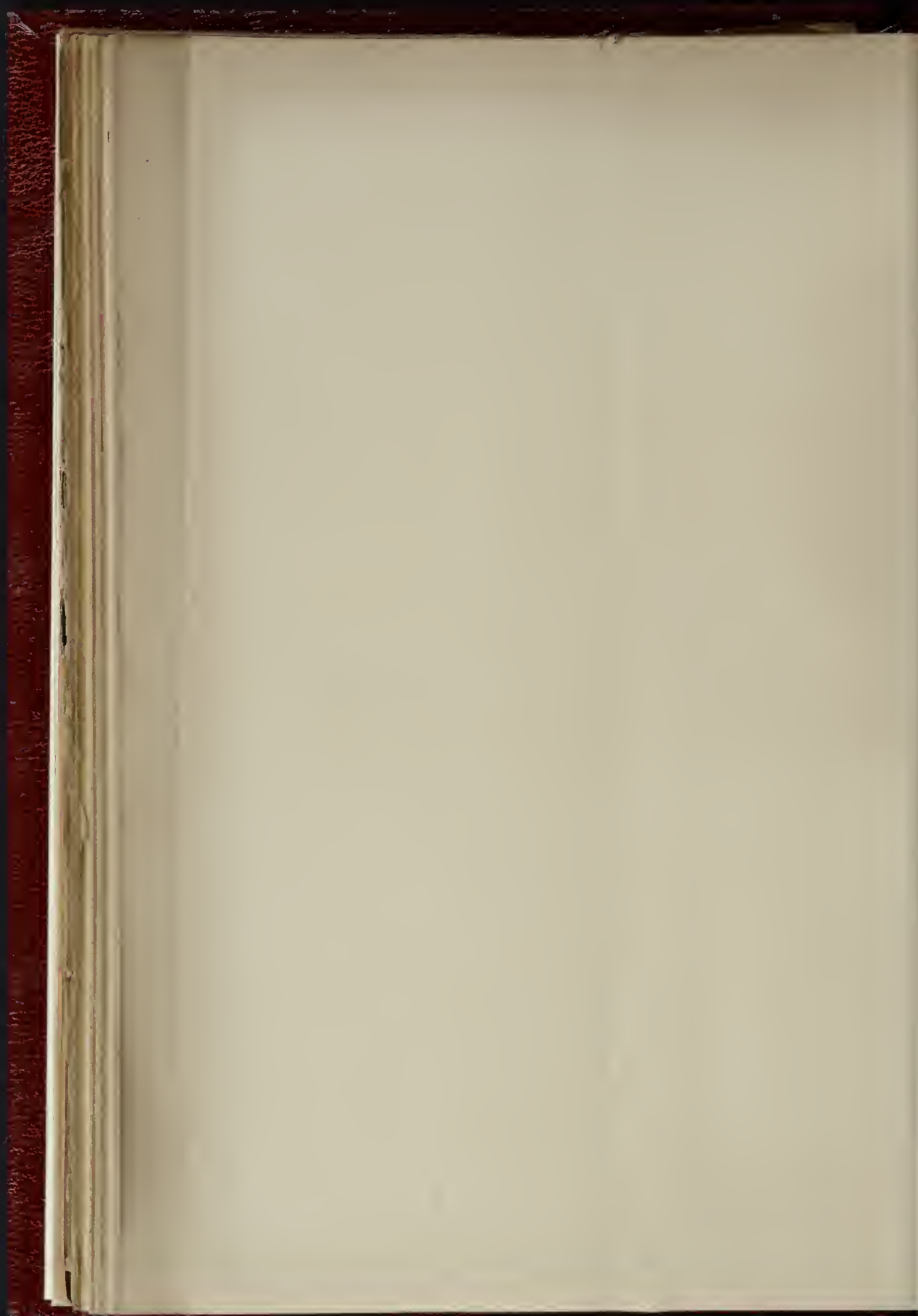
DEPTFORD
TOWN HALL,
View on Staircase
London, County of Kent



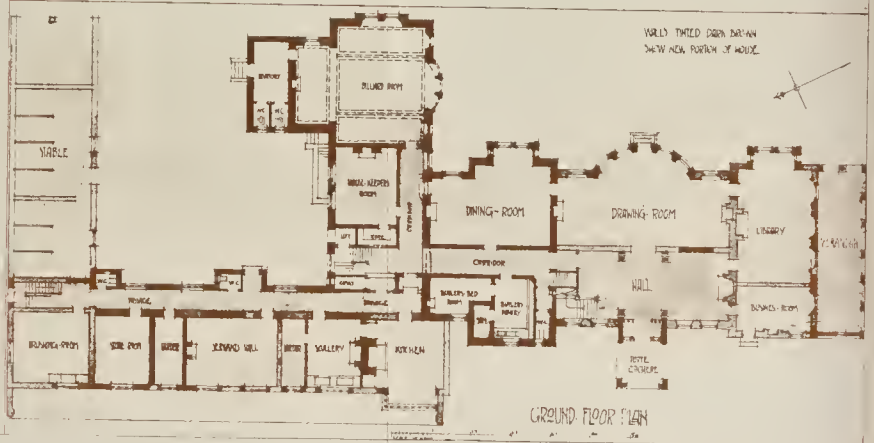


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WESTERN TOWERS, JUMIÈGES



WITHAM HALL, LINCOLNSHIRE.
AS RECONSTRUCTED





EAST ELEVATION



NORTH ELEVATION



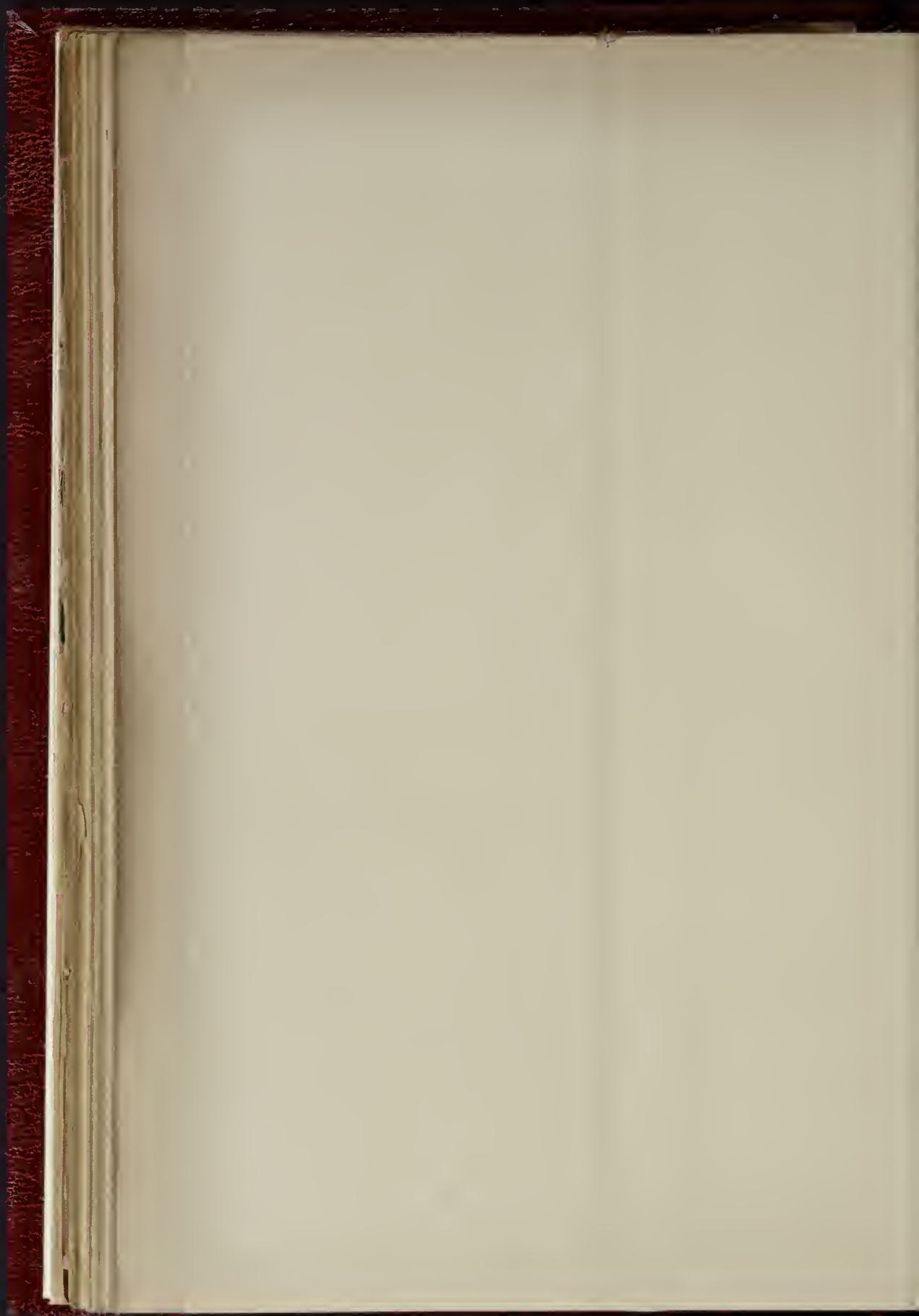
WEST ELEVATION



SOUTH ELEVATION

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METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of this Board was held on Saturday last week at the offices of the Board, Victoria Embankment. Among the correspondence received was a communication from the Local Government Board authorising the execution of certain works at Belmont Asylum at a cost not exceeding 15,000.

Darent Asylum and Western Hospital.—On the recommendation of the Finance Committee, it was agreed to apply to the Local Government Board for authority for the expenditure of 770l. on enlarging the workshops at the Western Hospital, and the rearrangement of the principal officers' accommodation at the Darent Asylum.

Leavesden Asylum.—The Asylums Committee submitted a lengthy report re the purchase of additional land at this asylum for the purpose of an extension of the sewage system. It was agreed, on the recommendation of the Committee, to apply to the Local Government Board for sanction to purchase a piece of land, 57a. 1r. 3p. in extent, adjoining the Asylum estate, at a cost of 6,000l.

High Wood School.—Plans prepared and submitted by the Engineer-in-Chief of proposed workshops at this school were approved and ordered to be forwarded to the Local Government Board.

OBITUARY.

MR. THOMAS BROWNE.—The death has just taken place of Mr. Thomas Browne, builder and joiner, at his residence in Whipcord-lane, Chester. Mr. Browne, who was a native of Liverpool, went to Chester many years ago, and followed his trade as a mason. About thirty years ago he commenced business as a builder and joiner at the Tower Wharf, and executed several large contracts in Chester and North Wales. He was well known in the city and district, and for some years served on the Town Council.

GENERAL BUILDING NEWS.

RESTORATION OF SEIGHFORD PARISH CHURCH.—This church has been reopened after restoration. The church is a very ancient one, the earliest portions—the nave, arcade, and the chancel arch—dating from the XIIth century, and the recent work has revealed several points of interest to archaeologists. One in particular is a small niche which was found contained in the wall on the south side of the chancel. There is around the niche some lettering, which is conjectured to be *Moritura in te Deus*. The church was originally Norman and Cruciform. Of this church there remain the chancel arch, the nave arcade on the north side, portions of the chancel walls, and a piscina, which has probably been built in further eastwards. The short Norman chancel, which probably terminated in an apse, was lengthened in the XIIIth century, and a priest's door was inserted. Other windows were inserted on the south side in the XIVth century, and these had again been subjected to alteration at a later period. There are clear indications at the crossing of the existence of a north transept, and it is probable that there was a central Norman tower, which fell and crushed the south side of the nave. The present south wall and western tower of brick were built in the XVIIIth century. These are of the worst possible architectural character, and it is hoped they may, in the not far distant future, be restored in a manner more in keeping with the original structure. The Bridgeford aisle, running the whole length of the north side of the church, is of late Perpendicular date, and the abolition of the former vestry at its west end has opened out the western bay of the Norman arcade. The present work of restoration has been carried out by Messrs. Collins and Godfrey, builders, of Tewkesbury, under the guidance and supervision of the architect, Mr. W. D. Caröe, of London.

The outside of the church has been repaired and restored where absolutely necessary, but it is upon the internal portion of the building that most attention has been bestowed. The stonework in the walls has been divested of cement and sham pointing. An entirely new roof of oak has been placed over the chancel, the old timbers in the nave have been cased, and bits of tracery introduced into the principal beams, and the roof over the Bridgeford aisle has also been restored. The floors have been lowered to their original level, and laid with wood blocks in place of bricks, and the passages have been laid with red tiles. The old seating has been cut down and adapted to proper dimensions, and a clergy desk has been made out of the oak remaining removed from the seats. The altar rails, originally of Charles II date, have also been slightly lowered. The old Jacobean

pulpit, which has been removed from its old place at the south-east corner of the nave to a central position between the nave and the Bridgeford aisle, has been restored. The wall which enclosed the vestry in the north-west corner of the church has been removed, the space being filled with seats, and a new vestry has been built in the north-east corner of the Bridgeford aisle. A heating vault has been erected, and a hot-water apparatus placed in the church, this work having been accomplished by Messrs. Rudge and Griffith, of Stafford. The priest's door in the chancel has been opened and restored, and the sanctuary has been tiled and enlarged. The work of rebuilding the organ was entrusted to Messrs. H. S. Vincent and Co., of Sunderland. —*Staffordshire Advertiser.*

ST. CLEER CHURCH, NEAR LISKEARD, CORNWALL.—The Church of St. Cleer was reopened, after complete restoration, on Wednesday, June 23, and the new choir stalls and roof screen were dedicated. The church is, in many respects, interesting from an architectural point of view. The original church was built in the XIIth century, and a fine old Norman door still remains in the north aisle, but the main portion of the building and the tower (which is exceptionally fine) are of XVth century work. The north arcade is of roughly-hewn granite, but the columns of the south arcade are of Polyphant stone, with beautifully-carved caps and moulded bases. The carving is exceptionally well preserved, especially considering the deplorable state in which the church was when it came into the present architect's hands. The floors were very damp and uneven, being laid directly in the ground, the steps broken and patched, and the nave and aisle roof just falling into decay. A wretched deal roof had been put on the chancel in place of the old wagon roof, and high deal boxed pews, facing in all directions, formed the seating accommodation. The present restoration has included the removal of whitewash from the stonework, restoring the nave roof and renewing the chancel roof in oak, with carved angels at the feet of the curved ribs, re-flooring the whole church with slate, and wood-block flooring in the nave and black and white marble steps and paving in the chancel and chapel, and a new roof screen right across the nave and aisles, with carved figures complete. The cost of the entire work has been about 2,500l.

The architect is Mr. Geo. H. Fellowes Pryne, of Westminster, and the builder, Mr. S. Trehane, of Liskeard, Mr. S. Pomeroy acting as clerk of works.

ST. OSWALD'S CHURCH, SHIPTON, GLOUCESTERSHIRE.—The Church of St. Oswald, Shipton Oliffe, has just been reopened after restoration. The work has been carried out under the direction of Mr. H. A. Prothero (Messrs. Prothero and Phillott, of Cheltenham), the contractors being Messrs. Collins and Godfrey, of Cheltenham, Gloucestershire.

CHURCH RESTORATION, PITCHLEY, NORTHAMPTONSHIRE.—The restoration of the parish church at Pitchley has now been completed. The work has been carried out by Messrs. Norman and Underwood, contractors, under the supervision of Mr. Holding, architect, at a cost of 1,067l.

SCHOOL, ALNWICK.—A new school has been erected at Alnwick, from the design of Mr. J. Wightman Douglas, architect, Alnwick.

COTTAGE HOSPITAL, COBHAM.—A cottage hospital is to be erected at Cobham. The plans for the work have been prepared by Mr. F. W. Bedford, architect.

NEW DISPENSARY, NOTTINGHAM.—A new dispensary is to be erected on a site in Gregory Boulevard, Nottingham. The building will comprise a waiting-ball, with consulting-room, operating-room, and dressing and dispensing rooms, with a house for the resident surgeon adjoining. The cost is estimated at from 1,500l. to 2,000l. Mr. Ernest R. Sutton, whose plans were accepted in competition, is the architect for the work.

CONVALESCENT HOME, ANCOATS.—The new convalescent home, at Sandebridge, has just been completed in connexion with Ancots hospital. The buildings have been carried out by the contractors, Messrs. Levi, Brown, and Sons, of Wilmslow, under the supervision of the architects, Messrs. Thomas Worthington and Percy S. Worthington.

NEW FACTORY, BELFAST.—A new factory has been erected for Messrs. Mayrs and Co., Ltd., in Royal-avenue, Belfast. The building is of red brick, and is three stories in height, with a flat roof for the storage and seasoning of timber. The foundations are of concrete. Mr. Allen B. Stokes, C.E., prepared the plans for the work.

EXTENSION OF THE CENTRAL STATION, GLASGOW.—The improvements to the Central Station, Glasgow, have now been completed. The whole of the works of the new extension were designed and carried out under the direction

of the Caledonian Railway Company's Engineer-in-Chief, Mr. D. A. Matheson. Mr. G. R. Storrar and Mr. H. Cunningham acted as resident engineers, and Mr. Alexander Grant was superintendent of works. The principal contractors were Sir William Arrol and Co., Glasgow; Morrison and Mason, Glasgow; James Goldie and Son, Glasgow; P. and W. Anderson, Glasgow; the Motherwell Bridge Company; P. and W. MacLellan, Glasgow; William Anderson, Glasgow; John Cochran, Glasgow; and John Orr and Sons.

KNOX MEMORIAL HALL, MONKSTOWN, IRELAND.—His Grace the Archbishop of Dublin performed the opening ceremony of the Knox Memorial Hall, Monkstown on the 28th ult. The architect of the building was Mr. Millar, the contractor being Mr. T. C. Joly, of Newtown Park, Blackrock. The hall cost nearly 4,000l.

DORMAN MEMORIAL MUSEUM, MIDDLESBROUGH.—The Dorman Memorial Museum, Middlesbrough, is situated near the principal entrance to the Albert Park. The building, a square block, is designed upon classic lines, and is placed practically in the centre of a plot of land about an acre in extent. The most important parts of the building are those devoted to the exhibition of the different classes of specimens, the space provided for this object being divided into four rooms or galleries one story in height, opening one into the other; two of these galleries are 60 ft. in length and 25 ft. in width, the other two being about 30 ft. square, each. These galleries are all lighted from the top. The roof of the first gallery is domed and lighted by a large lantern; the roofs of the other three galleries are semi-circular. The whole of the roofs are of steel construction. The front part or façade of the building is two stories in height above the ground line, with a basement floor beneath. The main entrance is in the centre of the front, and has a wide approach leading into the hall, about 20 ft. square; from this a corridor runs to the right and left, part of which will be utilised for museum space. On this level is provided the library, the curator's room, a room for hats and coats, and lavatories and other necessary accommodation, and for approach to the basement and the first floor. On the basement level there is provided a room for the preparing of special specimens, with separate access from outside, as well as other rooms for storage and for the purpose of the warming of the building. The whole of the first floor is reserved for museum space, with the exception of the provision of a room, which is intended to be used as a workshop by the curator and his assistants. The building is fireproof throughout, the floors being constructed of concrete, covered with solid wood blocks. It is warmed by open fires and by hot water, upon the low-pressure system, with radiators, through each of which is passed a current of fresh air, which is warmed before entering the several rooms. The surface of the floor of the entrance-hall and lobby adjoining is formed of Italian mosaic pavement. The building throughout will be lighted by electricity. Red brick and terracotta has been used. There is an octagonal central tower. The architects are Messrs. J. M. Bottomley, Son, and Wellburn, of Middlesbrough and Leeds. Mr. E. A. Jones has acted as clerk of the works, and Messrs. Allison Bros., of Middlesbrough, have been the builders. The cases have been made by Messrs. Marsh, Jones, Cribb, and Co., of Leeds, from the designs of the architects. The total cost of the museum building, with the site and the several fittings, will amount to between 10,000l. and 15,000l.

VICTORIA PAVILION, RAMSGATE.—The Princess Louise, Duchess of Argyll, opened the Royal Victoria Pavilion, Ramsgate, recently. The new building has been erected for the Corporation at a cost of 40,000l., and occupies a site adjoining the Royal Harbour. It has a frontage to the sands, and covers an area of 4,000 yds. The centre of the interior consists of a hall, 130 ft. long by 65 ft. wide, having a balcony on three sides, and a stage at the west end, with dressing-rooms for artists and orchestra. The proscenium has a 30 ft. opening. The architect was Mr. Stanley D. Adshear, of Bloomsbury, and the work has been carried out by Mr. F. G. Minter, of Westminster and Putney. In addition to the great hall, at either end are octagons, comprising a tea-room and buffet. Surrounding the central hall, and extending over and beyond the outbuildings, is an upper promenade, about 300 yds. in extent.

BUSINESS PREMISES, WARDOUR-STREET, W.C.—Mme. Sarah Bernhardt laid the foundation-stone a few days ago of the new premises to be built for Mr. W. Clarkson, the wig-maker, on the west side of Wardour-street, near the corner of Shaftesbury-avenue. The new building, which has been designed by

Mr. Horace M. Wakley, will be completed about the end of the year.

THE LEYSIAN MISSION BUILDINGS.—The Prince and Princess of Wales opened, on Monday, the completed portion of the new buildings of the Leysian Mission, City-road. The new buildings have been erected at a total cost of 112,000*l.* The buildings, which have been designed by Messrs. Bradshaw and Gass, and are of fireproof construction throughout, are situated at the corner of City-road and Old-street. They have a frontage to the City-road 132 ft. long and a total floor area of over two acres. The Queen Victoria hall, which is at present the only completed portion of the buildings, contains seating accommodation for 2,000 persons. In addition to the Queen Victoria hall, there are a small hall and numerous class-rooms for Sunday School work; club-rooms for men, boys, women, and girls, tea and refreshment rooms, and a drill hall and gymnasium. A medical mission is to be conducted in a detached building, and there are other rooms for the administrators of the mission.

BANK, KESWICK.—A new bank has been erected in the High Market-square, Keswick, for the Carlisle and Cumberland Banking Company. The premises have been erected on a site adjoining the old bank, and have a frontage to the street of some 36 ft. The lower part of the elevation is in red stone, and the upper part faced with the green slate stone of the district, with red stone dressings. The roof is covered with red tiles. The building is lighted by electric light throughout. The bronze hinges are from the Keswick School of Industrial Art. The work has been carried out by the following contractors:—Mr. Isaac Hodgson, builder, Keswick; Mr. Chas. Clark, joiner, Keswick; Mr. Thos. Brown, painter, Keswick; Messrs. D. Thomson and Son, plumbers, Carlisle; Mr. C. Greenwood, plumber, Keswick; Mr. J. Armstrong, electrician, Carlisle; Messrs. Cairns and Co., graters, Carlisle. The structure is from the designs and plans, and under the supervision, of Mr. J. H. Martindale, architect, Carlisle, and Mr. W. Wildman acted as clerk of the works.

COUNCIL SCHOOL, LEEDS.—A new school, erected in Argie-road, off Kirkstall-road, Leeds, was opened on the 11th inst. by the Lord Mayor. The school is part of a scheme which will eventually provide accommodation for 1,500 scholars, it being the intention of the committee, at some later date, to erect a mixed school on a portion of the site fronting Kirkstall-road, and to use the present building as an infants' school. For the present, accommodation is provided for 500 children in ten class-rooms, grouped round a central hall, six of which will be used for a mixed school, and four for infants. In addition to the main school a separate building has been erected for manual training, and this will be used as a centre for boys from other schools. The work has been carried out under the superintendence of Mr. W. S. Braithwaite, architect. The total cost of the site was 4,544*l.*, and the cost of the buildings, fence walls, and fittings, 9,122*l.*

SANITARY AND ENGINEERING NEWS.

SANITARY CONDITION OF STABLES.—In the annual report by the Liverpool Medical Officer of Health on the health of the City of Liverpool for 1903, attention is drawn to the unsatisfactory condition of stables. The number of visits of inspection made was 4,724. Conditions prejudicial to health were found in stables on account of defective construction, or of improper situation, or from neglect of lighting, ventilation, and cleansing of the stables. Under existing legal powers, great difficulty is experienced in dealing with stables, and complaints are very frequent of nuisances occasioned by the causes indicated, the most frequent, perhaps, being neglect of cleanliness. A large number of stables, it is added, are either so defective, or so little care is taken of them, that the visits of the inspectors are necessary almost every day, in order that they may be under practically constant observation. The Health Committee of Liverpool have endeavoured to procure adequate powers to enable them to make by-laws to deal with stables (a) for regulating the lighting, ventilation, cleansing, and draining; (b) for regulating the situation and mode of construction of stables to be erected within the city. Such by-laws have now been drafted and approved by the Health Committee.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. T. Martin Crippon, architect (Dundee), has removed his offices from 30, Reform-street, Dundee, to the offices at 32, Bank-street, formerly occupied by the late Mr. W.

Alexander, City Architect of Dundee, whose practice he has taken over by arrangement with the Trustees.

THE SLATE TRADE.—The make of slates for 1903 shows an increase, as compared with 1902, of 5,000 tons from slate mines (or underground quarries) and 10,000 tons from open quarries. This is, however, 25,000 tons below the average output of the last ten years. The demand for slates of good quality is brisk, and the increased output will displace an equivalent tonnage of foreign slates.

THE OLD BURLINGTON HOUSE COLONNADE.—In the House of Commons recently, in answer to Mr. MacNeill, who asked what had become of the stone colonnade formerly in front of Burlington House, Piccadilly, and removed by the Department of Works, and why it was not re-erected in one of the parks or elsewhere, Lord Balcarras replied as follows:—The colonnade is lying in Battersea Park; the question of re-erecting it is now under the consideration of the First Commissioner.

THE GUILDHALL LIBRARY, MUSEUM, AND ART GALLERY.—Amongst recent additions to the museum, the contents of which have been re-arranged and reclassified, are some remains of the Queen Eleanor cross that stood in West Cheap, opposite Wood-street, and, having been rebuilt in 1441-2 by Lord Mayor John Hatherle, was pulled down on May 2, 1643, by the Long Parliament; relics from the sites of Newgate Prison, Chamberlain's Wharf, and the New Ballic in St. Mary Axe, including a XIVth century stone figure of St. Christopher from the present site, and a sign of the "Black Boy," from a house in Fleet-lane. The Corporation have purchased the painting, "Mowing Bracken," by Mr. H. H. La Thangue, A.R.A.; Mr. Briton Riviere, R.A., has presented "The Temptation in the Wilderness," now lent to the St. Louis Exhibition; and Mr. George Gilbert has bequeathed two oil paintings, and eighty-four drawings in water-colour by his brother, Sir John Gilbert, R.A. A new catalogue of the contents of the museum is now ready, and a large amount of printed books, MSS., and maps and prints has been added to the collections in the library.

NATIONAL HOUSING REFORM CONFERENCE.—A conference, under the auspices of the National Housing Reform Council, was held at Bournville, Birmingham, on Saturday last. Councillor W. Thompson, Richmond, presided. A number of municipalities sent representatives, including, Birmingham, Manchester, Salford, Wigan, Sheffield, Brighton, York, Hull, Leeds, Bradford, and Newcastle-on-Tyne, in addition to the Liverpool Housing Association, the Citizens' Association of Manchester, the Sheffield Health Association, the Local Government Reform League, the Allotments and Small Holdings Association, Durham, the South Staffordshire and Somersetshire Miners' Associations, and other workmen's organisations. The chairman referred to the great death-rate in the large towns which was due to the want of sunshine and fresh air, and said there was an avoidable death-rate of 100,000 every year, and, in addition, they had the chain of disease and suffering which led up to it. Their desire was to lessen this by creating a more healthy public opinion. He advocated the better planning and healthful development of housing areas, remarking that whenever opportunity had been given by the provision of a cheap and frequent system of transit, there had always been a rapid rush of population to districts which had been entirely neglected. The whole of the existing by-laws should be recast and made more elastic and more adaptable to the needs of the different districts. Mr. T. C. Horsfall proposed:—

"That this conference respectfully desires to draw the attention of the President of the Local Government Board to the pressing need for (1) such measures as will effectually enable local authorities to secure that all new housing areas shall be planned to ensure an ample provision of light and air, open spaces, gardens, etc., and rendering impossible the development of new slums; (2) increased and more effective powers for dealing with the housing question in rural districts." Mr. Barlow, secretary of the Bournville Estate, seconded the motion, which was passed. Councillor Thomas Shaw, Sheffield, next proposed:—"That this conference, recognising the evils arising from bad housing conditions, desires to draw the attention of local authorities to the great value of the housing powers already possessed by them under the Housing of the Working Classes Act, 1890, 1900, and 1903, and respectfully urges that these powers should be efficiently and vigorously administered, more especially in regard to Part III. of the Act of 1890, which renders practicable the provision of suitable cottages, without any burden being placed upon the rates." Mr. Kelley, Manchester, seconded the proposition, which was affirmed.

CAPITAL AND LABOUR.

SHEFFIELD BUILDING TRADES DISPUTE.—The dispute in the Sheffield building trade, between the operative stonemasons and the master builders of the city, after lasting for about six weeks, has now been brought to a termination satisfactory to both sides. A conference was held on the 4th inst. at the Building Trades Exchange, Cross Burgess-street, of the executive of the Master Builders' Association, and a deputation from the Operative Masons' Society, augmented by two officials from the parent society in London. At this meeting an amicable settlement was arrived at, and, as the result, work has been resumed. On the two main issues—the question of permitting the introduction of hand-worked or machine-moulded stone in Sheffield, and the binding, as apprentices, of stonemasons whose compromises have been effected between the contending parties. With regard to the former, the original rule governing the trade locally was that "piece-work and sub-contracting shall not be allowed, and no worked stone shall come into the town, except flags, steps, and landings." The master builders wished to amend this, so as to read, "piece-work and sub-contracting shall not be allowed, and no hand-worked or machine-moulded stone shall come into the town, except flags, steps, and landings." The compromise now arrived at decides that no worked or partly-worked stone shall be introduced, beyond stone planed up to the square and chamfered coping, except flags, steps, and landings. With regard to the employment of apprentices, the old regulation insisted on boys being bound at the end of three months' employment, but the sons of members of the Operative Stonemasons' Society were exempt from this rule. The master builders sought to place these on the same level as other lads entering the trade. The difficulty has now been got over by a regulation which provides that sons of stonemasons "may" be bound, thus leaving the matter for individual settlement between the master builder and operative masons whose sons work with them. Of the minor questions of the dispute, the master builders desire that in winter the stonemason shall commence work at 8 a.m., having previously had breakfast. This has been acceded to by the stonemasons. This brings them into line with other branches of the building trade. The extra 4d. per hour paid to stone-setters, or fixers, which the employers objected to, will remain as before.—*Sheffield Telegraph.*

MASON'S STRIKE, GLASGOW.—The masons' strike has now entered upon its third week, and, judging from present indications, there is little hope of the dispute being settled before the conclusion of the Fair holidays. Some time ago the Lord Provost, Sir John Ure Primrose, suggested that both parties should submit the points at issue to arbitration, on the footing that the men return to work at once at the old rate—9*sd.* per hour, pending the arbiter's decision. The Master Committee are not empowered to act upon the suggestion, but in acknowledging the Lord Provost's letter, they thanked him for his kindly interest in the affairs of masters and men, remarking that they quite appreciate his hesitancy in moving in a trade dispute. It so happens that many of the masters are on holiday at present, a circumstance which has delayed the meeting to consider his proposal till July 26. A mass meeting of the men was held in the Albion Hall recently to consider the suggestion. After some discussion, the following resolution was adopted:—"That we, the operative masons of Glasgow and district, beg leave to thank the Lord Provost of Glasgow for the proffered good office but we cannot go further in the matter." It may be added that the executive committee of the operatives have decided to pay strikers money to the men signing the roll through the holidays.—*Glasgow Herald.*

Legal.

PATMAN AND FOTHERINGHAM v. PILDITCH.

In this case, which was not reported, detailed in our columns, the plaintiffs entered into a contract for the erection of a block of flats in Southampton-row, W.C., the contents of which was in accordance with the form authorised by the Institute of Architects, stated that the works were to be done according to the plans, specifications, and bills of quantities. The plaintiffs found discrepancies in the quantities, and sued the defendant for amount of such deficiency, upon the ground that the bills of quantities formed part of the contract, and that, consequently, they were entitled to be paid for the work shown on plans and specification, although not

taken in the quantities. The defendants raised the defence that the bills of quantities did not form part of the contract, but the judge gave a verdict in favour of the plaintiffs (Messrs. Patman and Fotheringham, Ltd.), and upheld their claim. As the point decided is one of importance to building owners and contractors, we think it well to put on record the judgment of Mr. Justice Channell, which was as follows:—This matter is, of course, one of considerable doubt upon the construction of this contract. The bills of quantities are incorporated into this contract in an unusual manner. It has been referred to a statement of the Master of the Rolls, in which he says, dealing, I think, with the ordinary case of a bill of quantities, that it is well understood, and that it had been settled in more than one case, that this document, the bill of quantities, where it was embraced in, and made part of, one of the other documents, whether by being in the specification or by being scheduled to the contract, or as a separate document altogether, was not, and was not intended to be, a representation to be acted on in the sense of being a warranty. Now, as regards all the instances which the Master of the Rolls gives, except as to being introduced into the contract, that, of course, is all perfectly clear. He speaks, in general words, of it being introduced by, amongst other things, a schedule to the contract. He does not say in the contract itself; and if it is introduced into the contract itself, it seems to be perfectly obvious that the operation of it depends upon the mode in which it happens to be introduced into the contract. Because it is perfectly possible, although a thing is a bill of quantities, and has been prepared as a bill of quantities, for the ordinary use of a bill of quantities, still it is possible, if the people like to incorporate that into their contract as a description of what the work is that is contracted to be done, they can do it, and, therefore, if you find it in the contract, you have got to construe the contract simply so, and say what it means; and, in this case, as in almost any other case, if one has got to deal with the way in which the courts have construed other and different contracts from the one in question, it does not afford very much help. I suppose everyone understands by this time what a bill of quantities is, and how it comes into operation. It is prepared, as a rule, by some independent person who, under a special arrangement that is made in such matters, takes the place of the builders' clerk, and if there were no such thing as making out a bill of quantities when the plans were submitted to tender, each builder would have to do it himself and have to pay his own clerk for doing it; but, for general convenience, it is done in a different way, and that man whose services, rendered before the builder knows anything about it, are adopted by the builder in each particular case, stands very much in the same position—in fact, in quite the same position as if he had been employed by the builder. I take out the quantities for him himself, although he has been employed by somebody totally different. In this particular case, the gentleman who is entering into this contract for the building to be built for him, is himself an architect. He was the architect in regard to this building, and the printed form is altered therefore from the architect engaged by the employer to the architect and employer, and, in some respects, the contract was a little bit anomalous. It does happen that he had prepared in his own office these bills of quantities; so that, it being done by him through his clerk, it is the same thing as if it had been done by himself, and I think it applies, for this purpose, to totally different characters. He is a contracting party. Also, he is the quantity surveyor. As a contracting party he has certain liabilities, and as a quantity surveyor he would take other liabilities; and certainly, if, as a quantity surveyor, there was negligence in the preparation of these quantities in that capacity, either in this action, if it is properly planned (I am told there is something to be said in reply to that), or in some other action which should be properly framed; that is if, in his capacity of quantity surveyor, he has been guilty of negligence, he will be liable, of course, for that negligence. There is no difficulty about that cause of action. The real difficulty is the main cause of action, if not the only cause of action, is set up in these pleadings, and that is the cause of action against him as contracting party. Now, as to that, we have got really to see what is the true meaning of this contract so far as regards what is the contract or work which there is a contract to do for the 17,000*l.* As a general rule, of course, the contract work is described in plans and a specification. The bill of quantities is the estimate made by some outside person as to the quantity of work which those plans and

specifications show, and, assuming that it is properly done, the works described in the bills of quantities and the works described in the plans and specification would be identical. In this case the suggestion is, and, for the purposes of argument only, has it been admitted, that they are not identical, and that there were very large discrepancies between the bills of quantities which were, in point of fact, made out, and what ought to have been the true bills of quantities upon the contract plan. Now, those being the facts, the contract is entered into in this shape. The contractor will substantially complete, etc., for the sum of 17,000*l.*, the several works required to be done in the erection of a block of flats on a site.

If it had been kept there it would have been, of course, absolutely and entirely indefinite. The next sentence is, "in a good, sound, lasting, and workmanlike manner." That is the manner, and we have not yet got the particular description turning the indefinite block into some definite amount of contract work. Then it says, "According to the plans, invitation to tender to specification and bills of quantities signed by the contractors." Now, "signed by the contractors" grammatically, and, in fact, in this case no doubt applies to all the things, although I do not suppose the invitation was signed by the contractor. It may have been. But the plans were signed by the contractors. The specification was signed by the contractors. The original bill of quantities was not signed by the contractors; but the priced bill which he gave in was. I think, therefore, that those bills of quantities signed by the contractors mean the priced bills of quantities.

Now, the question is that, following those words, "according to the plans, invitation to tender, and specification, and bills of quantities," that is, following upon an indefinite description of the work to be done, you must find the description of the work that is to be done, the thing that turns a block of flats indefinite into some definite block of flats; you must find that, somewhere or another, in these words that follow, "the plans, invitation to tender, specification, and bills of quantities." But also we have, in these four documents, to find the mode of doing the work, because that has come just before in "a sound, lasting, and workmanlike manner," according to these documents. So that you would expect these four documents would do two things:—(1) Define what the work that has to be done is, and turn the indefinite "a block of flats" into the definite block of flats; and (2) would also contain the instructions as to the mode in which the work is to be done. You would expect to find both of those somewhere or another in the four documents. Now, are you to say that some are to be looked at for some matters, and some for others, or are all of them to be looked at for both purposes? I think if there is anything material in any one of them for either of the two purposes, you must look at it for that purpose as well as for the other; that is to say, you must look at both. So far as they have got anything material to both purposes you must look at them for both purposes to define the work, and also to show the mode in which it is to be done. Now, for which purposes are you to look at the bills of quantities? The bill of quantities is the document which specially says, when you have got it incorporated like this, "what the quantity of the work is to be. Mr. Lawrence's argument is that I must deal with it in the same way as in any contract, or anything else we have to construe; that is to say, you deal with the specific things as over-riding the general ones and governing them, just as even, I think, without a clause to that effect in a contract you would say that figured dimensions over-ride some dimensions arrived at by taking the scale. Now, I think that there is great doubt about the way in which one looks at it, but on the whole, I cannot help feeling that Mr. Lawrence is right in saying that, if it was merely wanted to introduce bills of quantities for the purpose of showing the way in which the extras were to be priced, that had already been sufficiently done by clause 17, and that it was unnecessary to introduce the words, "bills of quantities" in the way in which this was done, unless it was intended to make that as the other documents with which it is coupled are a part of what the contract work was, and turning the indefinite block of flats into some definite amount of work. I confess that it is not the first time one has had experience of these building contracts, and I have always taken the view that, when the bills of quantities were introduced (and I have seen one or two cases of that sort) in this particular way, and made part of the contract, it is for the express purpose of varying the usual effect of those bills of quantities, making them part of the

contract instead of a mere estimate of what it is. My view, therefore, not arrived at by any means without doubt, is that here, so far as the bills of quantities and the plans can be put together and looked at as a thing in accordance generally with the plans, and with the quantity of work shown in the quantities, so far as that thing is possible (and I take it that it is in these matters), my view is that then the quantities provide the amount of the work, and, if in the course of doing the work the contractor is directed to exceed that amount of work for the purpose of making it accord with what it is desired to have in regard to the building, I think that then that is all extra, subject, of course, to the further things in the contract as to the mode in which it is to be done, and so on.

I think, therefore, on the whole, that it is incorporated into this contract as a part of the description of the contract work, and that, therefore, apart from any question of negligence which there might possibly be, and which would have to be dealt with in a different shape, as I have said before, if the facts for that purpose only are admitted, the plaintiff is necessarily entitled to something beyond what he has been allowed.

I say, therefore, that my judgment, subject, of course, to the reference, will be on the construction of the contract for the plaintiff. My view is that the whole of the quantities are introduced into this contract as part of the description of the contract work, and that, therefore, he is required, in order to complete the work, to do more work than is in the quantities, he is entitled to have that as an extra.

POINT UNDER THE LONDON BUILDING ACT, 1894.

THE bearing of the case of the London County Council v. Davis concluded, before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Kennedy and Phillimore, on the 12th inst., on the appeal of the London County Council from a decision of a Metropolitan police magistrate, under section 7 of the London Building Act, 1894.

Mr. Horace Avory, K.C., for the London County Council, said the question in this case was whether the respondent had formed or laid out a street within the meaning of the London Building Act. The magistrate had formed, or expressed an opinion, that the place in question was a market or bazaar, and therefore not a street within the meaning of the Act. Counsel said there was nothing in the Act about a market or bazaar. The point in the case was whether, it being a market or bazaar, prevented it being a street. In 1902 the respondent pulled down some old houses in Morgan-street, Commercial-road, and erected a large block of buildings, in the centre of which was a number of small shops. There were various entrances to them. The magistrate held that it was not a place for foot traffic within the meaning of section 7 of the Act. He was also of opinion that the shops formed a market, and not a street, within the meaning of the Act, and he dismissed the summons. The learned counsel contended that it was a street within the meaning of the Act, just the same as the Burlington Arcade was a street for foot traffic.

Mr. Macmorran, K.C., having supported the decision of the magistrate,

Mr. Avory asked the court to find that the magistrate should have found that the place was a new street, and should have imposed a penalty.

The Lord Chief Justice, in giving judgment, said that the place was commenced to be laid out as a new street about June 22. The place was about 20 ft. wide, and there were fifty-five places of business on one side and thirty-four independent shops on the other side. There were six or seven different modes of access to the buildings. Under all the circumstances, he had come to the conclusion that the magistrate had applied a wrong test. It was not a question whether a market had been established, but whether the respondent had laid out a place where people went in and out to those shops. He thought, on these facts, there was a commencing to lay out a new street in June. The place did not cease to be a street because it was used as a market.

Justices Kennedy and Phillimore concurred, and the appeal was accordingly allowed, the case being sent back to the magistrate.

POINTS OF LAW UNDER A BUILDING CONTRACT.

IN the Chancery Division, on the 6th and 6th insts., Mr. Justice Farwell had before him the case of Sharpington v. the Fulham Board of Guardians on two preliminary points of law raised by the defendants.

In this case the plaintiff, a builder and contractor, entered into a contract to convert a private house at Parson's Green, S.W., into a house for the reception of pauper children under the charge of the defendants. The contract price was £539, but this sum was afterwards increased. The contract contained a clause for the reference of disputes to arbitration. The work was completed on May 3, 1901. The plaintiff's case was that the work was delayed for thirty-six weeks beyond the contract time by reason of the defendants' acts and owing to alterations and changes made by the defendants, and that, in consequence of this, he (plaintiff) had incurred considerable expenses over and above the amount of defendants' architect's certificate. Plaintiff accordingly made an additional claim for 1,357l. Defendants disputed this claim, and the matter was referred to arbitration on November 25, 1902, the demand for arbitration being made in April, 1902. The two points of law raised by the defendants were, first, that the action would not lie under the Public Authorities' Protection Act, 1893, as the plaintiff had not commenced proceedings within six months after the acts or default complained of, nor within six months next after the ceasing thereof. The second point was that if any debt or claim was lawfully incurred by the defendants to the plaintiff in respect of the plaintiff's claim, the same was incurred or became due on or before May 3, 1901, the date of the completion of the contract, and was not paid within the half-year in which the same was incurred or became due, nor within three months after the expiration of such half-year, the commencement of such half-year being reckoned from March 30, 1901, the time when the last half-year's account was, or should have been, closed according to the order of January 14, 1867, of the Poor Law Board, and that the same could not be paid by the defendants under the Boards of Guardians (Payments of Debts) Act, 1859.

After hearing the arguments of counsel, his lordship held that the defendants' contention on both points failed. On the first point he said that the public duty in the present case was to supply a house for the reception of poor children. A breach of duty would be an injury to the poor children of the neighbourhood. The defendants had to alter the house, and they entered into a contract, and the complaint was by the contractor as a private individual of injury to himself. It was not an action in the name of the poor children of Fulham. Therefore, the defendants' contention on that point failed.

On the second point, the defendants' contention also failed, as the amount to be paid by the defendants in the present case could not be ascertained until the arbitrator had given his decision.

Mr. Upjohn, K.C., and Mr. Beddall appeared for the plaintiffs, and Mr. Butcher, K.C., and Mr. A. A. Hudson for the defendants.

CASE UNDER THE PUBLIC HEALTH ACT, 1875.

The case of Harris and others v. Scurfield came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Kennedy and Phillimore, on the 11th inst., on appeal from a decision of the Justices of Sheffield.

From the special case stated it appeared that the respondent, the Medical Officer of Health of Sheffield, had preferred an information against the appellants alleging that a nuisance arose from defective surface channels at Nos. 7 to 25 in No. 1 Court, Eyre-lane, Sheffield, and that that nuisance was caused by the default of the appellants, and had not been abated after notice given. The short facts were these:—Appellants owned eighteen houses, Nos. 7 to 25, in No. 1 Court, Eyre-lane, Sheffield. The houses were back-to-back houses, and Nos. 7 to 13 formed part of a block, and Nos. 14 to 25 were in one block. Nos. 7 to 13 faced Nos. 14 to 19, and between them was an open space of ground with a pavement on either side. Nos. 20 to 25 of the houses faced the boundary wall on the south-east side of the court, and between them and the boundary wall was also an open space of ground, with a pavement on the side thereof. The main entrance to the court was from a partially-enclosed space of ground, to which an entrance was obtained from one of the main thoroughfares. The court could also be entered by two narrow passages made between Nos. 7 to 13 of the houses. The surface channels were open, and not enclosed or covered in any way, and the slop water from the sinks of each house was carried by a separate channel cut in the pavement at right-angles to each house. There was, therefore, a separate cross-channel for each house, and a number of the cross-channels drained into each side-channel, and the drainages were by these

side-channels into two gullies in the court, and from there into the main sewer outside of the court. The use of the side-channels and cross-channels constituted a nuisance within the meaning of the Public Health Act, 1875. The Medical Officer of Health contended that each of the side-channels and cross-channels was a drain, as defined by the Act of 1875, as all the houses were premises within the same curtilage. He contended, therefore, that appellants were bound to do the work required by the notice. The appellants, however, contended that each of the side-channels was a sewer under the statute, as each was used for the drainage of more than one building, and that the premises were therefore not within the same curtilage. The Justices held that the side-channels were drains, and not sewers, and that the houses drained were premises within the same curtilage. Hence the present appeal.

At the conclusion of the arguments of counsel, the Lord Chief Justice, in giving judgment, said that the decision of the Justices could not be supported. No authority had been cited which showed that a curtilage would include this kind of combination of houses. No definition of a curtilage existed which would cover the case of a number of houses separately occupied by different people, simply because there was a common access and, to a certain extent, accommodation. He was of opinion that these houses were not houses within the same curtilage, and the appeal must be allowed with costs.

Mr. Justice Kennedy and Mr. Justice Phillimore concurred.

Mr. Danvers, K.C., and Mr. Beddall appeared for the appellants, and Mr. Montague Lush, K.C., and Mr. Waddy for the respondent.

LIABILITY FOR PAVING, ETC., CHARGES.

In the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 7th inst., judgment was delivered in the case of the Mayor, etc., of Hackney v. the Lea Conservancy Board, on the plaintiffs' appeal from a judgment of Mr. Justice Wright in the King's Bench Division.

The action was brought by the plaintiffs to recover from the defendants 300l. 2s. 6d., the amount apportioned on the defendants in respect of paving and other expenses in making good a new street, known as Maiwand-road, Clapton Park, in the Borough of Hackney, it being alleged that the defendants were liable for this amount as the owners of a strip of land bounding or abutting on that road, and forming part of the Hackney Cut navigation of the river Lea. The only question on the appeal was whether the defendants were the owners of this strip of land within the definition in section 255 of the Metropolitan Management Act, 1855.

Mr. Justice Wright held that the defendants were not the "owners" within the meaning of the section, inasmuch as they held the land "as trustees for public purposes, inconsistent with the land being rack-rented as between landlord and tenant." Therefore, the question was whether the conditions under which the defendants held the land in question were such as to support the learned Judge's conclusion. The Maiwand-road was built upon only on the side furthest from the river Lea. The land in question, which bounded the side of the road opposite to that on which the buildings were, was a retaining bank for the purpose of strengthening the bank of the Hackney Cut, and was about 26 ft. wide at the base. No houses were built upon this land, the trustees (the Lea Conservancy Board), under their powers, having purchased the land in 1849 for the purpose before stated, and it was used for that purpose and for no other purpose.

Their lordships held that there was sufficient evidence to show that the embankment, without impairing its efficiency as a protection to adjoining lands, might be made the site of a building, or might in other ways be turned to profitable account in connexion with the defendants' business. They accordingly held that the defendants were liable for the expenses, allowed the appeal, and entered judgment for the plaintiffs for the amount claimed with costs.

Mr. Macmorran, K.C., and Mr. Bevan appeared for the appellants, and Mr. Horace Avery, K.C., and Mr. E. Morten for the respondents.

NEW MARKET HALL, LEEDS.—The new market hall at Leeds was recently opened. The building has been erected from the designs of Messrs. Leeming and Leeming, architects, of London, at a cost of over 110,000l. Mr. J. T. Wright was the principal contractor for the work, and Mr. James Reid was the clerk of works.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*
13,315 of 1903.—J. and E. BATES and SONS, LTD., and A. J. BATES: *Joints of Sheet Metal Hinges*.

Hinges are usually made from a flat blank, the joints of which are formed by rolling or turning. This invention has for its main object the strengthening of the joints, which is effected by forming between a pair of dies a corrugation or reed, or a series of corrugations or reeds running along the joints, which are then rolled on and form corrugated or reeded joints which strengthen them in the weakest place, and also enhance their appearance.

14,367 of 1903.—F. L. KEPPLER: *Sash or Glazing Bars*.

A sash or glazing bar for glass roofs, and the like, wherein the bar proper is of approximately A-shape in cross-section, its upper flange being formed with four thin ribs for providing cement and screw grooves, and the lower horizontal flanges with two thin ribs for providing water gutters, said lower flanges being connected with two thin webs.

15,711 of 1903.—W. BERNSEAW, P. UELLEBERG, and A. UELLEBERG: *Door Locks*.

This relates to door locks, and consists in the construction of the locking bolt, so that in its opened position it projects into the staple plate, and the staple plate provided with recesses or openings, so as to allow the bolt to enter its opened position, or be withdrawn therefrom in its opened position, while one or two catches, held in position by spring pressure, hold the bolt fast and the door shut, so that it can be only opened by a certain pressure exerted against it, whereas the bolt and the door can be locked totally by pushing forward the bolt by a key, so that its front end projects beyond said openings or recesses in the staple plate, into an opening provided for this purpose.

16,699 of 1903.—F. H. SHORLAND: *Chimney and Ventilating Cowls*.

A chimney and ventilating cowl, for application to the outlets of ventilating shafts, chimneys, and the like, consisting of an internal shell with radial outlets, radially projecting plates, and radial shield plates, with contracted outlets arranged at each side of the outlet plates to act asaffle plates against the ingress of air.

16,879 of 1903.—J. A. GEE and J. W. BOWLEY: *Plug for Wedging into Walls, and for other purposes*.

A wall or the like plug, provided with a saw cut extending from its rear towards the front end, consisting of a binding ring at the front solid end of the plug, and a wedged-shaped piece of equal or greater length adapted to expand and compress the plug at the rear end, and to cause compression at the front end, so that the latter presents a comparatively solid compressed face.

17,403 of 1903.—C. SMITH, SONS, and CO., LTD., and J. F. MOORE: *Spring Roller Stops for Doors*.

A spring roller stop for doors, consisting in the combination of a bridge piece, adapted to be fixed in a mortise in the bottom of a door, a fork piece carried by said bridge piece, and adapted to slide up and down, a spring which presses the fork piece downwardly, a cross-pin and roller carried by said fork piece, said roller projecting for a certain distance below the base of the bridge-plate to ride over the stop-plate fixed on the floor.

17,658 of 1903.—J. JUDD and J. G. CRAIG: *Domestic Fire Escapes*.

A domestic fire escape, having a rope carriage, consisting of a cross piece, through which a rope is adapted to pass, a hinged front to enable the rope to be readily inserted, and a brake adapted to act on the rope.

17,954 of 1903.—A. J. POLLOCK: *A Toilet Cabinet applicable to Bathrooms, and the like*.

A toilet cabinet, consisting in the combination of an upper ventilated compartment, the door of which is provided with a mirror, said compartment adapted to hold tooth brushes, and other toilet requisites, and a lower compartment provided with drop lid, and adapted to hold brushes and combs.

26,161 of 1903.—G. SCHWARZ: *Construction of Baths to Facilitate the Heating*.

This relates to the construction of baths to facilitate the heating of the water, with the effect that the heating gases act directly through the casing of the bath on the water.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

The invention consists in the provision of heating channels or flues around the bath for its purpose.

2,245 of 1904.—J. POLLOCK: *The Adjustable Attachment of Handles or Knobs upon their Spindles.*

This consists in the combination or arrangement and use of means for adjustably attaching handles or knobs to spindles, comprising an internally threaded longitudinal hole in the spindle, a bushed and shouldered channel through the knob or handle, and screw threaded to engage the thread of said hole, and provided with a head fitting the larger diameter of said channel, and resting on the shoulder formed therein, and a plug closing said channel and hiding the screw.

6,969 of 1904.—P. BILLARD: *Manufacture of Imitation Ornamental Ceramic Tiles, Slabs, and the like.*

Tiles, slabs, and the like, formed of sheets of celluloid ornamental paper and plaster, cement, or the like, and in which the folded edges of the said sheets of celluloid and ornamental paper are fastened or embedded in the plaster or cement mass.

7343 of 1904.—F. NUSCH (Westentchen Thomas-Pbosphat-Werke G.m.b.H.): *Asphalt Compositions for Floors, and the like.*

A process for the manufacture of an asphalt-like floor covering, characterised by the fact that powdered slag is mixed with the melted asphalt composition in such a way that the fatty substances in the latter will admit of it, and in that proportion which is necessitated by the degree of viscosity required, whereupon such binding materials as tar, resin, oil, and the like, are added in order to enhance the receptability of the powdered slag, the rest of the process then being carried out in the usual manner, the usual filling materials such as sand, gravel, and the like, being also employed if necessary.

8,323 of 1904.—W. EMOND: *Window Holders and Fasteners for Sliding Sashes.*

This consists in the combination with a rack bar, of a housing having a shaft mounted therein, one portion of the shaft being round in cross-section, and the other portion square in cross-section, a pinion mounted upon the round portion of the shaft and adapted to engage the rack bar, a disc mounted upon the square portion of the shaft, the opposing face of the pinion and disc being radially corrugated, and a spring for holding the said corrugated faces in engagement.

9,955 of 1904.—W. SPROWSON: *Safety Gear for Lifts.*

Safety gear for rope-suspended carriages of lifts, which consists in arranging each suspension rope to descend towards the carriage, pass round a pulley or pulleys on the carriage, and ascend again, and attaching two guy ropes to each of the suspending ropes, the other end of these guy ropes being coiled round a shaft in such a manner that, when one of the vertical lengths of the aforesaid suspending rope breaks, the carriage will tend to move downwards relatively to the intact vertical length of the suspending rope, so that one of the guy ropes will be put in tension and will rotate the shaft on which it is wound, and by these means bring cams, pivoted to the carriage, to bear on vertical posts or guides so as to brake or stop the downward motion of the carriage.

10,196 of 1904.—K. RODELSTAB: *Contrivance for the Secure Shutting and Better Cleaning of Skylight Windows.*

A contrivance for the secure shutting and better cleaning of skylight windows, consisting in the combination of a hinge axle having shoulders and rods connected at their inner tie holes with said axle, and rods detachably connected at their upper ends with the window, and at their lower ends joined to fore-going rods at the point of junction with a slide bolt fitting, having a jacket in which a slit is cut with a notch cut in such slit, and a bolt having a beaded handle, and sliding in said jacket.

10,197 of 1904.—K. RODELSTAB: *Adjusting Lever Appliance for Operating Skylight Windows.*

An adjusting lever appliance for opening, fixing, and closing skylight windows, consisting in the combination of an adjusting lever having a fixed pivot whereon a draw-rod is swivelled, and a combined slot with a fixing plate having a fixed pivot, a shoulder at right-angles, and a combined slot.

10,650 of 1904.—F. W. BLAKESLEE: *Building Blocks.*

A building block, having a pair of longitudinal grooves or openings which extend beyond the middle of the block, and thereby overlap one another, one of the grooves or openings intersecting the top of the block,

and terminating short of the bottom, and the other intersecting the bottom, and terminating short of the top of the block.

10,747 of 1904.—R. BAXTER: *Sash Fasteners.*

A sash fastener, comprising a catch, consisting of a horizontal portion provided with a bevelled end, and a second lighter portion at an obtuse angle with the first portion, a base, a pivotal connexion between the catch and the base near the angle between the respective portions, and a wedge hinged to the end of said second portion extending from said end to said base.

10,974 of 1904.—A. FAHRMANN: *Mixing and Sorting Apparatus for use in the Manufacture of Bricks or the like.*

A mixing and sorting apparatus, particularly applicable for brick manufacture, comprising a receiving vessel, an end plate provided with perforations or openings for the discharge of the material treated, and a cam rotated in the interior of the apparatus and mounted in a spindle therein.

11,218 of 1904.—C. WULF: *A Process for the Manufacture of Floor Covering.*

A process for the manufacture of floor covering, according to which strips of thin absorbent paper or other suitable material are first saturated with oil colour, then dried, and afterwards painted on one side with the same colour.

15,653 of 1903.—H. PARKINSON: *Appliances for Drying, Mixing, and Preparing Tar Macadam.*

According to the invention, the appliance comprises concentric cylinders, constituting a steam jacketing, within which is another cylinder, the internal surface of which is provided with spaced vanes or blades, arranged at such distances apart, and at such angles that, when the interior cylinder is, by gear wheels, worm, or like mechanism, caused to revolve, the napping will, by the vanes, be gradually worked towards and out at the opposite end of the cylinder to which they were introduced, and thereby the tar applied to the nappings is equally distributed, and the nappings are equally coated by the tar, and as the vanes or blades do not revolve, save as part of their carrying cylinder, there is no liability of wedging, as is the case when worms or screws are employed for passing the nappings through a cylinder or mixer, and the steam jacketing ensures economical and uniform application of heat to the interior cylinder, and is more convenient than application of heat from a fire direct to the mixing cylinder as heretofore practised.

16,412 of 1903.—T. WINSTANLEY: *Process of, and Machines for, Preparing Lime and Portland Cement.*

According to this invention, the lime in its caustic state is placed upon trays, and a number of such trays are joined together so as to form an endless traveling tray conveyor. At the commencement of operations a suitable quantity of lime is placed on a tray, upon this water is sprinkled, and starts the slaking of the lime, the tray conveyor is then moved a short distance, thus bringing an empty tray to be treated in the same way as the previous one, and so on with successive trays, this process of slaking and conveying thus becoming continuous.

17,706 of 1903.—H. H. LAKE: *Construction of Beams or Girders (H. Ballinger).*

A concrete beam, provided with an iron or steel insertion, characterised by the fact that the insertion presents its greatest cross-section at that part of the beam at which the prevailing strain is greatest.

22,025 of 1903.—H. S. C. GREATORX: *Plaster Slabs or Blocks for Walls, Partitions, Buildings, and the like.*

Building blocks or slabs having one or more openings passing through them. In such openings or passages a short distance from the top of block, the horizontal length of the passages is somewhat greater than for the remainder of their depth, so that a narrow ledge is formed, upon which may be supported the ends of strips of wood or other suitable material in order that grouting or liquid cement, when poured in passages, may not pass further down. The blocks have at each vertical edge half of a similar opening to those just described, so as to form, when placed against the vertical edge of a similar block, a complete opening similar to those already described as passing through the blocks.

1,893 of 1904.—G. H. DUNLOP: *Method and Machinery for Excavating, Dredging and Transporting Earth and other materials.*

A method for excavating, dredging, and transporting earth, and other materials with a scoop, operated by three ropes from a main

power-station, and an outhaul-station, combined in one structure so that earth may be filled into the scoop by hauling it forward, transported in it by hauling it backward and deposited from it by overturning it forward.

3,005 of 1904.—G. C. SAVAGE: *Furnaces, Stoves, and Fireplaces.*

An air-feeding structure for furnaces, consisting of a casing having a partition extending substantially parallel to the front and rear walls of said casing, and dividing the same into air-feeding conduits, one of said conduits having inlet for air for primary combustion, and opening downwardly into the space below the bottom of the other conduit, and the other conduit opening near the top of the casing, a passage for admitting air to the latter conduit, said conduits being so disposed that air for supporting primary combustion is drawn downwardly and discharged into the ash-pit below the grate-bars, and the air for supporting secondary combustion is discharged into the fireplace above the burning mass of fuel.

10,139 of 1904.—E. R. PALMER: *Sanitary Inspection Chambers.*

A sanitary inspection chamber for sanitary purposes, composed of a series of superposed chamber sections of cast metal or earthenware, connected together by watertight joints, the necessary junctions and channels being cast or moulded in the bottom section.

SOME RECENT SALES OF PROPERTY:

Table with columns for location, details, and price. Includes entries like 'Southwark—6, Lan-ct., l. w.r. 322. 10s. 4505', 'Walthamstow—23 to 48 (even), Waverley-rd., u.t. 93 1/2 yrs., g.r. 80l., w.r. 352l. 16s. 1,760', etc.

<p>By HOOKER & WEBB. Hammersmith—11, The Grove, ut. 40 yrs., gr. 84, yr. 40. 4410 Worsh, Sussex—"Little Gibbshaven Farm," 3 a. 3 r. 36 p., l., yr. 20. 700 Caterham Valley, Surrey—"St. Albans," l., yr. 33. 375</p>		<p>Leytonstone—200 and 202, Hainault-rd., l., yr. 67. 6700 Walhamston—Coleridge-rd., l.g.r. 14, re- version in 93½ yrs. 325 Palmerston-rd., l.g.r. 10, reversion in 93½ yrs. 230</p>		<p>By O. F. HARRINGTON. West Ham—84, 66, and 88, Amley-rd., l., yr. 64. 10s. 6700</p>	
<p>By C. & T. MOORE. Mile End—41 to 49 (odd) Canal-rd., 60 to 73 (odd), Bridge-st., area 13,250 ft., l., r. 3. 11s. 3,200 Commercial-road, East—100 to 122 (even), Lucas-st., ut. 17½ yrs., gr. 145½, w.r. 530l. 8s. 1,250 Bethnal Green—39 and 41, Cranbrook-st., ut. 90 yrs., gr. 4½, w.r. 622. 6s. 520</p>		<p>By REYNOLDS & EASON. Westbourne-park—48, St. Ervan's-rd., ut. 42½ yrs., gr. 7, 10, yr. 10, yr. 32. 400 Balham—Endesham-rd., 4 Fern Court, ut. 4½ yrs., gr. 10, yr. 55. 2,250 Camberwell—22, 24, and 26, Mansion-st., ut. 56½ yrs., gr. 16½, w.r. 1094. 8s. 550</p>		<p>By HOBSON, RICHARDS, & CO. Bethnal Green—102, 104, 106, 112, to 124 (even), Brady-st., together with the "Alexandra Princess of Wales" p.h. plot of land, also 11 to 20, Rothen-st., and 1 to 21, 23, and 25, Dagnall-pk., l., yr. 1,500. (in one lot) 12,150</p>	
<p>By ODEN, SONS, & O'LEARY. Wimbledon—23 and 25, Princes-rd., ut. 89 yrs., gr. 14, yr. 76. 700</p>		<p>By TOWERS, ELLIS, & CO. Bayswater—3, St. Peters-burg-mews, l. p., gr. 14, p. 900</p>		<p>By STUART BAKER & CO. Croydon—246, 250, and 252, London-rd., l., er. 126l, also l.g. rents 47l. 10s., reversion in 15 yrs. 3,500</p>	
<p>By J. C. PLATT. Kensington—96, Edith-rd., ut. 71 yrs., gr. 7. 10l. 10s., er. 60l. 675 Clapham—50 and 52, Santley-st., ut. 71 yrs., gr. 120, yr. 87. 6s. 340 New Cross—148, New Cross-rd. (s.), l., yr. 42. Putney—141 and 143, Disraeli-rd., l., yr. 62. By PHILIP STOCK. Wandsworth—32, Geraldine-rd., ut. 74 yrs., gr. 7½, er. 48. 350 87, High-st. (s.), l., yr. 45. 835 27, 28, and 29, Armoury-yd., l., yr. 37½, l.s. Camberwell—119, Paul-st., ut. 63 yrs., gr. 6½, w.r. 612. 2s. 400</p>		<p>By WILLIS, CROUCH, & LEE. Fulham—5 and 7, Filmer-rd., ut. 97½ yrs., gr. 9½, w.r. 88. 8s. 630 Norwich—57 to 63 (odd), Hamilton-rd., ut. 73½ yrs., gr. 16l. 5s., yr. 124l. 10s. 725 June 24.—By LANGRIDGE & FREEMAN (at Turbridge Wells). Wadhurst, Sussex—"Green Oak" and "Dens" Estate, 365 a. 1 r. 14 p., l. and e. 5,050 By SPELMAN'S (at Norwich). Cotton, Norfolk—A freehold holding, 2 a. 3 r. 2 p. 350 Norwich—"Hoop-rd." "Fern Bank," l. p. 600</p>		<p>By E. H. EDWARDS (at Guildford). Normandy, Surrey—"Ashfield Lodge Farm," 4 a. 0 r. 38 p., l. 600 By T. W. GAZE & SON (at Ipswich). Stonham Parva, etc., Suffolk—"Westwood's Hall Estate," 249 a. 3 r. 45 p., l. 2,500 Earl Stomban, Suffolk—"Freehold farmhouse and 39a. 1 r. 7 p. 360 Mendham, Suffolk—"Kersey's Farm," 151 a. 3 r. 18 p. 1,750 Four enclosures, 25a. 0 r. 19 p., l. 250 Buxhall, Suffolk—"Fasbourn Hall Estate," 191 a. 3 r. 25 p., l. 1,700 Vyverstone, Suffolk—"Crookwell Hall Farm," 135 a. 0 r. 18 p., l. 875 Old Norton, Suffolk—"Yew Tree Farm," 49a. 0 r. 12 p., l. 1,000</p>	
<p>By NEWTON, EDWARDS, & SHEPHERD. Hoxton—1 to 11 (odd), Wilmer-gds., with limber yard, l., yr. 203. 1,925 Wilmer-gds., l.g.r. 184, reversion in 20 yrs. Hornsey—4, Millman-rd. (s.), ut. 83 yrs., gr. 122. 12s., yr. 65½. 570 5, 9 to 17 (odd), Montague-rd., ut. 83 yrs., gr. 37l. 10s., yr. 216l. 1,670</p>		<p>June 28.—By STEPHENSON & ALEXANDER (at Cardiff). Barry, Glamorgan—"Park-rd.," "Canonic," ut. 993 yrs., gr. 5s., p. 1,190 June 29.—By SURIDGE & SONS (at Bury St. Edmunds). Wheatstead, etc., Suffolk—"Bevans Farm," 150 a. 3 r. 25 p., l. p. 1,230 "Castle Farm," 129a. 1 r. 16 p., l. p. 980 June 30.—By STEPHENSON & ALEXANDER (at Cardiff). Cardiff, Glamorgan—"Queen-st. (Empire Music Hall, etc.), l.g. rents 350l., reversion in 98½ yrs. 8,500 By WALTER LUDLOW & BRISQOS (at Birmingham). Knowle, etc., Warwick—"Portions of the Pack- wood Estate (comprising six farms), 397 a. 1 r. 21 p. 6 (in lots) 17,835 Kingwood, Warwick—"Walsley Farm" estate, 94 a. 1 r. 6 p. 2,825 July 1.—By MAY & SON (at Exeter). Bow, etc., Devon—"Nymett Barton Estate," 415 acres, l. 4,000 July 4.—By BAXTER, PAYNE, & LEPPER. Beckingham, Copers (Copers), "Pembury Lodge," area 1 acre, ut. 60 yrs., gr. 27l. yr. 200l. 1,700 By G. HEAD & CO. St. John's Wood—35, 37, 39, 43, and 45, Helmstedt-st., ut. 403 yrs., l.g. 45l. yr. 220l. By ALFRED SQUIRE. Camden Town—3, 5, and 7, Bayham-st., ut. 35 yrs., gr. 60l., yr. 124l. 650 By WHITE & SON. Leith Hill, Surrey—"The "Leith Hill Hotel," l. p. 3,450 Newdigate, Surrey—A freehold cottage and shop, yr. 10l. 315 Coldharbour, six freehold cottages, yr. 56l. 6s. Coldharbour, a freehold plot of ground 130 July 4.—By NEWELL & HAMLIN. Deptford—39, Albany-st., l. w. 31l. 4s. 290 20 and 22, High-st. (s.), l., yr. 180l. New Cross—Brookley-rd., l.g.r. 2, reversion in 25 yrs. 3,530 Rokeby-rd., l.g. rents 10l. 16s., reversion in 25 yrs. 134 Brockley—Braxfield-rd., l.g. rents 39l. 5s., reversion in 71 to 73 yrs. 1,405 Arlin-rd., l.g. rents 47l. 5s., reversion in 71 and 73 yrs. 1,270 Howson-rd., l.g. rents 12l., reversion in 74 yrs. 3,275 Lingfield, Surrey—Two freehold cottages, wheelwright's shop, and 4 a. 1 r. 21 p., yr. 35l. 920 By KEMSLEY'S. Romford, Essex—"Hornchurch-rd.," "Long- field House," l. p. 1,050 By WEAVER & GREY. Strand—Tavistock-st. (hall, offices, etc.), area 2,160 ft., ut. 33 yrs., gr. 40l. p. 6,500 City of London—21, Paternoster-sq. (s.), ut. 44 yrs., gr. 18s., yr. 100l. 350 Pimlico—39, Winchester-st., ut. 26 yrs., gr. 9l., yr. 63l. 420 Highbury—12, Highbury-ter., with stabling, l. p., yr. 77l. 825 Tooting—"Tooting Bec-rd.," the "Rose and Crown," bh, l. p. (with goodwill) 6,550 July 5.—By ALAN BOOTH. Holloway—5, Middleton-rd., ut. 42½ yrs., gr. 2l., er. 55l. 620 64, Tufnell Park-rd., ut. 59½ yrs., gr. 6l. p. 460 By C. BRIDGE & SON. Haslemere, Surrey—Greyswood Hill, "Greys- wood Beches," and 4 acres, l. p. 7,000 Heathley, Hants—"Stone Hill," a freehold building site, area 10 acres 495 By DAVID BURNETT & CO. Tottenham—2, 3, and 4, Heybourne-rd., ut. 72 yrs., gr. 10l. 10s., yr. 64. 300 By G. RAWLEY CROSS & CO. Shepherd's Bush—39, Bessie Park-rd., ut. 974 yrs., gr. 9l., er. 45l. 460 By DUNGAN & KIMPTON. Wandsworth—9, Eglantine-rd., ut. 76½ yrs., gr. 7l., yr. 40l. 490 Tooting—"Micheal-rd.," "The Hollies," l. p., yr. 60. 510 By FULLER, MOON, & FULLER. Norwood—230, South Norwood-hill, ut. 51 yrs., gr. 16l. p. 300</p>		<p>By GEORGE BILLINGS. Holloway—34 to 40 (even), Brand-st., and 1 to 6, Osaburgh-cottages, ut. 61½ yrs., gr. 30l., w.r. 154l. 14s. 470 Clapham—10, and 12, Blythe-rd., ut. 32 yrs., gr. 10l., w.r. 57l. 4s. 400 Walhamston—3, Longfellow-rd., l. w. 27l. 6s. 17, Richmond-rd., l. w. 24l. 14s. 265 Victoria Park—1 and 2, Montague-bdgs. (s.), l., yr. 67l. 925 By FOSTER & GRANFIELD. Knightsbridge—Nos. 16 and 18 (s.), l., yr. 330l. 8,550 No. 20 (s.), moiety of, l., yr. 105l. 2,450 By CHAS. MANDELL. Shaftesbury-avenue—No. 161 (s.), ut. 25 yrs., gr. 46l., yr. 143l. 850 By WALTER SOYER. Camberwell—21 and 23, Kenbury-st., ut. 7 yrs., gr. 8s. 8s., w.r. 88. 8s. 150 By WM. WILLET. Ealing—Avenue-cres., "Fairfield," ut. 72 yrs., gr. 200l., yr. 700l. 790 By DEBBEL & TWEED (in con. with MATTHEWS, MATTHEWS, & GOODMAN (at Win- chester House). Woolwich, Kent—"Green's-end, etc., l.g. rents reversion in 49 yrs. 4,200 Green's-end, etc., l.g. rents 18l. 2s. 6d., reversion in 22½ yrs. 900 19 and 20, Green's-end (bank premises and a shop), l.g. rents 45l., reversion in 31 yrs. Green's-end, etc., "Elephant and Castle" bh, etc., l.g.r. 60l., reversion in 31 yrs. 3,100 Beresford-sq., l.g.r. 40l., reversion in 31 yrs. Beresford-sq., l.g. rents 82l., reversion in 29 yrs. to 57½ yrs. 2,325 Beresford-sq., "Ordnance Arms" p.h., l.g.r. 105l., reversion in 45 yrs. 3,050 Beresford-sq., l.g. rents, reversion in 31 yrs. Plumstead-rd., "Royal Mortar Hotel," a freehold rental of 150l., reversion in 45 yrs. 5,000 2, Plumstead-rd. (s.), l., yr. 32l. 1,100 Taxiway, l.g. rents 45l., reversion in 31 yrs. 19 and 21, New-rd. (s.), l., yr. 30l. 570 New-rd., the "Royal Oak" p.h., a freehold rental of 150l., reversion in 54½ yrs. 5,100 Taxiway, l.g. rents 45l., reversion in 31 yrs. reversion in 28½ yrs. 410 Spray-st., l.g. rents 46l., reversion in 1½, 20, and 30 yrs. 1,425 4 to 10, Plumstead-rd., l.g. rents, reversion in "Woolwich Infant" bh, l., yr. 340l. 9,350 Plumstead-rd., l.g. rents 12l., reversion in 10 yrs. 1,425 Parry-pk., l.g. rents 30l., reversion in 34 yrs. Spray-st., l.g. rents 41l., reversions in 11½, 32, and 68½ yrs. 3,390 29 to 30 (even), Spray-st., l., w.r. 124l. 16s. Spray-st., the "North Kent Tavern," free- hold rental of 50l., reversion in 15½ yrs. 2,250 Spray-st., l.g. rents 90l., reversion in 60 yrs. Parry-pk., l.g. rents 64l. 11s. 6d., reversion in 31 yrs. 5,100 21 and 22, Plumstead-rd., l. er. 72l., also the "Burrage Arms" p.h., l.g.r. 164, reversion in 10 yrs. 3,500 Plumstead-rd., l.g. rents 12l. 6s. reversion in 9½ yrs. 1,375 Burrage-rd., l.g. rents 45l., reversions in 2½ and 3½ yrs., yr. 77l. 4,225 Burrage-rd., the "Queen's Arms" p.h., l.g.r. 60l., reversion in 54½ yrs. 1,850 33, Burrage-rd., l., w.r. 32l. 10s., also l.g.r. 24, reversion in 4½ yrs. 675 Plumstead-rd., l.g. rents 12s. 2s. 6d., reversion in 384 yrs. 600 31, Plumstead-rd. (s.), l., yr. 32l. 900 Plumstead-rd., l.g. rents 16l., reversion in 284 and 471 yrs. 4,460 Plumstead-rd., "Essex Arms" bh, etc., l.g. rents 30l., reversion in 54½ yrs. 1,275 Plumstead-rd., l.g. rents 14l., reversion in three quarters of a year and 21 yrs. 2,250 Maxey-rd., etc., l.g. rents 17l. 12s. 6d., rever- sions in 3½ to 7½ yrs. 1,525 Burrage-rd., l.g. rents 18l., reversion in 4 yrs. 5,700 Burrage-gr., l.g.r. 12l., reversion in 98 yrs. Maxey-rd., l.g. rents 55l. 10s., reversions from 2½ to 8 yrs. 5,525 Plumstead-rd., "Sussex Arms" p.h., l.g. rents 43l., reversions from 3½ to 35 yrs. 7,675 Plumstead-rd., l.g. rents 18l., reversion in 28½ yrs. 1,750 Charlotte-st., l.g. rents 65l. 14s. 6d., rever- sions from 3½ to 16½ yrs. 6,925</p>	

Polich, Kent.—Plumstead-rd., f.g. rents 144 14s., reversion in 31 yrs.	£2,700
Plumstead-rd., etc., f.g. rents 93l. 7s., reversion from 61 to 22½ yrs.	11,425
Plumstead-rd., the "Dover Castle" p.h., f.g. r. 13l., reversion in 31 yrs.	2,100
Green's-end, f.g. rents 12s., reversion in 68½ yrs.	3,275
New-rd., f.g. r. 18l., reversion in 67½ yrs.	4,425
July 7.—By BALCH & BALCH.	
ntonville—15, Holford-sq., u.t. 28 yrs., g.r. 5l., g.r. 53l.	450
olloway—18 and 19, Penn-rd.-villas, u.t. 38 yrs., g.r. 16l., y.r. 94l.	860
By HEADLE, WOOD, & CO.	
infield.—Holwell's Elm, a freehold building site, area 3 a. 2 r. 26 p., f. p.	1,000
By CHANCELLOR & SONS.	
chmond, Surrey.—28 and 30, St. Mary's-gr., u.t. 75 yrs., g.r. 3l., y.r. 51l.	410
By DAVIS, BONSAILL, & CO.	
lham.—6, 10, and 16, Bustard-rd., u.t. 75½ yrs., g.r. 15l., w.r. 102l. 14s.	910
33, Parthenia-rd., u.t. 75½ yrs., g.r. 6l., y.r. 32l.	370
21, Maxwell-rd., u.t. 45 yrs., g.r. 5l., y.r. 31l. 16s.	225
22 and 24, Harwood-ter., u.t. 55 yrs., g.r. 6l., w.r. 62l. 8s.	430
55, Farm-la., u.t. 53½ yrs., g.r. 3l., w.r. 23l. 8s.	170
35, Coomer-rd., u.t. 67 yrs., g.r. 3l. 10s., w.r. 33l. 16s.	325
72 and 74, Coomer-rd., u.t. 61 yrs., g.r. 5l., w.r. 54l. 12s.	465
By NEWBORN, EDWARDS, & SHEPHERD.	
ing's Cross—8, Derby-st., f. y.r. 50l.	700
underwell—61, Denmark-rd., u.t. 24 yrs., g.r. 18l., y.r. 126l.	735
olloway.—Hilldrop-cres., i.g.r. 16l., u.t. 46 yrs., g.r. 2l.	260
ogert's—No. 54 (s.), u.t. 52 yrs., g.r. 42l. 10s., y.r. 100l.	950
ogert's Park—5 to 8, Cumberland-st., u.t. 20½ yrs., g.r. 47l. 10s., y.r. 130l.	430
48 and 49, Cumberland-market, u.t. 20½ yrs., g.r. 12l., w.r. 187l. 4s.	710
50, Cumberland-market, u.t. 39 yrs., g.r. 7l. 10s., y.r. 60l.	355
oke Newington.—48, Newington-green (s.), u.t. 69 yrs., g.r. 20l., y.r. 60l.	585
15, Brooke-rd., u.t. 76½ yrs., g.r. 7l., g.r. 42l.	470
4, Benthall-rd., u.t. 71½ yrs., g.r. 5l., y.r. 32l.	345
usbury Park—307, Seven Sisters-rd., u.t. 63 yrs., g.r. 32l. 11s., g.r. 120l.	825
llington.—24, Rye-st., u.t. 21 yrs., g.r. 5l., g.r. 42l.	240
By DEBENHAM, TEWSON, & CO.	
egent's Park—Avenue-rd., "Ellel Lodge" u.t. 1½ acre, u.t. 32½ yrs., g.r. nil, p.	6,000
By GUY & SONS.	
athfield, Sussex.—"Cade Street Estate," 300 a. 3 r. 7 p., f. (including timber)	8,750
"Swift Estate," 265 a. 1 r. 6 p., f.	6,900
By SIMMONS & SONS.	
ensington.—Wavick-gdns., f.g. rents 15l., reversion in 48 yrs.	1,470
72, Pembroke-rd. (s.), f., y.r. 55l.	980
Pembroke-rd., f.g.r. 10l., reversion in 48 yrs.	980
alchamstown—4, Upper Walchamstown-rd., f., g.r. 45l.	550
ockham.—14, Oakhurst-gr., f., y.r. 42l.	525
Choumert-rd., f.g.r. 8l. 8s., reversion in 28 yrs.	260

TO CORRESPONDENTS.

A. M. (Below our limit).—A. S. (Amounts should have been stated).

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PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the best Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.	
Hard Stocks.....	1 16 0 per 1000 alongside, in river.
Rough Stocks and Grizzles.....	1 13 0 " " " " " "
Facing Stocks.....	2 12 0 " " " " " "
Shippers.....	2 10 0 " " " " " "
Flettons.....	1 10 0 " " " " " "
Red Wire Cuts.....	1 13 0 " " " " " "
Best Fareham Red.....	3 12 0 " " " " " "
Best Red Pressed.....	5 0 0 " " " " " "
Hudson Facing.....	5 0 0 " " " " " "
Best Blue Pressed.....	4 4 0 " " " " " "
Staffordshire.....	4 10 0 " " " " " "
Do. Bulhouse.....	4 10 0 " " " " " "
Best Shourbridge.....	4 8 0 " " " " " "
Fire Bricks.....	4 8 0 " " " " " "
GLAZED BRICKS.	
Best White and Ivory Glazed.....	13 0 0 " " " " " "
Stretchers.....	13 0 0 " " " " " "
Headers.....	12 0 0 " " " " " "
Quoins, Billhouses, and Flints.....	17 0 0 " " " " " "
Double Stretchers.....	19 0 0 " " " " " "
Double Headers.....	16 0 0 " " " " " "
One Side and two Ends.....	19 0 0 " " " " " "
Two Sides and one End.....	20 0 0 " " " " " "
Splays, Chamfered, Squibs.....	20 0 0 " " " " " "
Best Dipped Salt.....	2 0 0 " " " " " "
Glazed Stretchers and Header.....	12 0 0 " " " " " "
Quoins, Billhouses, and Flints.....	14 0 0 " " " " " "
Double Stretchers.....	13 0 0 " " " " " "
Double Headers.....	14 0 0 " " " " " "
One Side and two Ends.....	15 0 0 " " " " " "
Two Sides and one End.....	15 0 0 " " " " " "
Splays, Chamfered, Squibs.....	14 0 0 " " " " " "
Second Quality White and Dipped Salt.....	2 0 0 " " " " " "
Glazed.....	2 0 0 " " " " " "

Thames and Pit Sand..... s. d. 7 3 per yard, delivered.

Thames Ballast..... 6 0 " " " "

Best Portland Cement..... 90 0 per ton, " "

Best Ground Blue Lias Lime 21 0 " " " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.

Stroubridge Fireclay in sacks 27s. 6d. per ton at rly. dep't.

STONE.

BATH STONE—delivered on road waggons, s. d. Paddington Depot.....	1 6½ per ft. cub.
Do. do. delivered on road waggons, Nine Elms Depot.....	1 8½ " " "
Portland Stone (20 ft. average) delivered on road waggons, Paddington depot, Nine Elms depot, or Pimlico Wharf.....	2 1 " " "
White Basobed, delivered on road waggons, Paddington depot, Nine Elms depot, or Pimlico Wharf.....	2 2½ " " "
Ancaster in blocks..... s. d. 1 11 per ft. cube, deld. rly. dep't.	
Beer.....	1 6 " " "
Greenhill.....	1 10 " " "
Barley Dale in blocks.....	2 4 " " "
Hed Corsehill.....	2 5 " " "
Cloesburn Red Freestone 2 0 " " "	
Red, Mansfield.....	2 4 " " "

STONE.—(continued).

YORK STONE—Robin Hood Quality.	
Scrapped random blocks 2 10 per ft. cube, deld. rly. dep't.	
6 in. sawn two sides landings to sizes (under 40 ft. super.) 2 3 per ft. super. "	
6 in. rubbed two sides ditto, ditto.....	2 6 " " "
3 in. sawn two sides slabs (random sizes) 0 11½ " " "	
2 in. to 2½ in. sawn one side slabs (random sizes) 0 7½ " " "	
1½ in. to 2 in. ditto, ditto 0 6 " " "	
HARD YORK—	
Scrapped random blocks 3 0 per ft. cube, 6 in. sawn two sides landings to sizes (under 40 ft. super.) 2 8 per ft. super. "	
ditto.....	3 0 " " "
3 in. sawn two sides (slabs random sizes) 1 2 " " "	
2 in. self-faced random flags.....	0 5 " " "
Hopton Wood (Hard Bed) in blocks 2 3 per ft. cube, deld. rly. dep't	
" " " " 6 in. sawn both sides landings 2 7 per ft. super. deld. rly. dep't	
" " " " 3 in. do. 1 2½ " " "	

SLATES.

in. in. £ s. d.	
20 x 10 best blue Bangor 13 2 6 per 1000 of 1200 at r. d.	
20 x 12 " " " " " " " " " "	13 17 0 " " "
20 x 10 first quality " " " " " " " " " "	13 0 0 " " "
20 x 12 " " " " " " " " " "	13 15 0 " " "
16 x 8 " " " " " " " " " "	7 5 0 " " "
20 x 10 best blue Portmadoc.....	12 12 6 " " "
16 x 8 " " " " " " " " " "	6 12 6 " " "
20 x 10 best Eureka un-fading green.....	15 17 6 " " "
18 x 12 " " " " " " " " " "	13 7 6 " " "
18 x 10 " " " " " " " " " "	13 5 0 " " "
16 x 8 " " " " " " " " " "	10 5 0 " " "
20 x 10 permanent green 11 12 6 " " "	
15 x 10 " " " " " " " " " "	9 12 6 " " "
16 x 8 " " " " " " " " " "	6 12 6 " " "

TILES.

Best plain red roofing tiles. 42 0 per 1000 at rly. dep't.	
Hip and Valley tiles.....	3 7 per doz. " " "
Best Brocely tiles.....	50 0 per 1000 " " "
Do. Ornamental tiles.....	52 6 " " "
Hip and Valley tiles.....	4 0 per doz. " " "
Best Rubion red, brown, or brindled do. (Edwards) 57 6 per 1000 " " "	
Do. Ornamental do.....	60 " " "
Hip tiles.....	4 0 per doz. " " "
Valley tiles.....	3 0 " " "
Best Red or Mottled Staffordshire do. (Peakes) 51 9 per 1000 " " "	
Do. Ornamental do.....	54 6 " " "
Hip tiles.....	4 1 per doz. " " "
Valley tiles.....	3 5 " " "
Best "Rosemary" brand plain tiles..... 48 0 per 1000	
Best Ornamental tiles.....	50 0 " " "
Hip tiles.....	4 0 per doz. " " "
Valley tiles.....	3 8 " " "
Best "Hartsill" brand plain tiles, sand faced. 50 0 per 1000	
Do. pressed.....	47 6 " " "
Do. Ornamental do.....	50 0 " " "
Hip tiles.....	4 0 per doz. " " "
Valley tiles.....	3 6 " " "

WOOD. At per standard.

Deals: best 3 in. by 11 in. and 4 in. 2 a. d. 2 a. d. by 9 in. and 11 in.....	15 10 0 16 10 0
Deals: best 3 by 4.....	14 10 0 15 10 0
Battens: best 2½ in. by 7 in. and 3 in. and 3 in. by 7 in. and 8 in.....	11 10 0 12 10 0
Battens: best 2½ by 6 and 3 by 6.....	0 10 0 less than 7 in. and 8 in.
Deals: seconds.....	1 0 0 least 10 best
Battens: seconds.....	0 10 0 " " "
2 in. by 4 in. and 2 in. by 6 in.....	0 0 0 9 10 0
2 in. by 4½ in. and 2 in. by 5 in.....	8 10 0 9 10 0
Foreign Sawn Boards—	
1 in. and 1½ in. by 7 in.....	0 10 0 more than battens.
3 in.	1 0 0 " " "
At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification) 4 10 0 5 0 0	
Seconds.....	4 5 0 4 10 0
Small timber (8 in. to 10 in.).....	3 12 6 3 15 0
Small timber (6 in. to 8 in.).....	3 0 0 3 10 0
Swedish harks.....	2 15 0 3 0 0
Pitch-pine timber (20 ft. average) 3 3 0 3 15 0	

JOINERS' WOOD. At per standard.

White Sea: first yellow deals, 3 in. by 11 in.....	23 0 0 24 0 0
3 in. by 9 in.....	21 0 0 22 0 0
Battens, 2½ in. and 3 in. by 7 in.....	17 0 0 18 0 0
Second yellow deals, 3 in. by.....	
11 in.....	18 10 0 20 0 0
3 in. by 9 in.....	17 10 0 19 0 0
2 in. and 3 in. by 7 in.....	13 10 0 14 10 0
Third yellow deals, 3 in. by 11 in.....	
11 in.....	15 10 0 16 10 0
3 in. by 9 in.....	15 10 0 16 10 0
Battens, 2½ in. and 3 in. by 7 in.....	
11 in.....	12 10 0 13 10 0
Petersburg: first yellow deals,	
3 in. by 11 in.....	21 0 0 22 10 0
Do. 3 in. by 9 in.....	18 0 0 19 10 0
Battens.....	13 10 0 15 0 0
Second yellow deals, 3 in. by.....	
11 in.....	16 0 0 17 0 0
Do. 3 in. by 9 in.....	14 10 0 16 0 0
Battens.....	11 0 0 12 10 0
yellow deals, 3 in. by.....	
11 in.....	13 10 0 14 0 0
Do. 3 in. by 9 in.....	13 0 0 14 0 0
Battens.....	10 0 0 11 0 0
White Sea and Petersburg—	
First white deals, 5 in. by 11 in. 14 10 0 15 10 0	
" " " " 3 in. by 9 in. 13 10 0 14 10 0	
Battens.....	11 0 0 12 0 0

MEETINGS.	
FRIDAY, JULY 15.	
Incorporated Association of Municipal and County Engineers.—Thirty-first Annual General Meeting, at Aylesbury (continued).	
SATURDAY, JULY 16.	
Incorporated Association of Municipal and County Engineers.—Thirty-first Annual General Meeting (contd.).	
Institute of Sanitary Engineers.—Visit to Tunbridge Wells.	
WEDNESDAY, JULY 20.	
Institute of Sanitary Engineers, Ltd.—(1) Election Committee at 3 o'clock. (2) General Purposes and Finance Committee at 5 o'clock.	
Builders' Foremen and Clerks of Works' Institution.—Monthly Meeting of the members. 8 p.m.	
THURSDAY, JULY 21.	
Institution of Heating and Ventilating Engineers.—Meeting at St. George's Hotel, Lime-st., Liverpool. General Meeting at 2.30, and Dinner at 10.30, the General Meeting at 2.30, and Dinner at 10.30.	
Institution of Mechanical Engineers.—Conversationale.	
FRIDAY, JULY 22.	
Institution of Heating and Ventilating Engineers.—The members will meet at the St. George Hotel at 10 o'clock on Friday the 22nd to visit one of the Atlantic liners, launching thereafter at the St. George Hotel at 1 o'clock. After lunch there will be a cruise on the river, starting at 2.45.	
Institution of Mechanical Engineers.—Ordinary General Meeting. Mr. George G. Hillier on "Design and Test of a Modern Steam-Power Plant."	
Junior Institution of Engineers.—Visit to Messrs. Bryant & May's Match Manufactory, Fairfield Works, Fairfield, Bow. Trains with carriages reserved for members, and refreshments at 2.50 p.m.	
SATURDAY, JULY 23.	
Architectural Association.—Visit to Hatfield House;	

ERITH.—For painting, repairs, etc., at public elementary schools, for the Education Committee. Mr. W. Egerton, architect, 12, Queen's-road, Erith:—
Central Schools, West-street, Erith.
 H. Vaughan £405 0 0
 F. Spencer & Son 182 1 0
 G. H. Gunning & Sons, The Mount, Erith* 178 18 6
Piardy Schools, Belvedere.
 F. Spencer & Son, Erith* 190 9 6
Bealwell-road Schools, Northumberland Heath, Belvedere.
 H. Vaughan £140 0 0
 G. Finney & Son 41 9 6
 G. Wymann 36 0 0
 W. G. Hellyer 34 10 0
 G. H. Gunning & Sons, Erith* 25 18 0

FARHAM.—For the extension of water mains, for the Urban District Council. Mr. Walter Butler, Engineer, Common Offices, Quay-street, Farham:—
 W. Ward £2,826 0 0
 W. Radford £2,735 12 6
 H. Plummer £2,674 0 0
 Cunningham & Forbes £2,210 11 2
 Co. £2,210 11 2
HENDON.—For reconstruction of main outlet sewers, Cannon's-lane, Pinner, for the Rural District Council. Mr. J. A. Webb, Engineer, Stanmore:—
 D. Seaman £3,046 4 3
 C. Ford £2,994 0 0
 G. Whipsey £2,802 8 10
 H. Brown £2,464 0 0
 G. G. Rayner £2,350 15 8
 C. W. Kibling-back & Co. £2,348 14 10
 A. B. Champ-niss £2,348 0 0
 E. T. Bloom £2,218 6 5
 G. Harber £2,026 10 3
 East Ham* £2,026 10 3

HENDON.—For fully making-up Rowsley-avenue, Hendon, for the Urban District Council. Mr. S. Slater Grimley, Engineer:—
 R. Ballard, Ltd. £556 15 3
 F. Fowles 843 15 6
 A. B. Champniss 797 15 0
 T. Adams, Wood Green* 792 8 6

HENDON.—For a pair of workmen's cottages, Brent Farm, Hendon, for the Urban District Council. Mr. S. Slater Grimley, Engineer and Surveyor:—
 W. S. Bushnell £504 0 0
 W. Toot £477 10 0
 F. E. King* £477 10 0

HULL.—For erecting additional classroom at West Dock-avenue Council School, for the Education Committee. Quantities by the City Architect:—
 Hull General Builders, Ltd. £643 15 8
 Barker & Son 634 6 6
 G. Jackson & Sons 598 0 0
 J. Thompson & Co. 608 11 11
 G. Blackburn 568 0 0
 J. Boyce 555 1 7
 H. T. Arnott 536 16 0
 G. Houlton 534 0 0
 Executors of J. E. Train 523 18 0
 M. Harper 507 17 0
 Executors of T. Southern 489 3 3
 J. Morrell & Sons 483 12 0
 J. H. Fenwick 480 0 0
 J. Simpson & Son 476 13 11
 E. Good & Sons, Ltd. 470 0 0
 J. R. Woods 447 17 1
 H. J. Kirkwood 410 18 6
 F. Bellby, St. George's-road, Hull* 439 0 0

LANCASTER.—For re-building No. 31, Penny-street, for Mr. J. W. Gorrill. Mr. J. Parkinson, architect, Lancaster. Quantities by architect:—
Masonry. W. Harrison's Executors, Lancaster £677 11 3
Joinery. R. Thompson, Lancaster
Slating and Plastering. Gardiner Bros., Lancaster
Plumbing and Glazing. Harrison & Moser, Lancaster
Painting. Meadowcrofts, Lancaster

LEAVENWORTH.—For erecting twenty-two cottages for married attendants at Leavenworth Asylum, near Watford, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-chief. Quantities by Messrs. W. H. Barber & Son, 22, Buckingham-street, Adelphi, W.C.:—
 G. W. Johnson £9,850
 S. H. Rouders & Matthews 8,328
 Martin, Wells & Co., Ltd. 8,275
 East & Hyde 7,999
 Chas. Wall, Ltd. 7,983
 Gardner & Hazell 7,961
 Aldridge & Son 7,986
 Oak Building Co., Ltd. 7,785
 Wm. Judge 7,600
 J. J. Goss 7,560
 F. J. Goss 7,390
 W. D. Wilkins £7,287
 H. Kent 7,250
 A. Faulks 7,240
 H. Martin 7,142
 G. & J. Waterman 7,134
 Bracey & Clark 6,988
 Clark Bros. 6,947
 J. Honour & Son 6,900
 J. Whitnour & Sons 6,880
 Vall & Williamson 6,846
 G. Wiggs, 90, St. Alban's-road, Watford 6,800
 G. Wiggs, 90, St. Alban's-road, Watford 6,600

LEYTON.—For laying tar-paving to playgrounds at Farmer-road School, and repairs and redressing of tar-paving at two schools, for the Education Committee. Mr. W. Jacques, architect, 2, Fen-court, Fenchurch-street, E.C.:—
Farmer-road School Tar-paving.
 Goddard & Co. £1,032 14 8
 North of England Asphalt Co. 932 14 8
 Hohman & Co. 860 0 5
 Constable & Co. 845 0 0
 Wainwright & Co. 723 8 0
 La Brea Asphalt Co., Birmingham* 623 9 4

Redressing Tar-paving Capworth-street and Mayville-road Schools.
 Capworth-street £108 1 3
 Mayville-road £84 12 3
 Constable & Co. 158 0 0
 Goddard & Co. 43 15 0
 Hohman & Co. 65 0 0
 J. Smart 63 0 9
 Wainwright & Co., Belgrave road, S.W.* 46 15 6

LEYTON.—For improvements to exits of seven schools, for the Education Committee. Mr. W. Jacques, architect, 2, Fen-court, Fenchurch-street, E.C.:—

	Downsell-road.	Harrow-green.	Kirkdale-road.	Lea Bridge-road.	Mayville-road.	Ruckholt.	Trumpington-road.
F. J. Coxhead	£ 32 5 0	£ 29 0 0	£ 137 0 0	£ 10 1 0	£ 17 0 0	£ 17 0 0	£ 13 0 0
Greaves & Son	45 0 0	35 10 0	127 10 0	8 15 0	12 7 0	16 0 0	27 15 0
S. Kind	—	39 0 0	—	10 5 0	—	—	—
W. J. Maddison	56 1 8	47 15 0	196 11 6	20 15 0	24 15 0	31 5 0	32 15 0
Proctor & Son	32 10 0	44 0 0	156 0 0	13 0 0	17 10 0	26 0 0	9 5 0
Vigor & Co.	40 0 0	52 10 0	—	29 0 0	30 0 0	50 0 0	20 0 0
Woolaston Bros.	—	—	—	—	—	—	—

LEYTON.—For cleaning, painting, repairs and improvements to schools, and erecting boundary-walls to Church-road School, etc., for the Education Committee of the District Council. Mr. W. Jacques, architect, 2, Fen-court, Fenchurch-street, E.C.:—
Newport-road School—Painting Drill Hall Roof, and Improvements to Girls' staircase and Exits.
 Vigon & Co. £215 0 0
 S. Kind £165 0 0
 Greidman & Co. £10 10 0
 Proctor & Son £207 0 0
 Wollaston & Co. £160 0 0
 H. Wilson 203 0 0
 F. J. Coxhead 152 0 0
 W. J. Maddison 178 0 0
 Leytonstone* 152 0 0

Painting Exteriors, etc., Church-road and Goodall-road Schools.
 Church-road. Goodall-road.
 R. Athey £229 10 6
 £268 9 6
 Chapman & Sturton 177 0 0
 £200 0 0
 A. E. Clark 226 0 0
 £195 0 0
 F. J. Coxhead 343 0 0
 £263 0 0
 Gregar & Son 187 0 0
 £193 0 0
 H. C. Horswill 153 0 0
 £153 0 0
 W. J. Maddison 254 0 0
 £223 0 0
 Proctor & Son 207 0 0
 £215 0 0
 Stedman & Co. 214 0 0
 £222 0 0
 Vigor & Co. 140 0 0
 £160 0 0
 Woolaston Bros., Stratford 275 0 0
 £216 0 0
 Woolaston & Co. 285 0 0
 F. J. Coxhead £152 0 0
 S. Kind 275 0 0
 Vigor & Co. 142 0 0
 Proctor & Son 188 0 0
 W. J. Maddison 138 0 0
 Woolaston Bros. 188 0 0
 Stedman & Co. 138 0 0
 H. C. Horswill 160 0 0
 W. Gregar & Son 160 0 0
 H. Wilson 160 0 0
 W. Gregar & Son 124 0 0

LITTLEHAMPTON.—For providing and laying 450 yds. of 3-in. cast-iron water mains, etc., for the Urban District Council. Mr. H. Howard, Surveyor, Town Offices, Littlehampton. Quantities by Surveyor:—
 D. & J. Hall, £201 4 10
 M. W. e h b,
 D. & A. Ockenden, 175 0 0
 Stoke Newington* £147 11 3

LIANTEGLOS-BY-POWEY.—For constructing 584 ft. of 9-in. stoneware and 126 ft. iron sewers, and five manholes and two ventilators, at Polruan (total, 710 ft.), for the Liskeard Rural District Council. Mr. Edwin Mallett, Sanitary Inspector, Penzance, Duloe, R.S.O., Cornwall:—
 T. Doney £129 12 10
 S. Libby, Pol-ruan, Powey* £108 16 6
 J. Hooper 124 18 5

LONDON.—For painting and decorating Hoxton Public Library in Pittfield-street, for the Shoreditch Borough Council. Mr. J. Rush Dixon, Borough Surveyor, Town Hall, Old-street, E.C.:—
 A. Jagers £584 0 0
 G. Keetch £436 0 0
 Cone & Smith 560 5 0
 J. Ivory 434 0 0
 Wallace & Co. 547 15 0
 A. G. Rossiter 426 0 0
 Sabeys & Son 523 0 0
 G. & Co. 425 10 0
 Geric & Son 503 15 0
 W. J. Braby 425 10 0
 T. Tranter & Haslewood 480 1 0
 W. King & Son 418 5 0
 R. Schooley & Co. 450 0 0
 G. D. Pearce 395 0 0
 F. W. Hardy 476 5 4
 J. McArthur & Fowler & Co. 475 0 0
 Co. 343 10 0
 Woolaston Bros. 462 0 0
 C. Cruise 334 0 0
 P. M. Marby 305 0 0
 Campbell & Christmas 458 0 0
 J. Scott Penn 264 19 0
 W. Read 456 0 0
 B. E. Nightingale 315 0 0
 J. Kirkcaldy 415 0 0
 G. Gale, Albert Harrods, Ltd. 440 0 0
 Embankment* 239 0 0
 (Borough Surveyor's estimate, £420.)

LONDON EDUCATION COMMITTEE TENDERS.
 For painting or cleaning schools during summer holidays, 1904:—
Hammersmith, Addison-gardens (Painting Interior and Exterior).
 Holloway Bros. £429 15 0
 (London) Ltd. £530 0 0
 S. Polden 465 0 0
 Spencer, Sauts, & Co., Ltd. 462 0 0
 W. H. & A. Hyde 435 15 0
 F. T. Chichen & Co. £429 15 0
 W. Hornett, 17, Houghton-street, Strand, W.C.* 416 0 0
Battersea, Battersea Park-road (Painting Exterior).
 R. Carmichael £240 0 0
 Rice & Son £153 0 0
 J. A. Jewell 219 0 0
 Lathley Bros. 152 0 0
 E. Flood 203 0 0
 J. Garrett & Son 142 0 0
 R. S. Renouf 180 0 0
 E. Trites, 92 The W. Johnson & Co., Ltd. 164 10 0
 S.W.* 129 0 0
Poplar, British-street (Cleaning Interior).
 W. Hayter & Son £269 10 0
 W. J. Howie £194 0 0
 W. Banks 212 17 6
 Blackheath-rd., Greenwich, S.E.* 179 0 0

Westminster, Ducking-gate (Painting Exterior).
 W. King & Son £340 0 0
 R. Sims, 58-60, Leonard & Mason 138 0 0
 Horsley-road, E. P. Bull & Co. 120 0 0
 Westminster, W. Chappell 115 0 0
 S.W.* 98 0 0
 W. J. Coleman & Co. 105 6 0
E. St. Pancras, Great College-street (Painting Exterior).
 Patman & Potheringham, Ltd. £248 1 0
 136, Highgate-road, N.W.* £212 0 0
 F. Bull 225 0 0
 T. Cruwys 218 0 0

E. St. Pancras, Camden-street (Special) and Medburn-street (Junior Boys) (Painting Exterior).
 Patman & Potheringham, Ltd. £219 0 0
 Marchant & Highgate-road, N.W.* 76 0 0
 T. Cruwys 96 9 6
 F. W. Harris 89 0 0
 Whitechapel, Chickensand-street (Painting Exterior).
 J. F. Holliday £272 0 0
 J. Haydon & Sons, 50, Teesdale-street, Hackney-road, N.E. £215 8
 H. C. Crooks £268 10 0
 W. J. Mitchell & Son £119 0 0
 H. J. Williams 186 0 0
 J. & C. Bowyer 187 0 0
 E. P. Bull & Co. 167 0 0
 Westwood-street, Upper Norwood, S.E.* 113 0 0
 C. J. Jerrard 165 0 0

Dulwich, Grove-vale (Painting Interior and Exterior).
 Leonard & Mason £596 0 0
 J. & C. Bowyer £364 0 0
 W. V. Good 490 0 0
 Proctor & Son 492 0 0
 High-street, Plumstead, S.E.* 249 0 0
 W. Sayer & Son 454 0 0
 H. Liney & Son 447 0 0
 H. Line 380 0 0
Leisham, Hither-green (Painting Exterior, omitting portions affected by sanitary alterations).
 W. Banks £284 10 0
 J. & C. Bowyer 230 0 0
 Westwood-street, Upper Norwood, S.E.* £177 0 0
 W. J. Howie 208 0 0
 Upper Norwood, S.E.* £177 0 0

Greenwich, Hughes'-fields (Painting Exterior).
 P. S. Howard £211 15 0
 H. Groves, W. Banks 197 15 6
 Stockwell-st., Greenwich, S.E.* £152 0 0
 W. J. Howie 183 0 0
 S. Musgrove 171 15 10
 C. G. Jones 157 17 0

Peckham, Leydale-road (Painting Interior).
 Leonard & Mason £292 0 0
 H. Groves 274 17 6
 W. Banks 274 17 6
 J. & C. Bowyer 349 0 0
 C. G. Jones 257 0 0
 W. Read 327 0 0
 H. Line, 185, Upper Thames-street, E.C.* 249 0 0
 Holliday & Greenwood, Ltd. 317 0 0

Hackney, Lamb-lane Special School and Hackney Correspondents' Office (Cleaning Interior of School and Painting Interior of Correspondents' Office).
 H. Bouneau £95 13 0
 Vigor & Co. £83 0 0
 G. Barker 91 0 0
 C. Willmott & Sons, H. Runham Brown 88 0 0
 Hitchin, Herts. 69 15 0
Orchard, Lombard-wall (Painting Exterior).
 P. S. Howard £285 15 6
 W. J. Howie, Blackheath-road, Green- wick, S.E.* £237 0 0
 E. Proctor & Son 238 0 0
 S. Musgrove 248 7 6
 W. J. Howie, Blackheath-road, Green- wick, S.E.* £237 0 0

S. Paddington, Moberly (Painting Interior B, G, and I, and Cleaning Interior Special School).
 Thompson & Beveridge £276 0 0
 F. Chidley & Co. 295 0 0
 Marchant & Hirst 488 0 0
 A. Balfour & Co., 42, Kingsley-road, Kilburn, N.W.* 262 1 0
 W. Chappell 465 0 0
 R. & A. Hyde 428 10 0
 P. T. Clitchen & Co. 398 10 0
Bow and Bromley, Monthwell-road (Painting Interior).
 Parrott & Ison £809 0 0
 Vigor & Co. £495 10 0
 H. Bouneau 612 15 6
 J. Sheffield, High-street, Wollaston Bros. 598 10 0
 218, East G. Barker 575 0 0
 India-road, J. F. Holliday 554 8 0
 Poplar-road, Barrett & Power 500 0 0
 E.* 449 0 0

S. Hackney, Morning-lane School and Hackney Divisional Offices (Painting Interior of School and Cleaning Interior of Divisional Offices and Special School).
 H. Runham Brown £577 0 0
 R. Woolaston & Co. £435 0 0
 Vigor & Co. 520 10 0
 W. Silk & Son, 13, High-street, Hounston, E.C.* 128 10 0
 W. Shurrup 450 0 0
 Sons, Ltd. 450 0 0
E. St. Pancras, Nelly-street (Painting Exterior).
 G. Foxley £225 0 0
 W. Chappell, 243, Elgin-avenue, Maida Vale, W.* £155 0 0
 Patman & Potheringham, Ltd. 202 16 0
 Marchant & Hirst 165 0 0

Battersea, Pough-road (Painting Exterior).
 J. & M. Patrick £230 0 0
 J. Garrett & Son £132 0 0
 E. Flood 205 0 0
 C. J. Jerrard 205 0 0
 R. E. Williams & Son 196 0 0
 Sellhurst-road, South Norwood, S.E.* 130 0 0
 R. A. Jewell 193 0 0
 E. B. Tucker 175 0 0

Woolwich, Plumstead-road (Painting Interior).
 Ennis Bros. £337 0 0
 E. Proctor & Son 297 0 0
 H. Groves, Stockwell-street, Greenwich, S.E.* 232 9 0
 W. Banks & Sons 236 10 0
 W. J. Howie 236 0 0
 Greenwich, S.E.* 232 9 0
Central Finsbury, Risinghill-street (Cleaning Interior).
 P. W. Harris £315 0 0
 G. S. Williams & Patman & Potheringham, Ltd. 296 6 0
 street, Thornhill-road, N. £242 0 0
 E. Bull 277 11 0
 A. Porter 259 0 0

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Designs for Laying-out Open Space in Centre of Town	Borough of Welshpool	5s. 5s.	July 15
*Designs for New School in Poulton-road	Wallasey U.D.C.	Not stated	Sept. 30

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Outside Painting, Upton Asylum, Chester	Committee of Visitors	H. Beswick, County Architect, Newgate-street, Chester	July 16
Painting, etc., Schools	Mass-side Education Committee	A. P. Maclure, Clerk, 36, Brazenose-street, Manchester	July 17
Schoolroom		A. L. Thomas, Architect, Pontypridd	July 18
Alterations, etc., Baptist Ch., Tonteg, Llantwit-Vardre		do.	do.
350 Steel Tramway Poles	Manchester Tramways Committee	J. M. M'Elroy, Tramways Department, 55, Piccadilly, Manchester	do.
Twenty Miles of Hard-drawn Copper Trolley Wire	do.	do.	do.
6,000 yds. of 2-in. Steam Tube, etc.	do.	do.	do.
Thirty-six Working-class Dwellings, Sallinoggin	Kingstown U.D.C.	M. A. Manning, Town Clerk, Town Hall, Kingstown, Ireland	do.
Fourteen do.	do.	do.	do.
Works, Highroad Pass-road	Hallifax Corporation	J. Lord, Borough Engineer, Town Hall, Halifax	do.
Police Station at Darfield, near Barnsley	West Riding County Council	J. Vickers Edwards, County Architect, Wakefield	do.
Alterations to Gelliger Boys' School, Pengam	Lincoln Corporation	S. Clegg, City Elec., etc., Engineer, Brayford Side North, Lincoln	do.
Traction Switchboard	do.	do.	do.
Tramway Feeder Tables	Croydon Guardians	E. West, 23, Coombe-road, Croydon	do.
Boiler at Infirmary, Mayday-road, Thornton Heath	Madras Railway Company	W. H. Cole, 61, New Broad-street, London, E.C.	do.
Stores	Settle R.D.C.	T. A. Foxcroft, Engineer, Town Hall, Settle	do.
Keaden Water Supply Works	Glismorgan County Council	M. M. Frankli, Ck., County Council Offices, Westgate-st., Cardiff	do.
Infants' School at Gendros, near Swansea	do.	F. E. P. Edwards, City Archt., Whitaker-bldgs., Brewery-st., Bradford	do.
Laundry at the Gelliger Boys' School, Pengam	Bradford Corporation	T. Morrison, Sec., Amens-street-Terminus, Dublin	do.
Alterations to Workshops, Thornbury Car Depot	G.N. Ry. Co. (Ireland)	do.	do.
Wheel Lathe	do.	do.	do.
Milling Machine	do.	do.	do.
Two Drilling Machines	do.	do.	do.
Sawing Machine	do.	do.	do.
Footpath	do.	do.	do.
Painting and Repairing Corporation Property	Altofts U.D.C.	District Council Offices, Altofts	do.
Laying-out Cemetery, Llandilo, Tal-y-bont	Stratford-on-avon Corporation	Roden Dixon, Borough Surveyor, Municipal Offices, Stratford	do.
500 tons Cast-Iron Water Pipes	Burial Board	Mr. White, Caecerrig, Pontardulais	do.
Alterations, etc., Caretaker's House at Sewage Works	Workington Corporation	W. L. Eaglesfield, Borough and Waterworks Engineer, Workington	do.
Brick Boundary Wall, Snydale-road	Normanton U.D.C.	At Offices of Council	do.
Machine Tools at Power Station	Preston Corporation	W. H. Tittensor, Eng., Tram. Power Sta., Holmrook-rd., Preston	do.
Extension, etc., of Bryncoch Schools, near Neath	Devonport Borough Council	J. Cook Rees, Architect, Neath	do.
Painting, etc., at Mutton Cove, etc., Piers	Stretford U.D.C.	J. F. Burns, Borough Surveyor, Municipal Offices, Rochdale	do.
Extension of Engine Room	do.	C. C. Atchison, Engineer, Electricity Works, Rochdale	do.
Making-up Street Passages	Wigan Corporation	E. Worrall, Surveyor, Council Offices, Old Trafford	July 19
Footbridges, Box, Minety and Churston	G.W. Ry.	Engineer, Paddington Station, London	do.
Fit Wood for Colliery Use	do.	G. K. Mills, Sec., Paddington, London	do.
Refreshment Rooms and Office, Carmarthen	do.	Engineer, Neath Station	do.
Hand Reversible Air Battery Booster, etc.	Wigan Corporation	J. Slevin, Borough Electrical & T'way Engr., Bradford-pl., Wigan	do.
Compound-wound Double Field Balancer	do.	do.	do.
Cables	do.	do.	do.
Artesian-bored Tube Well, Claphill, Beds.	Amphill U.D.C.	A. T. Tretwey, Clerk, U.D.C. Offices, Amphill	do.
Public Convenience, Park Row, Birtel	Bristol Sanitary Committee	T. H. Yabbicom, City Engineer, 63, Queen-square, Bristol	do.
Danger-posts and Symbols for Roads	Glamorgan County Council	T. Mansel Franklin, County Council Offices, Westgate-st., Cardiff	do.
500 yds. of Water Main, Heads Nook	Carlisle R.D.C.	Inspector, 7, Victoria-place, Carlisle	do.
Twelve Dwelling-houses in Margery-street, Carlisle	do.	Johnstone Bros., Architects and Surveyors, 39, Lower-st., Carlisle	do.
Eighteen Closet Pans and Fittings, Sligo	Committee of Dist. Lunatic Asylum	At the Asylum	do.
Gas Connections, etc., Cwm School	Swansea School Board	School Board Offices, Dynevor-place, Swansea	do.
Lime, Tubes, and Fittings, etc.	Swansea School Board	W. Whatnough, Gas Manager, Heywood	do.
Jam Works in the Least Market, Huddersfield	Heywood Gas Committee	B. Stocks, Architect, St. Peter's-street, Huddersfield	do.
Chimney Stack at Gasworks, Sanchory	Shoreditch Borough Council	J. Rush Dixon, Borough Surveyor, Town Hall, Old-street, E.C.	do.
Painting Model Dwellings, etc.	Corporation of London	Engineer, Public Health Department, Guildhall, E.C.	do.
* Underground Convenience, Fleet-street	do.	do.	do.
Sewer Work	Leith Town Council	Borough Surveyor's Office, Charlotte-street, Leith	July 20
130 tons of Cast-Iron Sewer Pipes	do.	do.	do.
Piling and Extending Outfall Sewer at Seafeld	Metropollitan Asylums Board	J. R. Rhind, Architect, 67, Hope-street, Glasgow	do.
Wright Work Fittings, Woodside Library	do.	J. G. Munro, Town Clerk, City-chambers, Glasgow	do.
Thirty Railway Waggon	Metropollitan Asylums Board	Office of the Board, Embankment, E.C.	do.
Fire Alarms, Darent Asylum, Dartford	do.	do.	do.
Telephones, Eastern Hospital, Honerton, N.E.	Warrington Health Committee	Office of Borough Surveyor, Town Hall, Warrington	do.
Telephones, Western Hospital, Fulham, S.W.	do.	W. Clement Williams, Architect, 29, Southgate, Halifax	do.
Painting and Cleaning Hospital, Alkin-street	Consett Iron Co., Ltd.	E. O. Oliver, F.S.I., Company's Office, Consett	do.
Sprinkler Tower, Stanfield Mills, Triangle, nr. Halifax	do.	do.	do.
Reconstructing Seven Cottages, Albert-road, Consett	Glamorgan County Council	T. Mansel Franklin, County Council Offices, Westgate-st., Cardiff	do.
Cement Footpaths, etc., Allendale Cottages	do.	do.	do.
Improvement of Main Road at Brynm.	The Managers	W. H. Dashwood Cople, Architect, Church-street-chamb., Cardiff	do.
Widening Abernethy Bridge, Glyn-Neath	Cardiff Corporation	W. Hagar, Borough Engineer, Town Hall, Cardiff	do.
Alterations, etc., Dinas Powis National School	Manchester Guardians	V. B. Murgatroyd, Archt'd., 23, Strutt-street, Manchester	do.
600 yds. of Steel Fencing & Gates, Whitechurch Asyl.	Ashton-under-Lyme Guardians	J. Eaton, Sons, & Cantrell, Architects, Stamford-street, Ashton	do.
Pair of Cottage Homes, Swinton	Witham Drainage General Commis.	J. H. Johnson, Engineer, Witham Office, Boston	do.
Telephones at Hospitals and Nurses' Home	St. Albans Guardians	Master of Workhouse	do.
Removing 30,500 cubic yds. of Deposit, Steeping River	Portsmouth Corporation	G. T. Bassett, Architect, Aberystwyth	do.
Removing 19,000 yds. Deposit, Fodder Dyke Drain	Blackpool Highway Committee	Borough Engineer, Town Hall, Portsmouth	do.
Unclimbable Iron Fencing at Workhouse	Stockport Gas, etc., Committee	J. S. Brodie, Engr. & Surveyor, Town Hall, Blackpool	do.
Outbuildings, National School, Aberystwyth	Edinburgh & District Water Trustees	S. Meunier, Engineer, Stockport	do.
Cast-Iron Outlet & Inlet Pipes, Canoe Lake, Southsea	Leeds Corporation	W. A. Tait, C.E., 72a, George-street, Edinburgh	do.
5,000 Tons of Portland Cement	Mr. J. Y. Evans	T. Hewson, City Engineer, Municipal Buildings, Leeds	July 21
Cast-Iron Mains and Fittings	Feniton-le-Fyde U.D.C.	R. Dutton, Clerk, Titebarn-st., Poulton-le-Fyde, near Preston	do.
200 Tons of Cast-Iron Pipes, etc., Alnwickhill	St. Austell R.D.C.	G. H. Newton, Surveyor, Town Hall, Denton	do.
Sewers & Laying Kerbstones (for 3 1/2 years respectively)	Rhondda U.D.C.	T. H. Andrew, Engineer, 1, Travarick-villas, St. Austell	do.
Additions to 138, Butest., Treorcy, Rhondda Valley	London C.C.	Engineer-in-charge, Victoria-chambers, Pentre	do.
Cast-Iron Pipes	Denton U.D.C.	R. Dutton, Clerk, Titebarn-st., Poulton-le-Fyde, near Preston	do.
Road Works, Lawstreet and Ashworth-street	St. Austell R.D.C.	G. H. Newton, Surveyor, Town Hall, Denton	do.
1,046 yds. of Cast-Iron Water Pipes	Rhondda U.D.C.	T. H. Andrew, Engineer, 1, Travarick-villas, St. Austell	do.
Eighteen Portable Standposts with Water Meters	Dublin Corporation	Council's Chief Engineer, County Hall, Spring Gardens, S.W.	do.
* Painting, etc., Western Pumping Station, Fimlico	Richmond (Yorks) R.D.C.	H. Campbell, Town Clerk, City Hall, Dublin	July 22
Machinery Oils	Walthamstow U.D.C.	J. Hodgson, District Surveyor, North Cowton, Darlington	do.
Building a Bridge over Aske Beck	Co-operative Society	Engineer-in-charge, Lincoln's-inn-fields, W.C.	do.
Cables, Troughing, Boxes, etc.	Norfolk Education Committee	Office of Secretary, Railway-street, Aylesbury	do.
Painting Shop Fronts	Anti-Vibration Incan. Lighting Co.	A. J. Lacey, Architect, Upper King-street, Norwich	do.
Additional to Tretshall School	Birkenhead Corporation	39, Prudential-buildings, Leeds	July 23
Workshop, Offices, and House, Calverley	The Governors	C. Browne, Borough Engineer, Town Hall, Birkenhead	do.
Sixteen Tenement Dwellings, Getley-st. & Egerton-st.	do.	Rev. E. Foyle Randolph, Mendlesham Vicarage	do.
Alterations, Mendlesham Endowed School	do.	D. Shepherd, Clerk, 5, St. John-square, Cardiff	do.
* Painting, etc., Boys' School, Newport-road, Cardiff	do.	do.	do.
Wood and Iron Shelter, Intermediate School, Cardiff	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Two roads, 16 yds. wide & a back road, Thornton-rd.	Salford Corporation	Smith & Gotthardt, Surveyors, 15, Cheapside, Bradford	July 23
Wiring Pendleton Town Hall	Bedwelley U.D.C.	Borough Electrical Engineer, Frederick-road Works, Pendleton	do.
Widening Bridge over Sirhowy River	Swinton and Pendlebury U.D.C.	J. H. Lewis, Surveyor, Blackwood, Mon.	do.
Street Washing-cart (500 gallons)	do.	W. T. Postlethwaite, Clerk, Council Offices, Swinton	do.
Horse Sweeper	do.	do.	do.
Six Back Kitchens, etc., Railway-ter., Kenog-hill Stns.	Trustees, Westgate Congre. Chapel	Mason's Arms, Kenog Hill	do.
Heating Congregational Chapel, Cleckheaton	S. Stafford Water Works Co.	B. Roberts, Nutter-street, Cleckheaton	do.
Additions, Ashwood Pumping Station, Kingswinford	Wimbleton U.D.C.	H. A. Hill, Engineer, Paradise-street, Birmingham	do.
Extension of Refuse Destructor, Durrasford-road	Wildnes Education Committee	Engineer and Surveyor, Council Offices, Wimbleton	July 25
Repairs, Council and Non-Provided Schools	Surbiton U.D.C.	Education Department, Town Hall, Wildnes	do.
Making-up Ellerton and Tolworth Park-roads	do.	J. Bell, Clerk, Council Offices, Ewell-road, Surbiton	do.
Restoring and Renovating Jerusalem Chapel, Rhymney	Richmond (Surrey) Town Council	P. H. Vivian Jones, Architect, Hengoed	do.
Fire Brigade Station, Seaside-road, West Marina	Rowley Regis U.D.C.	F. Palmer, Borough Engineer, Town Hall, Hastings	do.
800 Yards Stoneware Pipe Sewer, etc.	Horseay Town Council	J. H. Brierley, Borough Surveyor, Town Hall, Richmond	do.
Roadmaking, Jackson-st. and Holloway-st., Glidhill	Guldford Education Committee	D. Wright, Council Offices, Lawrence-lane, Old-hill, Stalls	do.
Roadmaking and Sewer Works	do.	Borough Engineer, Southwood-lane, Higginet, N.	do.
Alterations, etc., to Infants' Department	do.	E. L. Lunn, Architect, 36, High-street, Guldford	July 26
Making-up Boys' Playground, Charlotteville Schools	Sowerby Bridge U.D.C.	do.	do.
Whitening and Colouring Walls and Ceilings	Wolverhampton Guardians	Surveyor's Office, Town's Buildings, Sowerby Bridge	do.
Roadworks, Boston-street	Aberdare Education Committee	F. Harrison, Clerk, Union Offices, St. Peter's-cl., Wolverhampton	do.
Lagging Steam and Hot-water Pipes at Workhouse	S. India Ry. Co.	J. Morris, Clerk, Town Hall, Aberdare	do.
Alterations, etc., to Infants' Department	Burton-on-Trent Corporation	H. W. Notman & Co., Gracechurch-street, London, E.C.	do.
Seventeen Locomotives and Tenders	Dover Town Council	G. T. Lyman, Borough Engineer, Town Hall, Burton-on-Trent	do.
Farm-buildings, Blakeley Lodge, Etwell	Willساد D.C.	Town Clerk, Castle Hill House, Dover	do.
Road Materials	do.	Engineer to the Council, Public Offices, Dyne-road, Kilburn, N.W.	do.
Wood Paving in Green-road, Kilburn	C.B. West Ham	do.	do.
Roadmng., etc., Wellington-st., Ch'berlayne Wood-rd.	do.	Borough Engineer, Town Hall, West Ham, E.	do.
Making-up Kingsland, Olive, Patrick, & Coronat-rds.	Bromley Borough Council	do.	do.
Uniforms	Hackney Guardians	Borough Engineer, Bromley, Kent	do.
Street Improvement Works	Barnet U.D.C.	E. J. Hammond, Architect, 21, Balmoral-road, Gillingham	July 27
Ten Cottages, Chatsworth-road, Gillingham, Kent	Edmonton Guardians	Clerks' Offices, Sidney-road, Homerton, N.E.	do.
Electric Fire Alarm Bells at Homerton	Gorton Education Committee	do.	do.
Supply of Broken Granite, Gravel, and Hoggin	Kent and Canterbury Hospital	T. E. Knightley, Architect, 106, Cannon-street, E.C.	do.
New Chapel at Edmonton Workhouse	Kingston-on-Hull Corporation	W. J. Jennings, Architect, 4, St. Margaret-street, Canterbury	July 28
Temporary School for 600, Hyde-road	Coors. of Tewkesbury Gram. School	City Treasurer, Town Hall, Hull	do.
Mortuary and Post-mortem room	Admiralty	Borough Surveyor, Tewkesbury	July 29
Erection of Law Courts at Town Hall	Exeter Corporation	Works Dept., Admiralty Office, 21, Northumberland-av., W.C.	do.
Science and Art Buildings, Church-street	Bolton-upon-Deane U.D.C.	T. Moulton, City Engineer, Southemway West, Exeter	July 30
New Coastguard Buildings at Blackington	Birkdale U.D.C.	Surveyor, Council Offices, Bolton-upon-Deane, Rotherham	Aug. 1
Car Depot, Heavitree-road (Substructure)	Chorlton Guardians	G. Brown, Architect, 1, Dover-road, Birkdale	Aug. 2
Street Works, Williams-street, Highgate, Bolton	Dorchester Burial Board	C. Clegg & Son, Architects, 104, King-street, Manchester	Aug. 3
Library, Well-road, Birkdale	H.M. Office of Works	F. T. Malby, Architect and Surveyor, Dorchester	do.
Extension of Infirm. Wards, Withington Workhouse	Admiralty	H.M. Office of Works, Storey's Gate, Westminster, S.W.	do.
Boundary Wall, Weymouth-road, Dorchester	Chippennyam U.D.C.	Works Depart., Admiralty Office, 21, Northumberland-avenue, W.C.	Aug. 5
New Post Office at Hanley	L.C.C.	W. J. Jennings, 4, St. Margaret-street, Canterbury	Aug. 9
New Coastguard Buildings at Jury's Gap, Sussex	Addleston Building Committee	A. E. Adams, Waterworks Engineer, Council Offices, Chippennyam	Aug. 10
Add. to Kent County Lunatic Asylum, Barming Heath	do.	Rev. J. Castigan, Parochial House	Aug. 15
Machinery for Waterworks	do.	County Hall, Spring Gardens, S.W.	Oct. 4
Church Bell Tower, Cloughjordan, Co. Tipperary	do.	A. Veness, Architect, Chiu House, Surrey-street, Strand	No date
Pumping Plant	do.	Walker & Walker, Architects, 2, Hill-street, Wisbech	do.
Repairs, Alterations, etc., St. Paul's Church	do.	Vicar Road, near Binckham	do.
2 Fairs Cottages, Kensington, Terrington Marsh	do.	Shannon, White, & Co., 88 and 88, Shankill-road, Belfast	do.
Decorations of Read Parish Church	do.	H. Phillips, Architect, Cottingham	do.
Three Terrace Houses	do.	Lingen Barker, Architect, 146, St. Owen's street, Hereford	do.
Villa, Bridlington	do.	Grooms & Betington, Architects, Palace-chbrs., King-st., Hereford	do.
Wearage House, St. Paul's, Foleshill	do.	J. Armitage & Bros., "Robin Hood" Quarries, near Wakefield	do.
Cycle and Motor Works	do.	Iam School, Ashbourne	do.
Alteration to Premises, 118, St. Owen-st., Hereford	do.	Vicar Road, near Binckham	do.
Slating of Seven Houses at Rothwell	do.	A. Hill, F.R.I.B.A., 23, George's-street, Cork	do.
Slating up & Relaying Floor, Ham School, Ashbourne	do.	The Steward at the Club	do.
Cold-Water Supply, Cork City Asylum	do.	A. Marshall, Architect, King-street, Nottingham	do.
Operating Theatre at North Infirm. Cork	do.	W. B. Hill, Architect, 81, Above Bar, Southampton	do.
Corroated Buildings (120 ft. by 25 ft.)	do.		
Alterations, etc., to Infirm. Wards at Workhouse	do.		
Rebuilding Nos. 43 and 45, Above Bar, Southampton	do.		

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	U.D.C. of Handsworth	33 guineas per week	July 19
*Borough Surveyor	Borough of Chesterfield	300. per annum	July 21
*Quantity Surveyor	New Windsor Borough Council	Not stated	Not stated
*Assistant Town Treasurer	Durban (Natal) Corporation	600.	Aug. 3

Those marked with an asterisk (*) are advertised in this Number. Competitions, iv. Contracts, iv. vi. viii. x. Public Appointments, xvi. xviii.

TENDERS.—Continued from page 79.

LONDON EDUCATION COMMITTEE continued.—			
Clapham, Kensington-st. (Painting Interior enlargement, Cleaning Interior old garion, and Painting Exterior oil buildings).			
Holliday & Green- Wood, Ltd. 2539	W. Johnson & Co., Ltd. £489	J. Garrett & Son ... 419	
E. Flood 673	J. Carmichael 408		
W. King & Son 585	E. Triggs, 92, The		
R. S. Ronald 530	Chase, Clapham*... 387		
E. P. Bulled & Co. 497			
Central Hackney, Tottenham-road (Cleaning Interior PT and JM).			
W. Hornett, 17, Houghton-st. 153	J. Grover & Son £227 0 0	C. Dearing & Son 243 0 0	
Straud, W.C.* £173 5 0	H. Bouneau... 318 5 0		
G. S. S. Williams 223 0 0	F. W. Harris ... 425 0 0		
Fulham, Townmead-road (Iron Buildings) (Cleaning Interior and Painting Exterior).			
E. B. Tucker, 82, Lavender-hill, S.W.* £ 65	W. Hammond 157	J. & M. Peacock 112	Lathey Bros. 180
R. S. Ronald 120	General Builders, Ltd. 145		
Fulham, William-street (Cleaning Interior and Painting Exterior, Infants and Pupil Teachers).			
W. Hammond £277 0	F. Childley & Co., H. E. & A. Hyde 236 11	59, Lyford-rd., S. Poldon 212 17	Harrow-rd., W.* £150 0
E. T. Clinchenden 207 0			
S.W. Bethnal Green, W.Mot-street (Painting Exterior).			
Parrot & Isom £398 0	J. Haydon & Sons £235 8	A. Heard & Co. 342 0	G. Willmott & Son £272 0
Stevens Bros. 296 10	The Triangle	W. Martin 265 0	Hackney, N.E.* 227 0
H. Ransham Brown 245 0			
Central Hackney, Wilton-road (Cleaning Interior).			
F. W. Harris £322 0	C. Willmott & Son £272 0	Barrett & Power 309 0	H. R. u n h a m
G. Barker 296 0	Brown, 107, McCormic & Son 283 0	D. o w n s - r o a d , H. Bouneau 276 10	Clapton, N.E. 209 0
J. Grover & Son 278 0			
N. Islington, Terbury-road (Painting Exterior).			
C. Dearing & Son £260 0	F. W. Harris £189 0	W. Martin 250 0	Marchant & Hirst, McCormic & Son 248 0
Stevens Bros. 248 0	136, Highgate- road, N.W. 177 0	J. Grover & Son 220 0	
Fulham, William-street School.			
(a) That Mr. F. G. Minter be allowed to withdraw his tender for carrying out improvements at the William-street School.			
(b) That the estimate, No. 4,217, of £4,939, submitted by the Finance Committee, be approved; that expenditure not exceeding that amount be sanctioned in respect of improvements at William-street School, Fulham; that, as soon as the amount of Education shall have approved the finished plans, the tender of Messrs. Leslie & Co., amounting to £4,704, be accepted.			
For Removal of Two Iron Buildings now standing on the Telford-road site, Clapham, and One Iron Building on the Enham-street site, Totting, and for Re-erecting the Three Buildings on the site in Foundation, Wandsworth:—			
T. Cruwys £1,775 0 0	Humphreys, Ltd. 1,771 0 0	R. Ties, Ltd. 1,832 0 0	A. Leathet 1,832 0 0
Mison 1,718 3 6	W. Harrow... 1,290 0 0	J. McManus ... 1,473 0 0	F. Smith & Co., Carpenter's- road, Strat- ford* 1,260 0 0
T. J. Hawkins & Co. 1,370 0 0			
For the Heating of the London County Council Popular Technical Institute, including Installation of the Experimental Plant in Connection with the Ordinary Heating Appliances, and the Installation of the Electric Light of the Institute:—			
Wenham & Waters £1,610	Strods & Co., 48, Simpson & Co. 1,180	Osnaburgh-street, N.W.* £1,043	
For the Installation of the Electric Light.			
Peacock & Jossop £950	Electrical & General Mosop & Co. 940	Engineering Co. ... £718	
J. H. Holmes & Co. 790	Alliance Electrical Co., 137, Regent-st., W.* 666		
Drake & Gorham 787			
Wenham & Waters 770			

LONDON.—For the erection of cottages, Totterdown-estate, for the London County Council:—

Table listing contractors and amounts for the erection of cottages at Totterdown-estate.

NEW ROMNEY (Kent).—For erecting casual working cells, infirmary, bathroom, and water-closets, etc., at the workhouse, for the Romney Marsh Guardians. Mr. Thurlow Finn, architect, Guildford:—

Table listing contractors and amounts for the erection of casual working cells at Romney Marsh.

PADIHAM (Lancs).—For extension of Unitarian School, Knight Hill, for the Building Committee of the Trustees of Unitarian Chapel, Editham. Mr. Arthur Dolven, surveyor, Whalley-road, Altham, Acerington:—

Table listing contractors and amounts for the extension of Unitarian School at Padiham.

PILLING (Lancs).—For erecting the Golden Ball Hotel, for Mr. E. G. S. Hornby. Mr. J. Parkinson, architect, 67, Church-street, Lancaster. Quantities by architect:—

Table listing contractors and amounts for the erection of the Golden Ball Hotel at Pilling.

PRESTON.—For paving, etc., Burrow-road, for the Corporation:—

Table listing contractors and amounts for paving Burrow-road at Preston.

RUSTINGTON.—For road-making and tar-paving works at Millfield Homes, Rustington, near Littlehampton, for the Metropolitan Asylum Board. Mr. W. T. Hatch, Engineer-in-chief:—

Table listing contractors and amounts for road-making at Rustington.

SHOREHAM.—For forming new footway in Lower-road, for the Urban District Council. Mr. A. W. Nye, Town Surveyor, Town Hall, Shoreham:—

Table listing contractors and amounts for forming a footway at Shoreham.

STAPLEFORD.—For making Lawrence-street and Albert-street, for the Rural District Council:—

Table listing contractors and amounts for road works at Stapleford.

STIFFORD (Essex).—For works for the collection and storage of rain-water at Children's Homes, for the Stepney Guardians. Mr. F. T. Bazgally, architect. Quantities by Mr. F. R. Smith, 13, Victoria-street, Westminster:—

Table listing contractors and amounts for rain-water works at Stifford.

THATHAM.—For building a police station, for the Standing Joint Committee of the County of Berks, according to the plans prepared by Mr. J. Morris, County Surveyor, Broadway-buildings, Reading:—

Table listing contractors and amounts for building a police station at Thatham.

WALTHAMSTOW.—For erecting Warwick-road School Buildings, etc., for the Education Committee. Mr. H. Prosser, Architect to the Committee, High-street, Walthamstow:—

Table listing contractors and amounts for school buildings at Walthamstow.

WATERLOO (Lancs).—For widening Brooke-road, for the Urban District Council. Mr. F. Spenceur Yates, Surveyor, Town Hall, Waterloo:—

Table listing contractors and amounts for widening Brooke-road at Waterloo.

WINGATE.—For new buildings for the Wingate Station Town Working Men's Club. Mr. E. T. Bailes, architect, Wood House, Wingate:—

Table listing contractors and amounts for new buildings at Wingate.

WORTHING.—For making-up Shakespeare-road, from Manor-road to Tarring-road, for the Town Council. Mr. Frank Roberts, A.M.Inst.C.E., Borough Engineer and Surveyor, Worthing:—

Table listing contractors and amounts for Shakespeare-road at Worthing.

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ILLUSTRATIONS.

Scriptured Panels, Crewe Municipal Buildings	Mr. F. E. E. Schenck, Sculptor.
Exterior, New Bartholomew's Hospital	Mr. E. B. F'Anson, F.R.I.B.A., Architect.
Selected Design for Royal Grammar School, Newcastle:—	
Perspective View and Plans }	Messrs. Russell & Cooper, Architects.
Elevations and Sections }	

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"Civics" from an Architectural Point of View.



HE address by Professor Geddes last Monday on the subject which he has defined by a new word in our language—"Civics," may mark an important

step in the progress of ideas as to the formation of both the political and the material city. At all events it is an interesting event to find a man of literary and mental culture like Professor Geddes occupying himself in emphasising publicly the idea that city government, polity, and planning, should not be allowed to develop accidentally, but should represent a reasoned and thought-out system.

The history of great cities, both socially and materially, is one of the most interesting of studies, for which, as Professor Geddes remarked, sources of information exist, in the statistical literature of the cities themselves, which have not been fully drawn upon. Their institutions, like English liberty, have "broadened slowly down from precedent to precedent," and if London could now be planned *de novo*, both in its municipal institutions and in its architectural planning, it would be a very different city from the one which now exists and which we are striving to make the best of, in the face of obstacles left in our way by old-fashioned institutions and old-fashioned street planning and building. Yet these

anomalies, both political and material, have a great and picturesque historical interest; through them we see how the forms of the city life of the present day slowly struggled into being; and in some senses it would be impossible to give to a city planned and politised anew on a given scheme, the same interest which is inherent in the remains of old streets, with their old names derived from trade, family possession, or local circumstance, and their old and often cumbrous institutions, which remain as witnesses of a polity suited to other circumstances, and now picturesquely out of date.

While fully appreciating the importance of the political point of view, it is with the outward and visible city that we are concerned. And one is obliged to admit that a city systematically planned as a new erection, however grandiose, must fail of much of the beauty of circumstance and association which cluster around the ancient city of irregular growth. The Americans have emphasised this in New York and others of their cities by merely calling the streets by number names; thus depriving themselves of that interest of association which the French give by associating new streets with names of eminent men or of remarkable events; a system which we have fortunately to some extent adopted in London of late. A city laid out on gridiron lines and numbered is an unhappy and prosaic affair, quite unworthy of an educated generation. Any opportunity which may occur of founding and planning a modern city from the beginning—and it really seems as if we

may have such happening nowadays—should be regarded as an opportunity for creating a work of art on a great scale, which may appeal to us by its architectural beauty, though it can have none of the picturesque interest belonging to an old city. You cannot make the picturesque; it grows. Hence, as Professor Baldwin Brown urged in his lecture on old Edinburgh, reported on another page, in making improvements in a new city, the most reverent care should be taken of the relics of its past history, so long as their retention does not interfere with sanitary conditions or very materially with public convenience. Sanitary considerations must predominate over historical associations—that is, a mere matter of common sense; but ancient relics should not be swept away merely on the plea of public convenience, unless the inconvenience is a very serious one. There is too much an inclination, among the City Fathers of modern days, to regard every possibility of a shortened street route, for instance, as a reason for pulling down whatever stands in its way, whether new or old; whereas there are often cases in which the increased convenience of transit is hardly worth considering in comparison with the destruction that must be perpetrated to obtain it.

In planning a new city we want not a Utopia but a Eu-topia, as Professor Geddes characteristically put it, contrasting the original grammatical meaning of the word in its Greek form with the acquired meaning which More's fanciful treatise has given to its Latin form

Planners of new cities have a considerable temptation to be Utopian in the More-ish sense—to aim at an ideal perfection which will hardly work, and may defeat its own ends. At the same time, the planners of a new city have a great deal in their power. They can make, *ab initio*, those arrangements for convenient conduits for water and gas mains, electrical power, and sewerage, which we feel the want of so much now, but which it is almost impossible to realise in a city already built. The desirability of arranging things with regard to the future and not merely for present requirements, is almost a new idea; or, if it was at all acted upon a generation or two back, a lack of imagination and of scientific prophecy prevented the city improvers of that day from realising what would be the probable requirements of half a century or so later. But the Utopian is a more dangerous person to an old city than to a new one, or would be if there were any chance of his having his own way. He is the kind of man who would block up all our streets with bridges and crossings, or send us all into tunnels, to get rid of the rather imaginary danger and inconvenience of crossing a street on a level. He would ruin all our city architecture if he had a chance, but fortunately his proposals are usually so preposterous as to defeat themselves.

What should be aimed at in a modern city is fine and effective architectural alignment to begin with, as a foundation for everything else, while avoiding a tame and formal symmetry; wide roadways and foot pavements (just compare the width of pavements in the modern streets in Paris with our cramped strips of flagging); the provision of trees in streets (again compare Paris); and the securing of gardens and open spaces for ever defended from being built on. There is another source of beauty in cities mostly forgotten, but of great charm, viz., the introduction of running streams through cities, or their protection where they exist. The site of London was once intersected by several running brooks, one of them a large and important one. Only think what a charming feature we should have secured in London had these brooks been revivified with built-up retaining walls and maintained as running water, instead of being allowed to be choked and built out of existence. For these it is now too late; they are dead and buried, though the Fleet is said still to run an invisible course underground. What else we can do with old cities, and London especially, is to preserve religiously all the open spaces there are; to make our new streets of ample width (we are still far too narrow and timid in our ideas in this respect); to make every provision for planting trees in them; and to insist on a certain standard of architectural treatment of new streets. But this last is a subject in itself. One or two feeble and half-hearted municipal attempts have been made, resulting in utter failure through want of a decisive plan and a determined intent. It is to be hoped that a more energetic endeavour may yet be made to remove our new streets above mediocrity and commonplace.

LIGHT AND WATER.

THE two words combined stand for a whole crowd of associations of natural and pictorial beauty. Not only is water almost the only surface in natural landscape which brilliantly reflects light, but it owes most of its varying effects to the manner in which light strikes it and is reflected from it, according to the condition of its surface. When water is more or less roughened or rippled it is the appearance of its own surface under reflected and flashing lights which makes the painter's problem. When it is still, the problem takes another form, for the water becomes a mirror, absorbing rather than reflecting light, but on the other hand reflecting the objects on the surrounding landscape; a natural incident the charm of which seems never to tire. This charm of reflecting water is a double one; partly pictorial, arising from the reduplication of colour and hue which it shows, and the softened effect which, even in perfectly still water, gives a new texture to the reflected colours; partly that of mental association, since, knowing as we do that complete or nearly complete reflection can only occur in calm water, we unconsciously associate the incident with ideas of calm and repose:

"The swan on still St. Mary's Lake
Floats double, swan and shadow":

a couplet which gives a sense of repose to the whole passage, in spite of the poet's unscientific use of the word "shadow" for what is not a shadow. There is no effect more seductive to the mediocre artist than this of reflection in water; and it seems so delightfully easy too! Yet this is rather a delusion, for while the reflected light from the surface is much simpler in still than in rippled water, the problem of reflected objects is a complicated one, introducing questions of perspective effect which are often overlooked. It seems, to the superficial amateur, such an easy thing, when regarding water as a mirror, to repeat below its plane, more or less distinctly, what is visible above its plane. Yet in fact this reduplication can never occur except with objects close to the water's edge, and even then only if they present a flat vertical plane at right angles to that of the water. In the reflection of a wall with projecting coping, for instance, it will be the shadowed soffit of the projection that will be seen in the water, which, if the spectator's eye is above the top of the real wall, will be invisible to him. So the reflection of a plant overhanging at the water's edge will show the shadowed side of the leaves, not the sunlit side which the spectator sees in the real object. There is indeed the theoretical case of the eye being on the level of the water, when image and reflection would be identical; but this is too merely theoretical for consideration.

It is the fact that the eye is always more or less above the level of the watery mirror, which produces such often unexpected discrepancies between the appearance of objects in reeding planes in the actual landscape and their reflection in the water. The reflection, if we could reproduce it as a solid entity, is really the precise inversion of the actual

objects, but we see them at a different angle. Consequently foreground objects in the reflection intercept those in their rear in a manner in which they do not intercept them to the eye in their material positions. It is a question of perspective effect. We remember a curious and unforgettable object-lesson in this respect many years ago, when walking in a country lane in twilight, approaching an open space with a pond in the centre. On the further side of the pond passed a team of horses, totally invisible in the fading light in consequence of a dark mass of hedge beyond them. But in the reflection in the pond the whole team was clearly silhouetted against the reflected sky, the hedge being too far back to come into the line of reflection. It was a most curious and unexpected effect, quite puzzling at the moment.

Sir Montagu Pollock has published an interesting and useful book* in which he has summed up the results of much observation both on the perspective of reflections and on the effects of light on water, and in which he explains by very clear and instructive diagrams the reasons for the discrepancy between the material objects and the reflections as seen in calm water. The subject touches both on the scientific and the artistic side of art-study. Experienced artists perhaps hardly need such demonstration of facts which they must often have noticed in painting or sketching from nature; yet some painters who are masters of the representation of colour and aerial effect in landscape are not always very strong in the perception of perspective, and to beginners in landscape sketching it must be most useful to have the scientific reason for these perspective effects of reflection so clearly demonstrated to them by means of diagrams—sections so to speak, of the landscape, the reflection, and the water-plane. Though good many various results are illustrated in detail, the whole principle of the matter is really summed up in his Fig. 4, showing "The difference between the reflection and the direct view depends upon the height of the eye above the water." In this diagram, which we reproduce, the spectator is supposed to be placed on the summit of a hill overlooking a lake with a house and trees and a hill behind them on the other side of it; but he sees nothing reflected by the top of the opposite hill. To explain this the author supposes him to be situated at a position at an equal depth below the water level, vertically under his original position; and it becomes obvious at once that from that position he could not see the top of the opposite (actual) hill, the projection of low land below hiding from him both the houses and trees and the base of the hill. What is true of the inverted standpoint and actual image is true of the actual standpoint and the inverted image. If he took his stand on the low ground nearer the water-level he would see a reflection of a considerable portion of the house and of nearly three-fourths of

* "Light and Water, a study of reflexion and reflection in river, lake, and sea." By Sir Montagu Pollock. London: Geo. Bell and Sons, 1903.
+ The author writes "reflexion," and therefore quoting him we give "spelling," though it is not one we have usually adopted. Philologically, it may be defended.

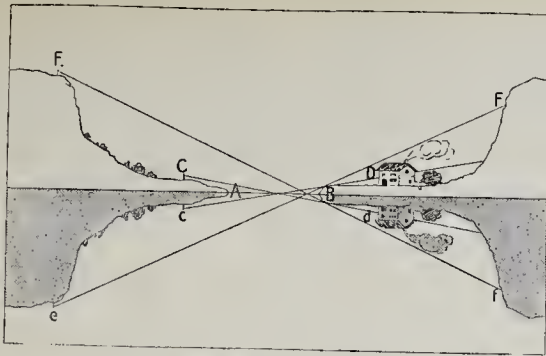


Diagram Showing Effect of Elevated Standpoint upon Reflections.

opposite hill. It seems so simple as to be self-evident, when drawn out in this way as a section; yet it represents a practical fact often overlooked. A good many other diagrams illustrate various applications of the rule under various circumstances, and these may make it plainer to some readers; but the whole theory is really summed up in this diagram, and any one who has properly grasped the fact as illustrated there can apply it in any other case.

While recognising the clearness of the author's reasoning and demonstration on this point, we confess that we cannot follow him in his note about the rainbow at the end of the chapter. To put the question "Can a rainbow be reflected?"

has perhaps not occurred to everyone; but it is no doubt a curious point, when we consider that a rainbow has no objective existence, and that, as the author puts it, no two men see the same rainbow. But then we have to remember that a reflection has no existence either; and that, in a somewhat similar sense, no two men see the same reflection, since the reflection depends upon the position of the spectator. We have read his note and examined his diagram carefully, but it carries no conviction to our mind. The author seems to suggest that if the spectator on a position some distance above the water level looks down to the water for a reflection of his rainbow, he will see (if he sees any reflection) not the reflection of that rainbow but of another, which is invisible except by reflection. It is possible that in very clear water he might see an apparent rainbow at another angle formed against the reflected cloud in the water, but we are of opinion that he will also see in the water the reflection, in the ordinary sense, of the rainbow that he sees in the air, if it is sufficiently strongly brought out against a dark cloud also (of course) reflected. The cloud, it is true, is a material entity, the rainbow is not; but we only know that by reasoning; to the eye it is an entity, and reflection itself is only an optical effect. It is seldom that there is an opportunity of testing the point by observation; but imagine the case of a brilliant rainbow strongly believed against a dark cloud, and above calm water; does the author mean to assert that the cloud will be reflected and rainbow light will not be? We should certainly be very much surprised to find that it was so. Turner, we think, has

Painted a segmental rainbow with a portion of it reflected at the reverse angle in water; we seem to remember such a point in one of his works; and though Turner cared little about verisimilitude in the details of a scene, he studied general facts of nature carefully. The author admits that he has never had an opportunity of seeing any such break as he imagines there must be between the real (if one may so speak) and the reflected rainbow; on the only occasion when he remembers seeing the reflection of a rainbow in water, "its extremities were hidden by near objects, so that he had no opportunity of observing the break." We should very much doubt if he ever will have one.

The chapter on the reflections in rippled water is very well done, and gives in diagrams the optical reasons for various effects of light on rippled water which are often represented in painting with more or less truth, though not always with evidence of distinct reasoning as to the causes of these effects. There are two interesting points to which the author draws attention. One is, that the reflection from the sun is more vertical in a comparatively light wind, where the ripples follow each other in pretty regular lines, and more spread out in a stronger wind, where the waves are more broken up into different angles and there are more facets to throw off side lights. Accordingly, where the pathway of the moon on the water widens out towards the horizon, this is an indication that out at some distance there is rougher water. Another point mentioned by the author in regard to painting reflections in rippled water is, that those of distant objects tend to lengthen out, or lengthen down, vertically, and are therefore best represented by vertical strokes of the brush, whilst nearer at hand these reflection marks resolve themselves into separate horizontal streaks. He does not in that sentence point out the reason of this, though it is to be inferred from remarks on other pages; but the reason undoubtedly is that in the distance we see only the top and front of the ripples, which present the same reflection, while in the foreground we see over the crests on to the other side, which reflects at a different angle. We noticed an instance of this the other day, in walking by a piece of water ruffled by a fresh breeze, in which there were various posts placed at intervals. As long as these posts were

at a distance, they presented no reflection, for we could only see the top and near side of the ripples, which reflected sky light. As we approached each post, it developed a strong though broken-up reflection, because we could then see over on to the further side of the ripples, which reflected the dark colour of the posts. That seems a very suggestive object-lesson as to the effect of distance in modifying reflections in rough water.

The chapter on colour in rippled water is one that we think painters will find interesting, and many of the remarks in it we can confirm from our own observation. On the subject of sea-colour, which is especially interesting and complicated, a good many suggestions are made in explanation of the varied and sometimes quite unexpected effects of colour in rough seas. One of the practical conclusions from the study of the subject is that rough water is better represented by detached spots of colour than by any pervading colour. Owing to the varied faces presented to the light, it is possible, the author remarks, to make out three or even four distinct colours on each little wave in an ordinary ripple. This however, of course, can only refer to foreground waves; in the middle distance the points of colour would blend into one pervading tone, and could only be so represented in painting.

We recommend the book to the attention of painters; whether they agree or not with all the views expressed, they will find it interesting and suggestive; and to all lovers of nature, whether painters or not, the subject is one full of fascination.

NOTES.

The Hampstead Heath Extension Council are appealing to the public for help to save the beauty of Hampstead Heath from being destroyed by the building which will probably follow the formation of the Tube railway terminal station on the Heath, unless measures can be taken to secure the land for the public. With this view the Hampstead Heath Extension Council (as we have before mentioned) are endeavouring to raise money to purchase from the Eton College Trustees Wylde's Farm and the meadows lying on the north-west boundary of the Heath, and adjacent to the new station. Plans have actually been made for laying out this land, about 80 acres in extent, for streets and houses, making a small town by the terminus, which would completely spoil the view from this portion of the Heath. The Heath Extension Council have the option of purchase till September 1, and unless the land can be acquired before that date it will be sold for building land. About 6,000l. more is still required to make up the purchase-money. It is to be hoped that this will be done, or the opportunity will be gone for ever. Subscriptions can be sent to Mrs. Barnett, Warden's Lodge, Toynbee Hall, Whitechapel; to the London and South-Western Bank, 28, High-street, Hampstead; or to Lloyd's Bank, Rosslyn Hill, Hampstead. Apart from larger subscriptions, if every one who goes on the Heath would send a

shilling to the fund, a good deal would be done.

Highways and the Heat. THE continued dry weather is playing havoc with many highways, either because they are not properly managed or because they are too narrow for the traffic upon them. As regards the first point it is evident, as can be demonstrated to anyone who will inspect a few highways, that steam-rolling is something of a snare. For there is now, with an increased use of steam-rollers, a distinct tendency to break up the stones less, and also to put round stones down with angular stones. After a steam-roller has been over a road, however improper the material may be, it has for a time an appearance of smoothness. But when continued dry weather comes the round stones or those which are too large begin to get loose, and the entire surface gradually breaks up. When stones were carefully broken and worked in by traffic in winter the initial process was amounged at first to the wayfarer, but the result was a road which was stronger in dry weather than a road with improper material only partially bound together by a steam-roller. In the southern counties, notably in Hert and Bucks, miles of roads are now in a very bad state from the above causes.

"Owners" and Street Improvements. IN the case of Mayor, etc., of Hackney v. Lea Conservancy Board (*Builder*, p. 74) the Court of Appeal had to determine the meaning of the word "owner" in section 250 of the Metropolis Management Act, 1855. This question has frequently come before the courts, and the decisions have been noted by us from time to time. The Conservators of the River Lea were called upon to bear their proportion of the expenses of making up a new street in respect of a strip of land which was used by them solely as a retaining bank on the Hackney Cut, but which was 26 ft. wide and capable of other use, and the question was whether they were "the persons for the time being receiving the rack rent of the premises or who would so receive the same if such premises were let at a rack rent" within the meaning of the Act. The Court below had held that the premises were held for purposes inconsistent with the land being rack-rented as between landlord and tenant. The statutes under which the Conservancy held the land contained no power to let, but they did contain a power of sale. The Court of Appeal held that they held the land beneficially, and that it was not *extra commercium*, and that even if they had no power actually to let the land themselves it was nevertheless capable of being let at a rack rent, and the Conservators were therefore liable as owners to contribute to the paving expenses.

Drains or Sewers. IN the case of Harris v. Seurfield (*Builder*, p. 74) the old question of drain or sewer was again litigated. The appellants were the owners of eighteen houses which were built in blocks of six to seven houses and were back to back. The drainage for slop water was by separate channels cut in the pavement of the court between the houses at right angles to

each house into a side channel, and from the side channel into gullies, and thence to the main sewer. The owners were called upon to abate a nuisance arising from these cross and side channels under the Public Health Act, 1875, the contention being that as the premises were in the same curtilage these were separate drains. The magistrates had adopted this view, but the Divisional Court held they were sewers, since houses separately occupied could not be brought within the meaning of the word "curtilage," even though there was a common access and to a certain extent common accommodation. The Lord Chief Justice in almost pathetic terms alluded to the recurring difficulty of deciding these cases and the apparent futility of pointing out the necessity for fresh legislation.

The Welsh Power Scheme.

It is interesting to note that substantial progress has been made with the extensive system of electrical power distribution inaugurated in South Wales. The district assigned to the company comprises over 1,000 square miles, and uses something like 500,000 horse-power, chiefly provided at the present time by steam and gas engines. As the electricity company is already able to supply current for power purposes at 3d. per Board of Trade unit, it is probable that users will find considerable economy to result from the adoption of electricity. The company has so far established three generating stations, one at Pontypridd with a capacity of 6,000 h.p., and others at Cwmbran of 1,320 h.p. and Bridgend of 750 h.p., while a fourth is in course of construction at Neath. One excellent result of the scheme is that the Bridgend Urban District Council, who had proposed very heavy expenditure for the erection and equipment of a generating station, decided to purchase the current required, and were able to show a profit on the first year's working of their electricity department—a result that is somewhat unusual in connexion with municipal enterprises of the kind. We should now like to hear of some electric power schemes involving the utilisation of water power for the generation of current, provided they do not involve the destruction of any picturesque waterfall.

Folkestone Harbour Extension.

On Tuesday last week, when laying the final stone of the new pier and harbour works at Folkestone, M. Cambon appropriately observed that the ceremony had a special significance and marked the *rapprochement* realised between the peoples of England and France. The works, which were commenced in 1896, include the reconstruction of the pier with six new landing-stages, the rebuilding of two railway stations, and the erection of an overhead promenade. The old timber pier is replaced by a granite-faced concrete structure, with a width of 75 ft., which is continued 900 ft. beyond the end of the old pier—300 ft. in a straight line and 600 ft. at an angle of 36 deg. therefrom, so as to form shelter for vessels lying on the eastern side of the pier. The new landing-stages provide adequate accommodation for steamships at high or low tide, and two berths

situated on the western side of the pier will afford protection during the prevalence of east winds. The railway platform now runs the full length of the pier, and the new promenade forms the roof of the station buildings. On shore, the old harbour station is in course of replacement by a new structure, and the whole of the works constitutes a most important improvement which we are sure will be appreciated by travellers on both sides of the Channel.

Magnetic Alloys.

IN a paper read to the Dutch Physical Society last June, Dr. F. Heusler described how he discovered, owing to one of his tools having been accidentally magnetised, that a particular alloy of manganese and tin was strongly magnetic. He has since made a careful research on the magnetic properties of alloys of manganese, and has made one or two further discoveries which may have several commercial applications. He has noted that given alloys become non-magnetic at definite temperatures, and that this temperature, when the manganese is alloyed with lead, is only 140 deg. Fahrenheit. This can obviously be utilised for temperature-indicating devices, and, if it is found that the alloys do not lose their magnetic properties with time, it can also be used in connexion with fire alarm devices. A manganese lead magnet, for example, would lose its magnetic properties at 140 deg. Fahrenheit; its keeper would therefore drop at this temperature, and it could easily be arranged that it should complete an electric-bell circuit, and so give the alarm. Theoretically, also, it seems to us that this discovery of Dr. Heusler's solves the problem of converting heat directly into work. By alternately heating and cooling a magnet made of one of these alloys, the keeper may be kept oscillating by the magnetic attraction continually overcoming its weight, and thus work could be obtained. A generator for electric currents could also be made on this principle. It was found that an alloy of manganese, aluminium and copper rivalled cast iron in its magnetic properties, and although the cost of this alloy makes its commercial application at present out of the question, yet it is highly probable, seeing the important results obtained in this brief research, that further discoveries in the immediate future will make these alloys useful in dynamo construction. From a theoretical point of view many interesting problems have arisen. A new magnetic theory seems to be required to explain why, for example, the addition of aluminium to practically non-magnetic alloy should convert it into a powerful magnet.

The Volcanic Origin of Oil.

AS OBSERVED by geologists at various times, not only are gaseous, liquid, and solid hydrocarbons among the more important products of solfataric volcanic emanations, but also acid vapours, sulphuretted hydrogen, gypsum, and calcareous or siliceous waters. That such volcanic phenomena represent the normal orderly process of petroleum production appears to be a clearly established

geological fact, for reasons which are stated by Mr. Eugene Coste in a paper recently read before the Franklin Institute. It is interesting to note that, as pointed out by the author, the oil, sulphur, salt, natural gas and hydrogen-sulphide products of the Texas Coastal Plain are not indigenous to the strata in which they are found, but are resultant products which have ascended, under volcanic pressure, at points along lines of structural weakness, and have been disseminated through thousands of feet of the shales, sands, and littoral sediments of the same region. After an exhaustive discussion of the subject, Mr. Coste arrives at the important conclusion that as oil and gas have only been supplied along lines of structural weakness, or along fractured zones of the crust of the earth, new oil and gas fields are to be looked for only along such belts or zones. Existing oil and gas fields serve to indicate the position of numerous oil belts, and the author suggests that, so far as practical results are concerned, the important point is to accurately trace the fissured areas on reliable maps, and to drill in the localities thus indicated.

Museum at Famagusta, Cyprus.
A LITTLE museum of the most modest pretensions has been recently constituted in Famagusta, Cyprus, for the purpose of housing the valuable fragments of sculpture which for more than twenty-five years have littered the Zaptieh harrackard, in the middle of the ruined city. It is to be hoped this is the beginning of good things, as far as Cypriote antiquities are concerned. The collection of fragments now rescued from a miserable condition has been to a great extent illustrated in the great work on "L'Art gothique et de la Renaissance en byzpe," published by M. Enlart, at the inst of the French Government, in 1899. It would that we could record the institution of similar "provincial museums" in other parts of the island, for preserving the interesting remains of mediæval art still surviving in private possession, abandoned to the tender mercies of government officials.

The Star Chamber.
ADVERTING to the recent decease of Sir Reginald Palgrave, who until his retirement in 1900 had been during many years Clerk to the House of Commons, we may mention that amongst his investigations in the field of historical ætymology was an inquiry into the exact position of the Star Chamber. Sir Reginald Palgrave succeeded in ascertaining, after much research, that the drawing-room of his own residence—room which has since been given up to the leader of the House of Commons—stands almost precisely over the spot where the Star Chamber, having escaped from a fire in 1834, was destroyed for the hiding of the north wing of that part of the precincts of the new Houses of Parliament. On July 8 were sold at Messrs. Foster's rooms in King-street, ten guineas, eighteen pieces of stained glass, bearing heraldical devices and portraits of Kings of England, which had been removed from the Star Chamber many years ago.

Chartley Castle Estate, Staffordshire.
THIS estate, which extends over some 8,000 acres, lying between Stafford and Uttoxeter, will shortly be offered for sale at auction. Of the ninety-eight lots the principal lot includes the Manor Farm and its early Elizabethan manorial house, Chartley Park, famed for its indigenous herd of wild white cattle—descended from the primeval herds of Needwood Forest—Chartley Hall, a seat of the Shirleys, Earls Ferrers, and the ruins of Chartley Castle. The latter consists of two ivy-covered round towers encompassed with yew trees, being the remains of the castle built by Randolph de Blundeville, fourth Earl of Chester, in 1229, after his return from Palestine. His sister brought the county estates in marriage to William de Ferrers, Earl of Derby, ancestor of John, who was summoned to Parliament as Baron Ferrers of Chartley in 1293, and of Sir Robert Shirley, Baron Ferrers, who in 1711 was advanced Viscount Tamworth and Earl Ferrers. The Castle, having been forfeited by Robert de Ferrers, eighth and last Earl of Derby, on his attainder *temp.* John was subsequently restored to his house. A residence, constructed mostly of timber, that took its place was consumed by fire in 1781. It had been the home of the Devereuxs, Earls of Essex: Sir Henry Shirley married in 1615 Dorothy, daughter of Robert, the favourite of Queen Elizabeth. Chartley Hall, a moated house in the domestic Gothic style, embodies the prison-lodging of Mary Queen of Scots, whence she was taken to Fotheringay Castle, but the greater part of the mansion has been destroyed by fire on two occasions since that time.

Ironmongers' Hall, Fenchurch-street.
ADVERTING to Messrs. Huhard and Moore's designs for rebuilding the Company's Hall, as published in our number of May 28, we may mention that the present hall was built in 1748 after plans and designs by Thomas Holden. The stone front consists of a rusticated ground floor and two floors above, the middle portion of the façade has an order, on the first and second floors, of four Ionic pilasters with an angle-pediment, in the tympanum of which are the arms of the Company between two large cornucopieæ. In the middle of the order, and above the central doorway, is a Venetian window, having four Ionic columns, half-engaged, and over that is an oval-shaped opening, glazed for light; the spaces on the same line between the two pilasters on either side are pierced with similar circular openings. The first-floor windows of the two sides have rounded heads, those of the ground floor are squared. An urn surmounts the pediment, and there are urns upon the open balustrade. From the vestibule, which is divided with Tuscan columns, a large staircase leads to the banquetting hall, measuring 70 ft. by 30 ft. and 30 ft. high, which about sixty years ago Jackson and Son decorated, after the Louis XIV. style, with papier-mâché and carton-pierre imitative oak. The Company, who possess a portrait by Gainshorough of Admiral Viscount Hood, presented by him in 1783, was first incorporated in 1464; their first hall, on the present site,

had a gate-house, refectory, and armoury; in 1565 the Company of Court Letter Scriveners were incorporated with the Ironmongers, who constituted a guild or craft in the early years of the XIVth century.

Barnet Isolation Hospital Competition.
THE Barnet Hospital Committee at their meeting last week again discussed the question of appointing an assessor in the case of the Isolation Hospital competition and finally decided against it, the absurd argument that it would be unjust to the competitors to appoint an assessor now, when they did not advertise it, being again brought up. This looks rather like a convenient argument brought up to give a show of justice to a proceeding which is only influenced by economical considerations; an assessor will have to be paid, and they do not want to pay him. It is noticeable that one of the arguments was that they had on their Board Mr. Hasluck, who was a professional gentleman; and that Mr. Hasluck himself subsequently said that he knew nothing whatever about isolation hospitals, "that it was a question of life and death in deciding the character of the new building, and that if any defects should afterwards he discovered the responsibility resting on the Committee would be a very serious one." Mr. Hasluck is evidently a sensible man, and it is a pity that his advice was not listened to.

Eton War Memorial Competition.
THE Eton War Memorial Competition, about which we published a letter last week from "Etonian," seems to have been conducted in rather an odd manner, from an architect's point of view. The circular sent round to the competitors, announcing the award of the premiums by the assessor, states that the plans have obtained warm approval from the assessor, and that "whatever course be finally adopted, they will be of the greatest service to the committee." Further on it is stated that "the Committee of Taste are not yet in a position to make any further statement in the matter, or to suggest the adoption of any one design, or the combination of any two or more designs" (the italics are our own). The "Committee of Taste" must be in need of a little sound architectural advice if they really suppose that a "combination of two or more designs" is a proceeding either reasonable in itself or likely to be accepted by the architects. If the professional assessor (Mr. Norman Shaw) saw this circular, we cannot understand his letting it go out without a protest. We presume the Committee of Taste is entirely an amateur one; certainly its ideas about architectural design seem to be of a very amateurish description.

PORTLAND-PLACE, WEST KENSINGTON.—Steps are being taken for the affixing of a tablet upon the front wall of No. 7, Portland-place, to commemorate the circumstance that Coleridge occupied the house in 1810. Portland-place forms a row of houses on the west side of a turning which leads, southwards, out of the high road to Hammersmith, into Avonmore-road, and overlooks the railway line at the former Caunter's Bridge, near Addison-road station. A local tradition avers that Coleridge, either before or after his sojourn in Portland-place, lodged for a while in the adjacent Edwardes-square.

RECENT DISCOVERIES IN THE ROMAN FORUM.

The discovery of a group of prehistoric vases in a specially-constructed receptacle in the base of the equestrian statue of Domitian has recently been brought to the notice of the readers of the *Builder* (May 28; p. 574). The character and meaning of the deposit has not yet been certainly determined; but it is worthy of notice that the vases form a group of several varieties, such as is found in the tombs of the VIIIth century B.C., and that they resemble very closely indeed not only the pottery of the inhumation burials* of the necropolis close to the temple of Antoninus and Faustina, but that of other cemeteries of the same period in the neighbourhood of Rome. They cannot, therefore, inasmuch as they are the products of a relatively advanced art, be compared with the primitive vases which the Arval brethren worshipped, and which appear to have been of a rough and undeveloped style. It seems most probable, on the whole, that, as I said before, they are the contents of a tomb which was disturbed by the laying of the enormous concrete foundation for the statue.

Another discovery of far greater historic interest occurred in the latter half of April, quite close by; for, at a distance of about twenty yards to the north-west, Commendatore Giacomo Boni, who has directed the recent excavations since they began in 1898, noticed a line of blocks of travertine, which ran in a direction out of correspondence with the lines of the Imperial Forum, but agreeing with the orientation of the Republican period. The removal of some of the travertine slabs of the pavement of late Imperial times which now covers the area of the Forum showed that these blocks formed the north side of an enclosure of irregular shape, but measuring roughly 30 ft. from north to south, and 20 ft. from east to west. This enclosed space had originally been paved with rectangular slabs of tufa, but the upper surface of these had subsequently been hacked away, and over them travertine slabs had been laid—except in one place near the south end. Here the tufa slabs were left to their original height, and others laid over them, so that this portion is 4 in. or 5 in. higher than the rest of the pavement; it is twelve-sided, about 10 ft. across, and was apparently enclosed by a beltstrade of slabs of stone, which ran in a circle round it.

This area seems to correspond in position with what we know of the site of the Lacus Curtius, which, as Roman writers tell us, was situated in the centre of the Forum. According to the most popular legend, the spot took its name from Marcus Curtius, who, when a chasm opened in the Forum and the gods demanded the sacrifice of the best that Rome contained, leapt, in full armour, mounted on his charger, into the abyss, which at once closed on him. There were, however, other versions, according to one of which the name came from the leader of the Sabines in their attempt to take vengeance on Romulus for the rape of the Sabine women. His name was Metius (or Mettus) Curtius, and it was said that when hard-pressed he had taken refuge in the marsh, and hardly managed to escape from it. The third form of the story merely traces the name to one Caius Curtius, who, during his consulship, made an enclosure round the spot where a thunderbolt had fallen. This might perhaps be an attempt to account for the existence of the twelve-sided space at the south end; but the irregular shape of the main precinct agrees better with the first two versions of the legend, which are those more widely current. And with these, and more especially with the second, agrees the representation on a relief now in the Palazzo dei Conservatori (belonging itself to the late Classical period, but probably a copy of a much older original) of a heavily-armed horseman whose steed is stumbling in a bed of reeds.

The identification of the paved area with the site of the Lacus Curtius (which was, we know, dry land at any rate in the Augustan age) seems thus eminently probable; and it is worth noting that the constructors of the system of underground passages beneath the area of the Forum (*Builder*, January 2, 1904) expressly avoided tunnelling under the place, whether because of its sanctity, or because the ground was known to be marshy, or for both reasons; and that though the galleries themselves are entirely constructed of solid

concrete, owing to the amount of water which percolates through the subsoil of the Forum. Such discoveries as these help greatly in making ancient Rome more of a reality to us. We have not here, it is true, the original Lacus Curtius, but further excavations which will in time be undertaken below the level of the pavement which has recently come to light, and which probably belongs to the later days of the Republic, will, in all probability, throw light upon the origin of the legend.

THOMAS ASHBY, JUN.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

The annual meeting of the Association of Municipal and County Engineers was held at Shrewsbury on Thursday, Friday, and Saturday, July 14, 15, and 16. The new President, Mr. A. T. Davis, C.E., of Shrewsbury, is County Surveyor of Shropshire, and the first county surveyor to occupy the presidential chair of the Association. Mr. Davis has been an active and respected member of the Association for nearly a quarter of a century, has acted for some years as honorary secretary of the Midland district, and has been an elected member of the Council for a number of years. At the opening of the meeting the retiring President (Mr. W. Weaver, C.E., of Kensington) occupied the chair, and there were present the President-elect, Mr. A. T. Davis, Messrs. T. H. Yabbicom (Bristol), J. T. Eayrs (Birmingham), J. Lobley (Hanley), E. G. Mawhey (Leicester), O. C. Robson (Willesden), O. E. Winter (Hampstead), C. Chambers Smith (Sutton), J. D. Watson (Birmingham), J. P. Barber (Islington), J. S. Pickering (Cheltenham), A. Creer (York), J. Price (Birmingham), H. Richardson (Handsworth), J. E. Wilcox (Birmingham), A. H. Walker (Loughborough), J. Gammage (Dudley), W. C. Edlowes (Shrewsbury), M. Lea (Truro), A. D. Greatorex (West Bromwich), W. Welburn (Middleton), A. J. Price (Lytham), T. Caink (Worcester), J. A. Crowther (Southampton), W. H. Tressider (Falmouth), T. S. Yates (Waterloo), J. Eaton (Plymouth), J. W. Wardle (London), G. W. Lacey (Oswestry), W. H. Grieves (Buxton), R. S. Dorman (Armagh), T. W. A. Haywood (Battersea), R. A. MacBair (Lincoln), F. T. Grant (Gravesend), M. J. Fleming (Waterford), R. F. Vallance (Mansfield), C. F. Wike (Sheffield), J. P. Norrington (London), J. Parker (Hereford), C. Brownridge (Birkenhead), F. W. Nager (Walsall), G. Eaton-Shore (Crewe), and others.

The Mayor (Councillor W. F. Watkins) attended the opening of the meeting, and offered the Association a hearty welcome to the ancient and historic borough. He trusted that during their stay they would find many matters of interest in town and country.

Mr. W. Weaver (the retiring President) thanked the Mayor for his gracious and kindly welcome.

Mr. T. Cole (Secretary) read the Annual Report of the Council, which stated that the Association had now 1,060 members. The Council had awarded premiums of 10*l.* to Mr. A. D. Greatorex, of West Bromwich, for his paper on "Municipal Work at West Bromwich," and 5*l.* to Mr. N. F. Dennis, for his paper on "Some Municipal Works at Aldershot." The Council reported correspondence with the Local Government Board on the professional status of the municipal engineer. The committee still had the question of the model building by-laws under consideration, and a mass of evidence had been collected.

The retiring President moved the adoption of the report.

Mr. Yates (Waterloo) raised the question of the payment by local authorities of the expenses of members attending meetings of the Association.

Mr. T. Henry (Retford) and Mr. W. H. Grieves (Buxton), supported the suggestion.

Mr. J. Patten Barber (Islington) said the Local Government Board were very difficult to move, especially when the moving force was the Association. The position the Local Government Board took up was that they could not move at the suggestion of the Association of Officials; the representation must come from the local authorities.

The President promised that the matter should be carefully considered by the Council of the Association, and the report was then approved.

Mr. W. Weaver (Kensington) then moved an alteration in the by-laws to facilitate the amalgamation of the Scottish Association with the

Association. The alteration was to enable the Scottish members to join without the payment of an entrance fee, and allowing the Council to dispense with the provision of by-law 2, requiring members to hold a chief permanent appointment.

Mr. O. C. Rohson (Willesden) seconded the new by-law, which was carried unanimously.

On the proposition of Mr. T. H. Yabbicom (Bristol), the retiring President (Mr. W. Weaver, of Kensington) was thanked for his services to the Association during the past year.

President's Address.

The newly-elected President (Mr. A. T. Davis), in his inaugural address, having thanked the members for his election, assured them that during his term of office he would endeavour, to the best of his ability, to maintain the high position which the Association now occupied. Having been connected with the Association for close on a quarter of a century, he could not resist looking back to its early days and recalling the progress that had been made. He offered no apology for alluding to its early history, because he held that too much honour could not be given to those far-seeing men—Mr. Lewis Angell, Mr. James Lemon, Mr. Charles Jones, and others—who, recognising the advantages of a common bond of fellowship and professional interests, founded this society thirty-one years ago. It was reported that at the inaugural meeting, held on May 2, 1873, more than 100 engineers and surveyors of various towns had joined the Association. At the close of the last financial year this number had increased more than tenfold, the actual roll of the Association embracing at that date a total of 1,060 of all ranks. This interchange of experiences was of enormous advantage, not only to municipal engineers, but also to the councils they served, and the community in general. Indeed, he had no hesitation in affirming that the municipalities of this country had derived immense benefits from the Association in this respect. During the existence of the Association, while the population of the United Kingdom had increased by upwards of 10,000,000, with its concomitant crowding in the larger cities and towns, the rate of mortality had decreased from 21.3 in 1871 to 15.4 last year; and members might fairly claim, along with their colleagues the medical health officers, no small share in the diminution of human suffering and the prolongation of human life represented by these figures. The Council were doing their best to combat the two evils that militated so much against the professional status of the municipal engineer and surveyor—viz., insecurity of tenure, and the occasional appointment, by urban and rural councils, of unqualified men. The remedy seemed simple enough; it was only necessary to follow the precedent set in the case of the metropolitan medical officers of health, who were protected by the Local Government Board under section 108 (b) of the Public Health (London) Act, which was as follows:—"A medical officer of health shall be removed by the sanitary authority with the consent of the Local Government Board, or by the Board, and not otherwise." The principal reason for the Local Government Board exercising some control over the appointment of the London medical officers of health was that it would be detrimental to the interests of the public that such should be held by men unprotected in some way, seeing that their duties were of such a character as to bring them into conflict with vested interests, and to render them liable to unjust treatment. But surely these arguments were equally applicable to the engineer and surveyor, whether in London or the provinces, who in the conscientious discharge of his duties—e.g. in the administration of the by-laws, to mention only one instance, might incur the hostility of some person or persons placed in authority over him. But, apart altogether from the question of security of tenure, it was quite time that the practice of appointing incompetent men and the payment of disgracefully inadequate salaries should cease. The work of the municipal engineer involved the health of thousands, as well as the expenditure of enormous sums of money, and as both these subjects so intimately concerned the public, it was to be hoped that Members of Parliament might be induced to take the matter up. The proposed union with their Scottish *confères* would, he felt quite sure, prove mutually advantageous, and no man would be wanting on his part during his year of office to make the union a happy one. A ve-

* The inhumation tombs are here, as any rate, later in date than the cremation tombs (*Builder*, January 2, 1904, p. 3).

important work was being performed by the special committee appointed to make recommendations for the improvement of the Model By-laws issued by the Local Government Board, for both urban and rural districts. He sincerely hoped that the recommendations of the committee when submitted would be adopted by that board.

It would be universally admitted that very great advantages and economies must accrue from the standardisation of engineering materials, which was being carried on by the Institution of Civil Engineers with the approval of the Government and the co-operation of other institutions and societies, including their own. Interchangeability within proper limits must cheapen the cost of production, and it was gratifying to hear, on the authority of the chairman of the sub-committee which undertook the work of standardising tram-rail sections (Mr. W. Howard Smith), that since the completion of their labours and the publication of the standard sections and specifications scarcely a tram-rail of any other section had been rolled in this country. The Association was also represented on the Pipe Standardisation Committee now sitting under the chairmanship of Mr. Charles Hawkesley, past-president of the Institution of Civil Engineers. Their representatives were Mr. F. Griffith, of Leicester, and Mr. W. Watts, of Luton. This committee was making exhaustive inquiries with a view to standardising all classes of pipes, from rain-water pipes to the large steel and iron pipes for hydraulic power. For a very long period the troublesome problem of sewerage and sewage disposal had exercised the minds and engaged the serious attention of municipal and sanitary engineers, and for upwards of six years a Royal Commission had been making researches into its hidden mysteries. However, without waiting for the final report of the Royal Commission, one could easily see that the complex problem, if not solved, was approaching solution, and engineers, he thought, had acquired sufficient knowledge of natural and artificial methods of sewage purification to enable them, with adequate funds at their disposal, to produce an effluent of any chemical and bacterial standard value that might be required. That no one method was of universal application was as much an axiom to-day as ever it was. If suitable land in sufficient quantity could be purchased at a reasonable price he felt sure that the simple and natural method of irrigation would, in the majority of cases, prove the most satisfactory and economical, but where land was unavailable, equally good results might be obtained by artificial or biological methods. Be the method natural or artificial, however, he was convinced from practical experience and careful observations, that unless the works were entrusted to the management of experienced and thoroughly reliable men, whose aim was purification and not profit, failure and not success would be the result. If the recommendation contained in the third report of the Royal Commission was carried into effect, viz., "that the law should be altered so as to make it the duty of the local authority to provide such sewers as were necessary to carry trade effluents as well as domestic sewage, and that the manufacturer should be given the right, subject to the observance of certain safeguards, to discharge trade effluents into the sewers of the local authority if he wishes to do so," the difficulties of municipal engineers, in some towns at least, would be greatly increased. The fourth report of the Commission was pregnant with interest to all municipal engineers, but more especially to those whose districts contained tidal waters. The Royal Commissioners said: "The treatment of sewage, according to methods at present in use, cannot be relied on so as to alter its character as to allow of its discharge in the immediate neighbourhood of shellfish layings, without incurring appreciable risk of disease being communicated by the consumption of shellfish taken from such layings. In such cases either the sewage outfall must be removed or the layings closed." These observations had a much wider bearing than at first view appeared, as the whole question of sewage treatment and rivers pollution was involved. They were no doubt within measurable distance of the formation of river boards, composed of joint committees of county and county borough councils, under a central authority, with powers over watershed and drainage areas, to prevent pollution of rivers and other sources of water supply, to check waste, and to guard local interests, by prevent-

ing water being taken for sale outside a given area. When these watershed areas were formed it was to be devoutly hoped that they would eventually supersede the existing absurd administrative Local Government areas of the country. Whether our inland streams would ever be rendered pure enough, after storage and efficient filtration, to adopt as public sources of water supply he could not say, but it would be an enormous gain to the country at large if this desirable result could be achieved. Possibly a rigorous isolation of typhoid and cholera cases, and the sterilisation of their excreta before discharging them into the drains and sewers, might lead to such a consummation. It was notorious that many of our small towns and country villages were unprovided with water fit to drink, and were positively crying out for this necessity of life. It was anything but creditable that this state of things should be possible in these advanced days of sanitation. It proved conclusively that the law on the subject was ineffective, and that a change was absolutely and urgently needed. The county councils were doing their best with the feeble powers which, in this respect, they possessed, to bring about an improvement, but progress was very slow indeed. For some years past the County Council for Shropshire had been trying to induce several urban and rural districts devoid of a proper supply of water, to combine for the purpose of obtaining one, and eventually succeeded in grouping certain districts into a water supply board. This board promoted a Bill in the present session of Parliament, which, however, emerged from the ordeal of Committee curtailed to such an extent as to reduce its value and usefulness very considerably.

With reference to highways, he said, while traction engines and the heavy motor lorries were cutting up the roads, the users of swift-running light motors were demanding smoother and better surfaces which enormously increased the difficulty of the situation. The motor-car had brought in its wake a problem in the form of dust, the solution of which would in itself bring about this change. The clouds of dust raised by the motor-cars were principally caused by the sucker-like action of the wide pneumatic tyres of their small wheels. This action was positively injurious to the macadamised road crust, in that it sucked out the binding material which held the macadam in place, which was naturally followed by disintegration of the crust itself. This dust nuisance had exercised the minds of many people, and patent "dust-layers" were already in the market and were said to be a panacea for the evil, such as "Westrumite," "Pyne Oiline," and other oily liquids for sprinkling on the roads. These, however, were only palliative measures; they might prove very useful in special cases, such as automobile trials, race meetings, and other gatherings of a like character, but he feared they would prove too expensive for general permanent use. The real remedy must be founded on the principle that "prevention is better than cure," and their chief roads, at least, would have to be coated with an impervious material which would resist the sucking action mentioned, and, at the same time, be strong enough, together with the foundation coat, to bear heavy traction traffic. If this change was to be brought about without friction it must be done without adding materially to the present cost of maintenance, and he could not think of any better or more economical material for the purpose than tar-macadam. There was nothing new in the principle of mixing tar with road metal, but many of them must be interested in the experiments of one of their members in the use of selected furnace slag for the purpose, which, while yet warm from the furnace, was made to absorb the tar which it was alleged thoroughly saturated it and rendered it waterproof throughout. If this material was found in actual practice to be sufficiently tough to resist the wear and tear of heavy traffic the fact that it could be produced at a reasonable cost, especially in the neighbourhood of blast furnaces, would lead to its extended use, both in town and country, in the place of ordinary macadam. The gain to the travelling public from roads of this class would be of enormous value. Tractive force would be considerably reduced, especially when compared with that exerted under existing conditions, such as dust in summer and mud in winter, both of which conditions greatly increased resistance to traction; dust would be reduced to a minimum, and automobilists would be enabled to lay aside their unbecoming garments

for something more beautiful; the roads would be kept in a better sanitary condition, as rain, instead of injuring them, as at present, would have a cleansing effect on their impervious surfaces. With roads of good, hard, smooth surfaces—yet not too smooth on the steeper gradients—there would be less necessity for light railways and tramways which rendered the roads less commodious and useful for ordinary traffic. Motor omnibuses would take their place as means of communication between town and country, and would be much more effective, inasmuch as they could go to the very doors of the people. This would probably assist in arresting the migration of the country population to the towns.

It had often occurred to him that it would be much better that building by-laws should be abolished in favour of a general building Act. This would do away with the present anomaly by which builders were able to erect what they liked in one district where there were no by-laws, while perhaps in an adjoining district they were compelled to observe a rigid set of laws. Surely it would be better to fix minimum standards for town and country respectively, and make everybody adhere to them rather than to have rigid regulations in one district and none at all in another. However, so long as the law remained as it was, they must make the best of it. ♦

Mr. Robson (Willesdon) proposed a vote of thanks to Mr. Davis for his address, which was seconded by Mr. E. G. Hawbey (Leicester), and carried by acclamation.

American Sewer Design and Construction.

Mr. S. Hodgson, Assoc. M. Inst. C. E., read a paper on American sewer design and construction. He said the circumstances which led up to the construction of the Boston Main Drainage Works—distinguishing them from the metropolitan works, to be referred to hereafter—were commonplace enough. It was on record that in 1870 an aggregation of old city sewers discharged by about seventy outlets into tide-water, chiefly along the harbour front, with the customary results. In 1875 the problem was submitted to a commission of medical and engineering experts, who were asked to report as to the best means of providing main drainage facilities for the entire area of the city, having at that date a population of about 340,000 and occupying an area of 37½ square miles. A further area of 20½ square miles in the Charles and Neponset river valleys, naturally tributary to any system of this character, was also included in the reference, the entire 58 square miles lying to the south of the Charles river. The more thickly settled portions of the city itself obviously demanded preference in any remedial measures to be undertaken, and the physical features of the territory greatly favoured the claim. In view of these conditions, it was decided to proceed at once with the construction of the low-level system and to postpone the building of the high-level gravity sewer until such time as the increasing density of population and other causes should call for action in that direction. The harbour outfall works, on the other hand, were made of sufficient capacity to receive in addition the sewage of the entire high-level district, and an inlet for this purpose was provided at Squantum. The original works of the low-level system—known as the Boston Improved Sewerage—were constructed between 1877 and 1884 at a cost of 1,000,000. They comprised 25 miles of main and intercepting sewers, ranging from 2½ ft. to 10½ ft. diameter, located generally along the tidal margins of the city and lying mainly below the level of low tide; a pumping station at Old Harbour Point, where the sewage was lifted about 30 ft. through force mains into twin deposit sewers, each 8 ft. wide and 16 ft. high, in which heavy matters settled before the sewage reached a 7½ ft. tunnel, 7,169 ft. in length, crossing under Dorchester Bay; an outfall sewer, 11 ft. high and 12 ft. wide, 5,900 ft. in length, built on an embankment and connecting the tunnel with open reservoirs on Moon Island, where the sewage was stored during the latter half of the ebb tide and the whole of the flood tide; and a discharge conduit leading to the tidal currents in the harbour. The original capacity of the reservoirs was about 20,000,000 gallons, but additions made within the last five years had increased this to 40,000,000 gallons. Similarly the original pumping plant, with a nominal capacity of 42,000,000 gallons per day, had been brought up to a total of 150,000,000 gallons. The system was designed for an ultimate population,

on the 15 square miles, of 600,000, a mean of sixty-three per acre. The water supply was taken at 62 gallons per head per day, with a maximum rate of flow equal to twice that volume, and provision was made for a volume of rainfall, actually reaching the sewers, equal to a depth of $\frac{1}{4}$ in. falling in twenty-four hours. The works were constructed, and were still owned and operated, by the City of Boston. They provided, beyond a doubt, for the most urgent part of the general sewerage problem of the metropolitan district, but left a large and growing population without any satisfactory means of sewage disposal. One result of this was the gradual extension of the city area made tributary to the pumping system, a process of no avail in relieving those outside areas which had been recognised as forming part of any rational drainage district. The problem, as affecting those portions of the Mystic and Charles river valleys, was complicated by the difficulty, in many cases amounting to impossibility, of dealing with the sewage of any given area within the borders of the municipality affected, and it was finally recognised that no authority, other than that of the State of Massachusetts, was sufficiently comprehensive to embrace the entire district to be served. Successive commissions, beginning with the Metropolitan Drainage Commission of 1881, made a study of the situation, but the matter was brought to a head by the State Legislature of 1887 directing the State Board of Health to consider and report on a general system of main drainage for the relief of the two valleys, comprising a metropolitan area of 114 square miles. The report, submitted in 1889, recommended the division of this district into two parts, with an independent harbour outfall for the larger portion (72 square miles) north of the Charles river, containing a population, in fourteen municipalities, estimated at about 280,000 in 1890. The execution of the scheme was begun in May, 1890, the Charles river system being completed two years later. The execution of the north metropolitan system, carried on simultaneously, was a much larger and more difficult undertaking, and it was not until the spring of 1896 that the entire system could be said to be in operation. The total cost of the original works of both systems amounted to about 1,200,000. The author then proceeded to deal with the various additions to the original works up to 1904. The expenditure on metropolitan systems was met by contributions from the various municipalities, devised to cover the repayment of principal and interest in forty years, and the annual cost of maintenance and operation was likewise borne by the respective areas. In order to bring the payments under the first head more nearly into proportion to the increased use of the system by a growing population, it was provided by the Act that, instead of refunding one-fortieth of the entire sum in each year, the payment should be apportioned as follows: 5-fortieths in the first ten years, 6-fortieths in the second ten years, 13-fortieths in the third ten years, and 15-fortieths in the fourth ten years. The bonds bear interest at the rate of 3 per cent. per annum. While he had been enabled to place a concrete example before English municipal engineers, there were some leading features, affecting American sewage works generally, to which it might be well to refer. Among these the most prominent and important was the tendency towards the separation of rainfall from sewage which the late Sir Edwin Chadwick laboured to promote in Great Britain. American ideas on this subject were of a very advanced type, inasmuch as they did not tolerate the exclusion of roof and yard water from the rainfall conduits. It must be said of Americans, in this as in other respects, that they had the courage of their convictions. As exemplifying this characteristic, the author might say that while he had never known in America of a case in which ventilating manhole grids were closed on account of alleged nuisance, this step was becoming increasingly common as a means of preventing the ingress of rain water to "sanitary" sewers. This procedure was greatly facilitated by the growing practice of dispensing with disconnecting traps between houses and the street sewer, but this had not been brought about by an objection to open grid sewer ventilation. The absence of complaints in this respect had, in fact, always impressed him as being one of the most remarkable facts connected with American sewerage works, and he was constrained to attribute this immunity, at least in part, to the more generous use of water demanded by American ideals.

The study of rainfall records, and the application to them of available formulae, had resulted in America in a noteworthy expansion of ideas in regard to the dimensions of rainfall conduits. On the other hand, the rigidity with which it was regarded as possible to adhere to the exclusion of rainfall from "sanitary" sewers had had its effect in reducing the size of the latter to an extent otherwise impossible. In this way, 8-in. pipes might be said to be the standard for ordinary street sewers, a fact exemplified in the system designed by American engineers for the City of Havana in 1900, in which 83 miles, out of a total of 124 miles, were of that dimension. The use of small pipe sewers carried with it the obligation of limiting the ingress of subsoil water, as conforming to that general restriction of volume which was aimed at in "sanitary" sewers. Contrary, however, to English practice, what were known as patent pipe joints were not used, reliance being placed upon the filling of the annular spaces with Portland cement, generally mixed with a small proportion of sand to prevent cracking.

Mr. J. Price (Birmingham) said the paper was interesting in that it dealt with engineering in another country. When they looked at the main features, and saw they were dealing with a population of sixty-three to the acre, and the water supply was taken at 62 gallons per head per day, and that, owing to the increase of the impermeable area, the consumption of water had risen to 100 gallons per head per day, they would see what a different problem they were dealing with in America to what they were in England. If they were going to have 100 gallons of water per head, with only a small quantity of sewage in it, they were getting very near the point at which they could use the storm overflow. With reference to the separation of storm water from the sewage at Birmingham, with a partial separate system they could eliminate about three-eighths of the discharge in storm time. In the future they would probably be able to raise the proportion of storm water to five-eighths. The Boston method of dealing with the financial question was new; at any rate, he knew nothing like it in England.

Mr. E. G. Marbey (Leicester) mentioned that in Leicester the late Mr. Gordon introduced a separate system by which he succeeded in cutting off about one-half of the rain water from the foul water sewers.

Mr. Fryce (Lytham) remarked that if street grids were never closed in America on account of complaints, American sewers must be better ventilated than they could ventilate sewers in this country, or they must flush them more, or the people must be more long-suffering than the English people were, because he did not see how it was possible to avoid some smell if the ventilator was at the ground level.

Mr. S. G. Hodgson, in reply, said the amount of supervision they got on engineering works in America was infinitely greater than anything known in England. They got more money to do the job, and they got more highly-skilled men to do the work. There was a more liberal and generous spirit in regard to the design and supervision of engineering work than he was able to find in England.

"The Sewage Problem Solved."

Mr. W. D. Scott-Moncrieff read a paper entitled, "The Sewage Problem Solved." He said that in the paper which he read to that Association at Kensington last year, he took the opportunity of stating as clearly as he could what the conditions were which might be regarded as essential to the successful application of bacterial processes to the purification of sewage. These conditions were (1) after subjecting the sewage to that amount of anaerobic fermentation which was required for the breaking up of the organic matter into unstable compounds, capable of being fully oxidised to nitrates by the action of aerobic organisms—providing the means by which the zonal changes which take place in downward filtration can be carried on regularly and without any serious alterations in the environment at any stages of the process, such as occur in the "contact" system, in other words uniform distribution. (2) Means by which the aerobic organisms are supplied with no more than the maximum amount of nutriment that they are capable of digesting, in any given time. (3) Means by which a time of rest between each meal is secured so as to avoid the development of gelatinous growths in the filter bed. (4) Means by which the organisms are provided with an air

supply proportionate to the amount of nitrification demanded by different kinds of sewage. If these four conditions were under control, to obtain the best results, it was necessary to know, in exact terms, the measured value of the four following factors:—(a) The quantity of air necessary for the life processes of the organisms. (b) The best rate of flow per unit of filtered surface. (c) The best period of rest between each discharge. (d) The depth of filter required to produce the necessary standard of purity in the effluent. He thought he might claim this as his system, seeing that even now he was the only person who had recognised and advocated that the above factors were the necessary and only conditions demanded by nature in order to obtain complete and final success. The author, on the occasion of the Kensington meeting, described an apparatus which was designed for this purpose, and it was the object of the present paper to show from the actual results, not only that the apparatus had realised all that he expected from it, but that it had even surpassed his most sanguine anticipations. In the able hands of Mr. Dill, manager of the sewage works at Staines, backed up by his surveyor, Mr. Barrett, a new light had been thrown upon the entire subject of sewage disposal and a complete revolution of all our previous ideas on the problem had been inaugurated by the use of this machine. The author's experiments at Ashstead, so long ago as 1898, had prepared him to expect some such result, but even he must confess to something akin to a feeling of wonder when the apparatus showed that in so short a period as ten days, which had hitherto been regarded as wholly insufficient for the ripening of a percolating filter, a strong brewery sewage, taken as it arrived on the works, could be purified to the extent of over 80 per cent. in its aluminoid ammonia through only 4 ft. of gravel, gauged to pass a 1-in. mesh, and rejected by a $\frac{1}{2}$ -in. mesh. This marvelous result was obtained not by any new or by an unknown scheme, but by a process which was quite familiar to every one present, by simply doing what he had all along maintained was essential, viz., following the demands of nature implicitly and in all respects. At Stanwell, where the Staines disposal works were situated, the sewage was conveyed from an extensive district, reaching at some points as much as five miles from the outfall, by means of Shone ejectors. It was a strong domestic sewage heavily charged with brewery refuse, and with the trade waste from large linoleum works. Immediately over the sewer, where it was open within a few feet of the mixing-house, and before it had been treated in any way, a Worthington pump, so small that it was quite portable, and which was driven by compressed air, was arranged so as to draw sewage from a short length of suction-pipe provided with a strainer at its intake about 2 ft. from the pump a relief valve was fixed on the discharge-pipe (which was $\frac{1}{2}$ in. in diameter) for the purpose of avoiding unnecessary strain on the pump, and to give a less jerky discharge. Immediately over the testing-machine itself a small tank was arranged, into which there was a continuous flow of sewage from the Worthington pump, all the sewage beyond that which was being tested passing away through an overflow pipe provided for the purpose. In this way a continuously-changing sample, varying with the sewage as it arrived at the works, was constantly available. In the small tank further straining was provided for, with the result that the apparatus could be absolutely relied upon to work automatically with only a few minutes' attention during the course of the day. It should be noted that, in any case, the liquid, as it was discharged upon the testing apparatus, being crude sewage, was never so free from suspended matter as the effluent coming from a well-arranged hydrolysing tank. The accuracy of the discharge, which took place through an orifice of a fixed diameter, was secured by an arrangement by which a small vertical delivery pipe was made adjustable by a gland and stuffing box that allowed it to be raised or lowered, thus altering the head of liquid so as to obtain any required rate of flow. The rate of discharge was a little over 8 pints per sq. ft. per hour distributed over the upper surface of the filter. The period between each discharge was four and a quarter minutes, and the amount of air being asperated through the filter was at the rate of 4 cubic ft. per hour. If this be taken in gallons, the air supply in terms of that measure was nearly 8 gallons

per ft. of filter surface per hour, or nearly 3 gallons of air per cubic foot of the air space in the filter, allowing about one-half of its cubic contents to be occupied by the filtering material. Taking the air supply in its relation to the flow of sewage, it was nearly at the rate of 8 gallons of air per gallon of sewage per hour. No elaborate analyses were required at these early stages, and only three samples were taken—one of the crude sewage and of the effluent as it came from taps Nos. 4 and 6. The result proved that the filter was already actively at work, the oxygen consumed in the cold in four hours having fallen from 6.15 in the crude sewage to 1.52 at the fourth foot of filter, and gone back to 1.56 at the sixth tap. This showed that everything was going satisfactorily, and so the same conditions were maintained with absolute uniformity until the fifteenth day, when samples of crude sewage, and of the effluent from the fourth tap, were taken in order to estimate the amount of purification that was being obtained in terms of reduction of the oxygen consumed, and of the free and albuminoid ammonia. These proved that the bacterial activity was progressing satisfactorily. On the twenty-ninth day a more elaborate series of analyses were taken, which dealt with the crude sewage and the effluent from the third, fourth, fifth and sixth taps. The results of the improved conditions, together with the greater maturity of the filter, was clearly indicated by the diagram, in which the fourth foot of filtering still showed excellent results, with a curious set-back both in the free ammonia figures between the fourth and fifth tap, and of the oxygen consumed and albuminoid ammonia between the fifth and sixth. There was a trace of nitrite and 4 of nitric nitrogen per 100,000 parts. They next came to a still more elaborate series of analyses which were taken seven days later on June 22, being the thirty-sixth day from starting, the conditions having been kept absolutely uniform since the twenty-ninth day. The nitrite had risen from a trace to 2 parts per 100,000, and the nitrite had exactly doubled. The lines of progressive purification at the various filtering depths had become much more regular, showed that far the greater portion of the work was carried out between the surface of the filter and the third foot of depth, and that the comparatively small amount of purification between the third and sixth foot had been effected without the set backs which were in evidence when the air supply was less. The author wished to point out that all these results had been obtained under conditions that as themselves were very far from being favourable, either in respect of the maturity of the filter as a bacterial medium of oxidation, or the condition of the liquid which was taken as it arrived at the works, or the rate of flow, which was probably excessive for this particular sewage. He was quite satisfied that these results were due as much as anything to the uniformity of conditions which were maintained, as to allow of the organisms taking up their work in zones, where each colony could work with an undisturbed environment. The proofs of the importance of this uniformity was forthcoming at Ashted, where the mere displacement of a tray led to an upsetting of the process, from which it required two or three days to recover. In these investigations the same element was strongly in evidence, because all the samples immediately deteriorated when the air supply was doubled, although the altered condition was of course ultimately favourable to the improvement which supervened as soon as there was time for the organisms to adjust themselves to the new environment. The author had not yet come across a scheme for the disposal of sewage by bacterial oxidising processes which this apparatus was not capable of clearing up by giving results in exact and comparable terms, and it must be capable of doing so if it included all the factors of the problem and enabled them to be measured and compared. The investigation at Staines had been undertaken upon practical lines, with a practical object in view. The first inquiry had been to discover what the most unfavourable conditions, which, in this case, at any rate, might be looked upon as the least expensive, could be made to yield before considering those that were easily provided, which cost money. It was now quite certain that the Ashted results could be repeated, at least in the great majority of cases, and that an effluent giving a percentage of 90 per cent. of oxidised to oxidised nitrogen was within the reach of

every one who provided the conditions revealed by the apparatus described.

Mr. Watson (Birmingham) said, though his views agreed very largely with those of Mr. Moncrieff, he felt they had not yet reached a solution of this question. The sewage at Staines was a comparatively weak sewage, which they could screen, and they were bound to get very different results from it than from a sewage which, after hydrolytic change, had such a quantity of suspended matter that they could not possibly get an apparatus like this to work without a good deal of attention. He would not like them to think they would obtain perfect results from the tester, nor that they would be able to obtain results without some little trouble and expense, because there was nothing obtained in this world without trouble and expense.

Mr. J. E. Wilcox (Birmingham) said the first thing they had to recognise was the requirements of the Local Government Board. They might say they had a tester, and with it they had produced certain results from a filter of a certain depth, but the Local Government Board would say they knew nothing of their tester, they would have to comply with the requirements of the Board, and if they did not comply they would not get a loan. In designing the distributor which was in use at certain works, he ventured to say Mr. Moncrieff went much further in the solution of the sewage problem than in the design of this tester.

Mr. Bush (Sudbury) asked whether the apparatus could be applied to contact beds.

Mr. Hall (Staines) said that, as Mr. Moncrieff had stated, all the factors could be accurately measured. After eight weeks' experiment with the tester, he was more fully convinced than ever that these factors when applied to sewage would be the means of giving them reliable data.

Mr. Caink (Worcester) suggested that the air should flow through the filters in the opposite direction to the sewage. It seemed to him that they would then get better results.

Mr. J. S. Pickering (Cheltenham) thought the author was adopting the right course with this apparatus as a means of testing some of the conditions which take place on a larger scale. But he ventured to suggest that Mr. Moncrieff had too hastily drawn conclusions from his experiments.

Mr. A. Creer (York) said the crux of the whole matter was the disposition of the Local Government Board in dealing with municipalities. The results obtained from experiments had very little weight with the Local Government Board in inducing them to depart from the hard and fast line they had laid down.

Mr. Moncrieff, in reply, said the apparatus would not apply to contact beds, which, in his opinion, were hopelessly unscientific.

FACTORY AND WORKSHOP ACT, 1901.

We have received from the Home Office the following memorandum, endorsed "Form 718, June, 1904," in relation to the provisions of the Factory Act in regard to accidents:—

"MEMORANDUM AS TO BUILDINGS IN COURSE OF CONSTRUCTION OR REPAIR.

Certain provisions of the Factory Act, relating to the reporting of accidents and examination of steam boilers, apply:—

(1) to premises on which machinery worked by mechanical power is temporarily used in the construction of a building or in structural work in connexion with a building, and

(2) to buildings over 30 ft. in height which are being constructed or repaired by means of scaffolding, whether machinery be used or not;

and the person using any such machinery, or employing the persons engaged in the construction or repair, is responsible (under penalty) for seeing that the provisions referred to are duly observed.

Reporting of Accidents.—When there occurs on such premises or buildings any accident which causes to a person employed therein such injury as to prevent him on any one of the three working days next after the occurrence of the accident from being employed for five hours on his ordinary work, written notice (Form 43) must be sent forthwith to H.M. Inspector for the district.* Every such accident should also be entered in a register kept for the purpose on the premises (Form 73). And, further, if the accident is fatal, or is produced by machinery moved by power, or by a vat or pan containing hot liquid, or by explosion, or by escape of gas or steam, a similar written notice (Form 43) must also be

* If the address of the District Inspector is not known the notice may be forwarded under cover to the Chief Inspector of Factories, Home Office, London, S.W.

sent forthwith to the certifying surgeon for the district, whose name and address can be ascertained from the Inspector where necessary.

In the year 1903, 115 fatal and 2,044 non-fatal accidents were reported in connexion with buildings in course of construction or repair. It is, however, believed that these returns are incomplete, and the Inspectors are instructed to take proceedings against the persons responsible, if notice of accident is not sent.

Steam Boilers.—Every steam boiler used in the places and premises in question must be maintained in proper condition, provided with a proper safety valve, steam gauge and water gauge, and thoroughly examined by a competent person every fourteen months. A signed report of the result of the examination must be entered within fourteen days in a register to be kept for the purpose on the premises (Form 73).

If notice of the commencement of a building is given to the Inspector, he will forward an abstract (Form 57), containing a summary of the provisions of the Act relating to buildings.

The official forms can be obtained, directly or through any bookseller, from Eyre and Spottiswoode, East Harding-street, London, E.C.; Oliver and Boyd, Edinburgh; and E. Ponsonby, 116, Grafton-street, Dublin.

Safety Precautions.—The following suggestions, if carried out, would tend to reduce the number of accidents occurring on buildings in course of construction or repair. They are based upon those contained in a Home Office memorandum issued to the building trade in 1902.

(1) Every working platform more than 8 ft. from the ground should, before being used, be provided throughout its entire length on the outside and at the ends:—

(a) with a guard rail fixed at a height of 3½ ft. above the platform. Openings may be left for workmen to land from the ladders and for the landing of material;

(b) with boards fixed on edge, rising at least 7 in. above the platform, and with their lower edges resting or abutting on the scaffold boards. Openings may be left for workmen to land from the ladders.

(2) All "runs" or similar means of communication between different portions of a scaffold or building should be at least 18 in. wide. If made of two or more boards they should be so arranged as to prevent unequal sagging.

(3) Scaffold boards forming part of a working platform should be supported at each end by a putlog, and should not project more than 6 in. beyond it, unless lapped by other boards, which should rest partly on or over the same putlog and partly upon other putlogs.

(4) Ladders should rise some feet above the place they give access to, and should have a level and solid footing, and be securely fixed at the top point of rest.

(5) Loose putlogs or other timber should not be allowed to remain projecting from the face of the scaffold where hoisting or lowering of material or plant is being carried on.

(6) Where the scaffolding has been sublet to a contractor, the employer should satisfy himself, before allowing work to proceed thereon, that it complies with the conditions named above, and that the material used in its construction is sound.

B. A. WHITELEGGE,
Chief Inspector of Factories.
Home Office, June, 1904."

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THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE JUNE EXAMINATIONS.

The Preliminary Examination, qualifying for Probationership R.I.B.A., was held in London and the undermentioned provincial centres on June 7 and 8. Of the total number entered—viz., 251—58 were exempted from sitting, and the remaining 193 were examined, with the following results:—

Centre	Number Examined	Passed	Relegated
London	84	61	23
Belfast	3	3	0
Birmingham	9	8	1
Bristol	12	10	2
Cardiff	9	5	4
Exeter	4	3	1
Glasgow	5	4	1
Liverpool	4	2	2
Leeds	24	18	6
Manchester	19	13	6
Newcastle	15	11	4
York	5	5	0
	193	143	50

The passed candidates, with those exempted—201 altogether—have been registered as Probationers. The following are their names:—

M. S. R. Adams, Bedford-park, Chiswick; A. D. Aitken, Airdrie, N.B.; E. G. Allen, S.

Woodford; P. R. H. Allfree, Clerkenwell, E.C.; J. D. Ashley, Sneyd-park, Bristol; H. S. Badenoch, Newcastle-on-Tyne; G. B. Baird, Bridgeton, Glasgow; C. H. Baker, Kingston-on-Thames; F. N. Bamford, Leytonstone, Essex; T. P. Bausor, Cambridge; W. Barraclough, Barnsley; J. B. Barrow, Barrow-in-Furness; F. J. Barton, Bridgewater; V. Cinatti, Batalha-Reis, Notting Hill, W.; V. Beer, Southville, Bristol; S. G. Bentley, Farsley, near Leeds; V. H. Birbeck, Cottingham, Hull; A. E. Birmingham, Cliftonville, Margate; J. E. Bolam, Blaydon-on-Tyne, co. Durham; T. H. Bolton, Arley, Leeds; C. G. Boucher, London; T. Braddock, Wimbledon; F. H. Brazier, Windsor; R. B. Brierley, Bedford; C. Bristol, West Norwood, S.E.; G. A. Bryan, Knightsbridge, S.W.; A. G. Bullock, New Southgate; J. E. Bullock, Walton-park, Cleveon, Somerset; J. S. Burgess, Acton Hill, W.; F. T. Bush, Crouch Hill, N.; C. H. Calvert, Nottingham; J. Carey, Slepther's Bush, W.; H. Carter, Liphook, Hants; A. J. H. Clarke, Dromore, co. Down; R. H. L. Cock, The Boltons, S.W.; C. B. Cole, Exeter; R. L. Collingwood, Richmond, S.W.; F. S. Cooper, Herne Bay; E. C. Core, Bayswater; A. R. Corwell, Hanley, Staffs; D. J. Corrigan, Duffus, Elgin; L. V. Cousins, Taunton; C. Diodati Cox, Shepherd's Bush, W.; T. H. Crawshaw, Barnsley; C. K. Crichton, Perth; R. Cromie, Lavender Hill, S.W.; J. A. Crush, Lavender Hill, S.W.; J. C. Davies, Pentreoph, Morriston, S. Wales; H. D. Dawson, Faversham; W. F. Dawson, Leeds; W. R. Dawson, Halifax; J. L. Denman, Brighton; I. Dixon, Wavertree, Liverpool; F. Donaldson, Bishop Auckland; F. J. Drake, South, Southsea; W. B. Y. Draper, Kensington; B. A. Dyer, Hereford; T. Eager, Holywood, Belfast; A. R. Eaton, Forest Gate, E.; J. M. Fairweather, Dublin; J. H. Farrar, Harehills, Leeds; J. Farrell, Sydney, N.S.W.; G. R. Farrow, Clapham Park, S.W.; E. G. Fidler, Caversham, Oxon; F. H. Fitzgerald, Hither Green, S.E.; T. O. Foster, Ealing, W.; J. A. Fowler, Hastings; F. B. Fulker, Salisbury; J. V. Gifford, Croydon; E. H. Gibson, Harrogate; G. Gifford, St. John's Wood, N.W.; W. Gill, Stanimirey, near Leeds; W. M. Gillow, Alderley Edge, Cheshire; T. G. Gilmour, Glasgow; G. N. Glazebrook, Plymouth; H. Goldstraw, Hanley, Staffs; C. Gordon, Harrow-on-the-Hill; W. G. Gradon, Durham; C. J. Graham, Chiswick, W.; E. R. Green, Sydney, N.S.W.; J. Grieve, Bradford; C. E. Gurney, Headingley, Leeds; H. W. Hall, Liverpool; C. E. Hanscomb, New Cross, S.E.; F. M. Harker, Brighton; W. H. Harrold, Alva, by Alho, N.B.; A. W. Harwood, Highbury, N.; S. T. Heath, Blackpool; J. D. Henderson, Berwick-upon-Tweed; W. T. Higgins, Hanslope, Stony Stratford; H. S. Higginson, Carlisle; S. Hirst, Marsden, Huddersfield; J. K. Hopkinson, Bury, Lancs.; H. E. Horth, Hereford; T. S. Hosking, Bristol; W. Howe, Barnsley, Yorks; W. Hoyle, Greenhithe, Kent; E. LaFontaine Hutton, Burnt Ash Hill, Lee, S.E.; G. E. Hunter, Gosforth, Newcastle-on-Tyne; J. S. Huxley, Eastbourne; W. J. Isaac, Warrington; R. M. Isaacs, Paddington, Sydney, N.S.W.; F. Jackman, Frimley, Surrey; F. R. Jelley, Swansea; C. G. B. Kaye, Harpenden, Herts; J. V. Kershaw, Burnley; F. E. Keymer, Gorleston, Great Yarmouth; D. Kibbler, Standford Hill; H. L. Kiddle, Tottenham, N.; J. S. Knyvett, Edgubston, Birmingham; E. Lamster, Darwen; A. L. Levy, Ladbroke Grove, W.; W. Lindsay, Glasgow; D. Longden, Langside, Glasgow; W. G. Lovell, Eastbourne; A. V. Low, Paddington, W.; J. G. N. Marchant, Mansfield; H. H. Meadus, Rochester; H. I. Meriman, Kensington, W.; K. H. Milne, Strand, W.C.; C. W. Mitchell, Shirley, Southampton; H. W. Mole, Newcastle-on-Tyne; E. S. Munt, Balham, S.W.; F. A. Murray, Pollokshields, Glasgow; S. A. Neave, Lonqueville, Sydney, N.S.W.; C. J. Newbery, Battle; E. A. Nicholl-Garrett, Herdrol; W. Nicol, Blackburn; G. R. Oddy, Northwram, Halifax; G. Parker, Barrowbourne, Worcester; G. H. Parry, Upper Warlingham, Surrey; W. H. Pearson, Hull; V. H. Peart, Gorleston-on-Sea, Great Yarmouth; F. R. Priest, Clapham Common, S.W.; F. A. M. Rawes, Colleton Green, Exeter; W. S. Read, S. Hampstead, N. W.; P. Richards, Southampton; H. T. Richardson, Handsworth Wood, Birmingham; G. A. Richards, Walton Park, Cleveon; W. W. Roberts, Maidenhead, Berks; H. M. Robinson, Coventry; B. Robson, Scarborough; W. A. Rodger, Cardiff; J. A. Rogers, West Hampstead;

C. H. Ross, Balham, S.W.; H. Ross, Belfast; H. A. Ross, Shepherd's Bush, W.; J. P. Salwey, Reading; R. T. Sault, Leicester; J. M. Scott, South Kensington, S.W.; E. D. Sherlock, Withington, nr. Manchester; N. V. Shiels, Randwick, N.S.W.; C. H. Simpson, London; W. H. Singer, Penarth; H. E. Smith, Balsall Heath, Birmingham; R. F. Smith, Hull; R. G. Smith, Reading; J. H. Somerset, Kersal, Manchester; A. W. Stabler, Shincliffe, nr. Durham; A. A. Stamford, Cambridge; A. W. Stelfox, Ormeau Park, Belfast; W. H. Stubington, Cranleigh; A. K. Sutcliffe, Felliscliffe, Ripley; C. A. Sutton, Nottingham; C. Swain, Baxton; E. A. Taylor, Wollstonecroft, North Sydney, N.S.W.; S. P. Taylor, Hanley; G. Thomas, Sketty, R.S.O., Glam.; N. D. Thompson, Whytelade, Surrey; E. V. Todd, Blackpool; Niall Tom, Cardiff; J. W. Tove, Lytham; A. Turnbull, Sunderland; F. L. Turnbull, Newcastle-on-Tyne; W. T. Turner, Redburn, Barnsley; F. A. Vernon, West Dulwich, S.E.; H. C. Walker, Ulverston, Lancs.; A. R. Walton, Cullercoats, Whitley Bay, R.S.O., Northumberland; F. D. Ward, Hastings; S. J. Ward, Northampton; F. C. Webster, Broughty Ferry, Scotland; W. R. Webster, Aberdeen; A. Welford, Brondesbury, N.W.; R. H. Whiteing, Beverley; J. Whitelaw, Pollokshields, Glasgow; N. Wizzell, Barnsley; J. Wilks, Stockton-on-Tees; E. S. Williams, Taunton; J. H. Willman, Wellingborough; R. S. Wilshear, Leicester; D. M. Wilson, Harpenden, R.S.O., Herts; R. Wilson, Lewisham, S.E.; W. H. Wilson, Burwood, Sydney, N.S.W.; G. C. Wingrove, Bow, Durham; G. W. Wintersill, Mill-hills-borough; A. S. Wood, South Kensington, S.W.; F. Worrow, Woodford, Essex; W. H. Wright, Battersea, S.W.; J. R. Young, Belfast; N. L. Young, Rotton, nr. Oldham, Lin's.

The Intermediate Examination, qualifying for Studentship R.I.B.A., was held in London and the undermentioned provincial centres on June 7, 8, 9, and 10. One hundred and forty-three candidates were examined, with the following results:—

Centre.	Number Examined.	Passed.	Relegated.
London	104	47	53
Belfast	2	1	1
Bristol	7	5	2
Glasgow	3	2	1
Leeds	13	10	3
Manchester	11	8	3
Newcastle	7	4	3
	143	77	66

The successful candidates, who have been registered as students, are as follows, the names being given in order of merit, as placed by the Board of Examiners:—

J. M. Smith, Chelsea, S.W.; R. W. Thorp, Headingley, Leeds; H. B. Richards, Butevant, co. Cork; J. J. Bock, Doncaster; J. T. Penfold, Hammersmith, W.; B. Watson, North Shields; V. Constable, Springburn, Glasgow; P. F. Warren, Norwich; C. H. Perkins, Wokingham, Berks; H. Wormald, Boston Hill, Leeds; Q. M. Bluhm, St. Anne's-on-the-Sea, Lancashire; L. Blanc, Earl's Court, S.W.; K. W. Matheson, Clapton, N.E.; H. A. Fairhead, Enfield, N.; T. H. Rhodes, Roundhay, Leeds; C. C. Makins, Harrow; J. W. Hepburn, London; B. W. Oliver, Barnstable; W. H. Rife, Leicester; C. P. Wade, Yoxford, Suffolk; G. Morland, Croydon; J. R. Hobson, New Eltham, S.E.; H. M. Spence, North Shields; R. C. Foster, Loughton, Essex; D. W. Clark, Twickenham; H. C. Holt, Bolton; T. C. Marwick, Edinburgh; R. G. Sniller, Taunton, Somerset; J. B. Burman, Elphinston, Birmingham; J. M. James, Weston-super-Mare; S. P. Smith, B.A., Oxon, Leeds; G. M. Stone, Tuxford, Notts; A. A. Carder, Clapham Common, S.W.; E. E. Hodder, Thornton Heath, Surrey; T. M. Bricksell, Shepherd's Bush-green, W.; H. A. Dalrymple, Edinburgh; H. E. Adams, Brixton, S.W.; W. Baird, London; J. B. Cubey, South Shields; H. B. Downs, Guiseley, Yorks; R. J. Tall, Gravesend; G. B. Bridgman, Camlen-square, N.W.; G. Dunn, London; C. M. Drevitt, Southampton, Lancs; W. H. Johnson, Great Yarmouth, M. Thompson, Doncaster; F. Osler, London; M. E. Stahl, Weston-super-Mare; H. L. Bown, Harrogate; C. B. Smith, Ipswich; W. A. Mackay, Seven Kings, Hford; G. W. Jarrett, Wandsworth Common; A. H. Kirk, London; W. Stelfox, Todmorden; B. C. Hill, Bristol; E. B. Crossley, Sherwood, Nottingham; D. M. Adlis, Edinburgh; W. J. Brough, Finsbury Park, N.; W. W. J. Calthrop, Farncombe, Surrey; H.

Carnley, Barnsley; W. T. Clarke, Liverpool; J. O. Cook, Plumstead, S.E.; B. R. Gribbon, Leeds; R. F. Gutteridge, Southampton; A. H. Hasnup, Hastings; C. J. Hazard, Stoke Newington, N.; S. T. Hennell, Wandsworth Common; H. D. Hird, Halifax; E. A. Jackson, Wood Green, N.; N. Jones, Southport; J. N. Keesley, Meadvale, Redhill; W. P. Langman, Notting Hill, W.; T. S. Lello, Goodmayes, Essex; P. Minor, West Didsbury, A. Purgess, St. Helen's, Lancs; W. C. B. Sinclair, Lynton, Bexley, Kent; B. C. Westwick, Mansfield, Notts.

The Final and Special Examinations, qualifying for candidature as Associate R.I.B.A., were held in London from June 24 to July 30. Of the sixty-seven candidates admitted, thirty-two passed, and thirty-five were relegated in certain subjects. The following are the names of the passed candidates, the † prefixed to a name signifying that the candidate passed the Special Examination designed for candidates exempted by resolution of the Council from the Preliminary and Intermediate Examinations and from submitting testimonies of study:

E. G. Allen, Croydon; †R. J. Allison, Honor Oak-park, S.E.; W. H. Bagot, Portland-place, W.; W. J. Ball, Warrington; E. Bates, East Croydon; C. Batley, Little Roundwood, Ipswich; W. E. Brown, Camberwell, S.E.; A. N. Campbell, Hampton-on-Thames; C. M. Childs, London; B. C. Chilwell, Wednesbury; C. B. Cleveland, Earl's Court-gardens, S.W.; †J. C. Cook, Cape Town, South Africa; N. Culley, Hudersfield; †S. C. Curtis, London; W. T. Curtis, West Dulwich, S.E.; W. J. Davies, Sidcup; A. H. Gloyne, Richmond, Surrey; H. P. Gordon, Harrow-on-the-Hill; P. W. Hawkins, Beckenham; B. B. Hooper, Brixton, S.W.; K. D. Robinson, Westminster, S.W.; G. A. Ross, Montreal, Canada; T. T. Sawday, Leicester; A. Scott, Jun., Dennistown, Glasgow; N. O. Searle, Paternoster House, E.C.; R. E. Stewardson, Upper Tooting, S.W.; F. E. Stratton, Figgs Marsh, Upper Mitcham; P. J. Westwood, Haymarket, S.W.; G. H. Widdows, Derby; F. Wilson, Sheffield.

The following shows the number of failures in each subject of the final:—

I. Design	20
II. Mouldings, etc.	33
III. Materials	20
IV. Sanitation	14
V. Specifications	17
VI. Construction: Foundations, Walls, etc.	9
VII. Construction: Iron and Steel, etc.	22

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Mr. J. Williams Benn, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 2,030*l.* and 1,237*l.* for housing purposes; Poplar Borough Council 13,340*l.* for sewer works, and 25,000*l.* for electric light installation; Stepney Borough Council 1,715*l.* for housing purposes; and the Guardians of St. George's Union 8,500*l.* for Poor Law purposes. Sanction was also given to borrowing the following sums:—4,500*l.* for paving works for Woolwich Borough Council; 15,636*l.* for electric light installation for Islington Borough Council; 18,500*l.* for street improvement, Kensington Royal Borough Council; and 234*l.* for housing purposes, Shoreditch Borough Council.

Engineering Jobbing Works.—The General Purposes Committee reported as follows:—"On May 5, 1903, the Council decided that the revised schedule of prices for engineering jobbing works, adopted on July 16, 1901, should continue in force until September 30, 1903. The engineer and the manager of works agreed after consultation that the schedule should remain in force until March 31, 1904, and that on and after April 1, 1904, a revised schedule to be prepared by them should be adopted. The Works Committee now inform us that a careful consideration of all the items for altered work, which have been modified and measured in many cases. An arrangement has been made whereby the items representing day-work have been eliminated and provision made for the actual cost of labour and materials only to be certified for, with an allowance of 15 per cent. to cover charges and to represent con-

tractor's profit, in accordance with the practice that generally prevails for work executed in this manner. We recommend:—(a) That the course taken in continuing until March 31, 1904, the revised schedule for engineering jobbing works adopted by the Council on July 16, 1901, be approved. (b) That the revised schedule for engineering jobbing works submitted to and approved by the General Purposes Committee on July 11, 1904, be adopted as from April 1, 1904.

The recommendations were agreed to. *Paris International Exhibition.*—The same Committee also reported:—“We report the receipt of a letter, dated June 30, 1904, from the General Administrator of the International Exhibition held in Paris in 1903, forwarding diploma awarded to the Council for its exhibits of photographs and drawings of working-class dwellings. The Architect of the Council has been awarded a similar diploma.”

Schools.—The Education Committee recommended, and it was agreed, that the clerk of the Council be authorised to sign on behalf of the Council the contracts with the undermentioned firms at the amounts of their respective tenders for carrying out the following works:—

Electoral Division.	Name of School.	Contractor and Amount of Tender.	Description of Work included in Plans.
<i>New Schools:</i> Lewisham	Gordonbrook-street	Mr. W. Downs, £22,363	Three separate one-story buildings providing accommodation for 999 children, also cookery and laundry centre.
Rotherhithe	Magdalen-street	Messrs. Spencer, Santos, & Co., Ltd.	One-story school for 372 junior mixed and infants (to take the place of the existing school).
<i>Enlargement, etc.:</i> Lewisham	Sydenham Hill-road	Messrs. J. & C. Bowyer, £10,357	Net addition of 94 places, new halls (boys' and girls' departments), combined cookery and laundry centre, enclosing, etc., additional land.
<i>Improvements:</i> N. Hackney	High-street, Stoke Newington	Messrs. J. Chessum & Sons, £5,133	New halls for all departments, redividing, restrepping, and relighting existing classrooms in each department, etc.
Haggerston	Shap-street	Messrs. J. Chessum & Sons, £11,651	Halls for all departments, redividing, restrepping, and relighting existing classrooms, staircases, and cloak-rooms, lavatories, teachers' rooms, drawing class and science rooms, etc.

That application be made to the Board of Education for approval to the finished plans of the following special schools, centres, etc.:—

Electoral Division.	Name of School.	Names of Contractors.	Description of Work included in Plans.
Battersea	Basnett-road	On schedule of Messrs. Garrett & Son, contractors, for the physically defective school. Estimate, £3,852	Separate school for 40 older men ally defective boys, together with a manual room; and also a manual training centre for 30 boys.
Chelsea	Middle-row	On schedule of Mr. E. Triggs, for junior mixed school. Estimate, £947	Manual training centre for 40 boys.
Wandsworth	Ensham-street	On schedule of Messrs. Lorden & Son, contractors, for new school. Estimate, £473	Enlargement of manual training centre so as to accommodate 40 boys.
Lewisham	Plassy-road	On schedule of Messrs. J. & C. Bowyer. Estimate, £533	Enlargement of mentally defective school by one classroom for 20.

Science and Drawing Classrooms.—A report was submitted stating that the Committee had had under consideration the question of the provision of science and drawing classrooms in ordinary public elementary London County Council schools, together with a suggestion of the Board of Education that the Council should consider whether science-rooms and drawing classrooms should form part of the equipment of a public elementary school. The Committee recommended that the Board of Education be informed that the Council considered the provision of such rooms to be necessary for the educational efficiency of public elementary schools.

Mr. Leon moved that the report be referred back. He doubted the necessity for every school having such rooms.

Mr. Thompson seconded the amendment, and said that in half the schools in London they had not got these special science-rooms, and if they passed the resolution they might be called upon to provide the accommodation.

Mr. Graham Wallis pointed out that the Board of Education had hung up several plans pending the decision of the Council as to whether they considered the provision of such rooms desirable.

The amendment was defeated and the recommendation carried.

Proposed Woolwich Tunnel.—The Bridges Committee again brought up a recommenda-

tion to the effect that the Standing Orders should be suspended to enable the Council to take the necessary steps for promoting legislation in the next session for powers to construct a footway tunnel to connect North and South Woolwich. The estimated cost of the tunnel was 145,000*l.*, the annual charge for interest and repayment on the outlay being 7,530*l.*, and the annual cost of maintenance 2,500*l.*

Mr. Torrance, in speaking against the scheme, urged that the proposal should not be considered until the boroughs of West Ham and East Ham promised to make a substantial contribution towards the cost.

After some discussion, the Council decided, on a division, not to suspend the standing orders by 71 votes to 39.

The scheme, therefore, fell through.

Tramway Receipts.—Mr. Allen Baker, the Chairman of the Highways Committee, in reply to Mr. Hubbard, stated that to realise the committee's estimates of receipts from the electric trams they would require an addition to the income of last year of 66,788*l.* Of that sum in the last three and a half months they had received 32,170*l.* That looked hopeful

Arbitration: Tottenham Court-road at Bozier's court.—The Improvements Committee reported as follows:—“We have to report that Mr. B. T'Anson Breach, the surveyor appointed by the Local Government Board to make the award upon the final assessment of the property upon which the Council has power to levy an improvement charge in connexion with the widening of Tottenham Court-road at Bozier's court, has now issued his award. The premises affected are the houses, shops, etc., Nos. 1A and 2 to 5, Tottenham Court-road, Tottenham-chambers, No. 4, Oxford-street, and the entrance to the Oxford Music Hall, Tottenham Court-road. The award determines that the value of all the property in question is substantially and permanently increased by the improvement, and that the enhanced value, after making all fair and proper deductions for rates, taxes, assessment, and impositions on the lands according to such increased value, is 18,996*l.* The Council is entitled to a payment from the owners of the property at the rate of 3 per cent. per annum upon one-half of this sum, which amounts to a charge of 285*l.* 10*s.* per annum. The owners have the right to redeem the charge upon payment of a sum equal to thirty-three times the amount of the charge. We have given instructions for the necessary steps to be taken to give effect to the award, and we report the facts for the information of the Council.”

Cardinal Wolsey's Palace.—Mr. Piggott inquired of the Chairman of the Local Government Committee whether anything was likely to be done with regard to Wolsey's Palace, otherwise known as the “Barber's Shop,” in Fleet-street, and when it was likely that the public would be permitted to see the ceiling. The existing state of the building was a disgrace, and he did not think there was anything like it elsewhere in the City.

Mr. Johnson, in reply, said unfortunately a dispute had arisen between the City Corporation and the Benchers of the Middle Temple. The sub-soil rights were claimed by the Corporation, and that claim was disputed by the Benchers. He regretted to say that he could hold out no hope of any immediate settlement of the dispute.

New City Fire Station.—On the recommendation of the Fire Brigade Committee it was decided that during the summer recess the solicitor should serve notices to treat for the acquisition of the remaining interests of four houses in Cannon-street and Queen Victoria-street, the site selected for the building of a new City Fire Station, in substitution of the Watling-street station.

Churches and Paving Charges.—The Local Government Committee brought up a report on the subject of securing an amendment of the law so as to remove the anomaly which arises from the fact that whereas places of worship of the Established Church are exempt from contributing towards the cost of paving new streets on which they abut, Nonconformist places of worship are liable to contribute in the same way as other property.

After a short discussion it was decided that the Local Government Board should be approached with the object of obtaining such amendment of the law as will make places of worship now exempt from such charges subject to them.

George Eliot's House.—The Local Government Committee recommended that in connexion with the work of indicating houses of historic interest in London the residence of George Eliot at Holly Lodge, Wimbledon Park-road, Wandsworth, should be commemorated by a memorial tablet. The facts connected with the house have been verified, and the necessary consent obtained to the fixing of the tablet.

The recommendation was adopted.

The Building Act Committee reported as follows, the recommendation being agreed to:—

District Surveyor for St. James, Westminster.—“We regret to have to report that the health of Professor Robert Kerr, District Surveyor for St. James, Westminster, is such as to incapacitate him from attending to any business. Professor Kerr is eighty-one years of age, and has been district surveyor for forty-two years, during the last twenty-one months of which it has been necessary to appoint a deputy district surveyor, owing to Professor Kerr being too ill to discharge the duties of the office. Professor Kerr's duties as district surveyor have always been performed to the satisfaction of the Council, but his health has now completely broken down. In the circumstances, and as it is impossible for Professor Kerr to tender his resignation of the office of district

surveyor owing to his being too ill to write, there is no alternative but for us to ask the Council to terminate the appointment. We have extended the appointment of Mr. H. N. Kerr, who has been acting as deputy district surveyor since November 9, 1902, until November 9, 1904, and we recommend that the appointment of Professor Robert Kerr, as district surveyor for St. James, Westminster, be terminated as from November 9, 1904."

Proposed Erection of a Shelter at the Cadogan Hotel, Sloane-street.—They also recommended, and it was agreed, that Messrs. Maple and Company, Limited, be informed that the Council is not prepared to favourably consider any application for consent to the erection of a shelter upon the Sloane-street frontage of the Cadogan Hotel, Sloane-street.

The Council soon after adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Brixton.—Dwelling-houses with bay-windows and porches on the eastern and western sides of Athelford-street and northern side of Landor-road, Brixton (Mr. W. P. Goosey).—Consent.

Hammersmith.—A one-story shop on the forecourt of No. 230, Uxbridge-road, Hammersmith (Messrs. Macintosh and Newman for Mr. G. E. Jones).—Consent.

Holborn.—The erection of the Council's Central School of Arts and Crafts and London Day Training College upon a site abutting upon Southampton-row, Orange-street, and Fisher-street (Mr. P. N. Ginham for the Education Committee of the Council).—Consent.

Islington, North.—Two houses upon a site abutting upon the northern side of Anson-road and eastern side of Dalmeny-road, Islington (Mr. A. D. Watson for Lieut.-Colonel E. Tufnell, M.P.).—Consent.

Kensington, North.—A porch at the Congregational church on the south side of Lancaster-road, Kensington, eastward of Basing-road (Mr. W. Theobalds).—Consent.

Kensington, North.—An iron and glass covered way in front of No. 2, Pembroke-square, Kensington (Mr. G. N. Watts for Mr. E. Jacobs).—Consent.

Kensington, South.—An iron and glass covered way in front of No. 43, Phillimore-gardens, Kensington (Messrs. A. E. Hughes and Son for Mr. H. E. Walters).—Consent.

Hackney, Central.—An oriel window at No. 222, Mare-street, Hackney (Messrs. Holman and Goodham for the Royal London Friendly Society).—Consent.

St. Pancras, East.—Balconies and an external staircase at the eastern end of the Midland Grand Hotel, St. Pancras (Mr. C. Trubshaw for the Midland Railway Company).—Consent.

St. Pancras.—An external staircase at the south-western end of the Midland Grand Hotel, St. Pancras (Mr. C. Trubshaw for the Midland Railway Company).—Refused.

Brixton.—A projecting show case in front of the railway abutment between Nos. 456 and 462, Brixton-road, Brixton (Mrs. J. May for Mr. A. G. Clark, trading as J. Dent).—Refused.

Islington, West.—Buildings upon the site of Loraine-place, Holloway-road, Islington (Messrs. Burne and Wykes for Sir John Dickson Poynder).—Refused.

Wandsworth.—Fifteen houses with bay-windows on the east side of Mayford-road, Wandsworth-common, northward of Ravenslea-road, Wandsworth (Mr. H. Bignold for Mr. W. E. Korven).—Refused.

Islington, East.—A warehouse building at the rear of No. 32, Newington-green, Islington, to abut upon Mathias-road (Mr. J. H. Storrar for Mr. C. Fell).—Refused.

Islington, North.—A building abutting upon Windermere-road, Holloway-road, Islington (Mr. J. W. Stevens for Messrs. Knowlman Brothers).—Refused.

Width of Way.

Finsbury, East.—Buildings on the site of Nos. 3, 5, 7, 9, and 11, Westmoreland-place, City-road, Shoreditch, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. E. Hasehurst for Messrs. Perry Brothers).—Consent.

Rotherhithe.—A two-story dwelling-house on the site of No. 3, Cornick-street, Southwark-park-road, Rotherhithe, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. W. J. Dixon).—Consent.

Rotherhithe.—That the application of Messrs. F. Chambers and Son for an extension of the periods within which the erection of a one-story building on the north side of Gibbon's-rents, Bermondsey, was required to be commenced and completed, be granted.—Agreed.

Woolwich.—A building at the Woolwich cemetery, King's-highway, Plumstead-common, with the forecourt fence at less than the prescribed distance from the centre of the roadway of King's-highway (Mr. F. Sumner for the Council of the Metropolitan Borough of Woolwich).—Consent.

Lines of Frontage and Construction.

Lewisham.—A building on a site on the northern side of Ravensbourne-park and western side of Catford Bridge, Lewisham (Messrs. Hatch and Hatch).—Consent.

Lewisham.—The retention of a wood and iron building at the rear of No. 39, Silvermere-road, Catford, abutting upon Holbeach-road (Mr. W. G. Robson).—Refused.

Islington, North.—Additions and the carrying out of alterations to a wood and iron chapel of a temporary character on the west side of Horsey-road, Islington (Mr. A. Goodchild for the representatives of the Horsey-road Baptist Chapel).—Consent.

Width of Way and Line of Frontage.

Chelsea.—A cloak-room addition to No. 125, Sloane-street, Chelsea, to abut upon Cadogan-terrace (Mr. R. G. Hammond for Mr. F. C. B. Clark).—Consent.

Hackney, North.—A cellar under the forecourt of "Grafton House," Church-street, Stoke Newington (Mr. H. Kennington for Mr. A. Benning).—Consent.

Lewisham.—Three houses, with one-story shops in front, upon the site of No. 63, Dartmouth-road, Forest-hill, Lewisham, with the external walls of the southernmost building at less than the prescribed distance from the centre of the roadway of Dartmouth-place (Mr. E. C. Christmas).—Refused.

Width of Way and Space at Rear.

Whitechapel.—A building next No. 3, Alie-place, Whitechapel (Messrs. J. Hood and Sons for Mr. M. Specterman).—Consent.

Woolwich.—Two houses on the eastern side of Graydon-street, Plumstead-common-road, Woolwich (Mr. C. H. Bidge).—Refused.

Formation of Streets.

Hammersmith.—That an order be issued to Mr. W. J. Ingram sanctioning the formation or laying out of new streets for carriage traffic in continuation of Heath-place, Uxbridge-road, Hammersmith (for Messrs. Griggs Brothers).—Consent.

Lewisham.—That the time within which the new street, to be named Bourneville-road, out of the east side of Ravensbourne-park, Catford, was required to be defined throughout by posts and rails, and thrown open to the public as a highway, be extended to three years from January 21, 1902.—Agreed.

Deviation from Certified Plans.

Brixton.—Deviations from the plan certified by the District Surveyor, under sections 13 and 43 of the Act, so far as relates to the proposed re-building of Nos. 44 and 46, Robarts-street, Brixton, abutting also upon Ingelborough-street (Mr. H. Bignold for Mr. W. Slade).—Consent.

Strand.—Deviations from the plans certified by the District Surveyor, under section 43 of the Act, so far as relates to the proposed re-building of Nos. 118 and 120, Wardour-street, Strand (Mr. W. Woodward for Mr. J. Newell).—Consent.

Height of Buildings.

Holborn.—Buildings on the eastern side of Kean-street, Burry-lane, Holborn, Catford, was required to be defined throughout by posts and rails, and thrown open to the public as a highway, be extended to three years from January 21, 1902.—Agreed.

Buildings for the Supply of Electricity.
Bow and Bromley.—A temporary annexe to the engine-room of the electricity generating station on a site at the corner of Glaucois-street and Yeo-street, Bromley (Mr. P. N. Hooper for Poplar Borough Council).—Consent.

Alteration to Buildings.

Battersea.—Alterations to premises on the north side of Green-lane, Battersea (Mr. F. Bannister for the Committee of the Battersea Liberal Club).—Refused.

Hackney, South.—An addition at the rear of "Nursery House," Millfields-road (Mr. G. W. Evles for Mr. G. Porter).—Refused.

Means of Escape at Top of High Buildings.

Kensington, South.—A deviation from the plans approved in respect of the means of escape in case of fire proposed to be provided in pursuance of section 55 of the Act, on the fifth and sixth floors of a building in course of erection on the north side of High-street, Kensington, at the corner of Brown's-buildings, so far as relates to the formation, at the ground level, of three window openings,

measuring 4 ft. by 3 ft. 3 in. each, in the wall separating the shop from the passage leading from the foot of the escape staircase to Clarence-mews (Mr. P. E. Pilditch).—Consent.

The recommendations marked + are contrary to the views of the local authority.

OLD EDINBURGH: THE SECRET OF ITS CHARM.

On the 13th inst. Professor Baldwin Brown delivered at St. Cuthbert's Hall, Edinburgh, a lecture on "Old Edinburgh; the Secret of its Charm, and How to Preserve it." He began by explaining that he did not intend to speak of the Edinburgh of world-famous monuments, such as the Castle or Holyrood or St. Giles', but rather of the Edinburgh of the smaller picturesque features, which singly were of minor importance, though in combination they imparted to the streets their special physiognomy. By these were meant the divisions and grouping of the masses of the older houses and their rugged masonry, the frequent gables, the dormer windows, with their carved finials, the timber projections, the rough stone slating, the harling, the moulded doorways and inscribed lintels, all of which helped to impart such a pleasant old-world aspect to the more ancient thoroughfares. The secret of the charm of Edinburgh resided partly in the natural features of the site, and partly in the general architecture, the treatment of the site, with the effective contrast between the classic regularity of the New Town and the picturesque confusion of the crowded and towering "lands" of the Old. It was the latter features that formed the main subject of the lecture. These older architectural relics, with the historical associations which gathered round them, were among the attractions of Edinburgh which intelligent strangers found of special interest. They were in this sense civic assets that had really a commercial as well as an artistic and historical value. Their preservation was, from all points of view, a matter of importance, for it must be remembered that they were a class of possessions which, when once destroyed, could never again be restored. The question how to deal with the older parts of the city, so as to retain as far as practicable its ancient charm, was one requiring serious attention. In all large towns there were improvement schemes in progress, and these were commonly preceded by wholesale clearances. In most towns the older property thus eliminated had no value, and was often already in a tumble-down condition. In Edinburgh, on the contrary, the older houses, dating from the XVth and XVIIIth centuries, were, as a general rule, solid stone structures, many of which might stand for centuries, and they possessed the artistic and historical value already referred to. For their preservation it was worth while taking a good deal of trouble, and even facing some immediate outlay, which, if Edinburgh retained all her attractions to visitors, would soon be repaid. It was a matter for congratulation that a policy of wise conservation was now in the ascendant in that department of municipal government which had this matter in charge. The old "lands" might have to be gutted and their interior spaces redistributed, but the matter of importance for the charm of Old Edinburgh was the judicious reparation and preservation of the external fabric. Some excellent instances of the carrying out of this policy would be afterwards shown on the screen. It might be hoped that this would be the established policy for the future, both on the part of the city and on the part of corporate bodies and private individuals who were holders of property in the older parts of the town. Whether or not the civic authorities should be armed with certain powers in respect to private property of artistic and historical value was a further question on which it was not possible then to enter. Abroad, in old cities of the class of Edinburgh, such powers were being sought and acquired, and though in Great Britain there was at the moment nothing of the kind, Edinburgh might well take the lead, as she had done on previous occasions, in making the needed application to Parliament. They were fortunate indeed who yielded to no one in his affection for his native town, and who was sincerely anxious that she should continue to attract from all parts of the world the lovers of beauty and romance, both in nature and art. They were really now at the parting of the ways. Enough remained of the ancient heritage of the town to make the term "Old Edinburgh" still a word to conjure with, but if much more were allowed needlessly to perish, the town was in danger of becoming hopelessly modernised. The matter was ultimately in the hands of the citizens at large, and it was for them to determine how

best to deal with the heritage that had descended to them from the past. He was not a fanatic on the subject of preservation; all they wanted was that they should preserve everything that could possibly and reasonably be preserved.

There were then thrown upon the screen a number of photographs illustrating both the grander and the more homely features of the older Edinburgh architecture, and, in conclusion, it was pointed out that, though more than eighty views had been shown, no one of the more famous monuments of the city had been included in the survey. The minor or secondary features of Old Edinburgh had proved sufficient in themselves to fill the time allotted. This gave an idea of the richness of interest which the city was able to provide.

Scotsman.

WESTMINSTER CITY COUNCIL.

The usual fortnightly meeting of the Westminster City Council was held on Thursday last week at the City Hall, Charing Cross-road.

Piccadilly Improvement.—The Mayor called attention to an error in the return of votes recorded in a division on a report of the Improvement Committee dealing with the widening of Piccadilly between St. James's street and Duke-street. The motion before the last meeting was that the Council should agree to give a sum, not exceeding 8,000Z., towards the improvement. From the counting it appeared that the matter was referred back, but this was wrong. The Mayor put the resolution again to the meeting, and it was carried.

Louisa. It was agreed to make application to the London County Council to borrow 1,146Z. for sewer works in Bond-street, Park-lane, Regent-street, and Trafalgar-square.

Gift of Pictures.—On the recommendation of the General Purposes Committee, it was agreed to accept four prints of Westminster views, and an etching of the old bridge, Putney, the gift of Coun. illor Burch.

Improved Lighting of Parliament-square.—It was decided to enter into an arrangement with the Gas Light and Coke Company for the erection and maintenance of eight lamps in Parliament-square, on the same terms and conditions as attach to the contract recently entered into by them for the lighting of Aldwych. The globular lamps, in clusters of five, on the railings of the enclosed gardens in the centre of the square, will not be affected by the proposed arrangement.

Sewers.—Sanction was given to the City Engineer to renew part of the Kinnerton-street sewer. The Works Committee submitted a report dealing with the question of the proposed construction of a new sewer along Ruidland-street, and it was agreed to authorise such sewer, subject to the London County Council agreeing to leave the question as to who is liable to bear the cost to be settled hereafter. Further, it was resolved that the County Council be invited to agree to state a case to the City Council, for submission to the High Court for their decision, whether the City Council or the County Council are liable to bear the cost of constructing the sewer. The engineer's estimate of the cost of the sewer is 2,600Z.

Wood Paving.—The Works Committee reported having come to the decision that the work of repairing the wood carriageways of Chancery-lane, Sackville-street, Shaftesbury-avenue, Wardour-street, and Hobart-place could be more economically executed under contract than by the Council's own staff, and having had tenders from Messrs. W. Griffiths and Co., the Improved Wood Pavement Company, and Messrs. Mowlem before them, recommended that the offer of the Improved Wood Pavement Company be accepted. This was agreed to.

Closing of Thoroughfares.—On condition that Mr. C. E. Mallow gives a portion of land in Vardon-street to enable that thoroughfare to be widened, it was agreed to allow Horse-shoe-alley to be stopped up. It was also decided to allow Messrs. Hampton and Sons, Ltd., to close Monmouth-court, Whitcomb-street, on their agreeing to pay 50 guineas, and in future to treat the sewer in the court as a private drain.

Widening of Chandos-street.—The Improvements Committee again reported on the question of widening Chandos-street, in connexion with the Mayor's Building Improvement scheme.—The cost of widening Chandos-street in the north side from Bedfordbury to St. Martin's-lane, and the partial improvement of the two latter thoroughfares, is estimated by the Valuation Surveyor at 187,000Z., while the cost of widening this thoroughfare from No. 40 eastwards as far as Bedfordbury, is estimated at 73,000Z., which latter estimate is considered might be reduced to 60,000Z. if the owners, etc., of the "Marquis of Granby" public-house would consent to be reinstated on part of No. 1, Bedfordbury (his estimate in-

cludes the value of the portion of No. 1, Bedfordbury, which would be so utilised). At the present moment the Committee were disposed to favour the adoption only of the proposal to widen from No. 40 eastwards to Bedfordbury, providing that the County Council would undertake the improvement, to which the City Council would contribute, and they were communicating with the County Council on this matter. Besides relieving the Strand and general traffic from east to west, and *vice versa*, the improvement would, it was anticipated, facilitate the heavy traffic to and from Covent Garden Market, and the Committee, accordingly, propose to communicate with the Trustees of the Bedford Estate for the purpose of ascertaining whether they will be disposed to contribute towards the cost of the proposed improvement. The report was received.

House-Breaking Operations.—On the recommendation of the Law and Parliamentary Committee, it was agreed that a communication be addressed to the London County Council suggesting that further powers are urgently needed for dealing with nuisances arising from the demolition of buildings in the metropolis, and asking them to include a provision in their next General Powers Bill for dealing with the question.

COURT OF COMMON COUNCIL.

The usual fortnightly Court of Common Council was held at the Cuildhall, E.C., on Thursday last week.

Street Improvements.—The Improvements and Finance Committee submitted a report dealing with the widening of Skinner-street and Mansell-street. It was agreed, on the recommendation of the Committee, to acquire premises at the eastern end of Skinner-street, for the purpose of the widening, for the sum of 6,150Z.

A recommendation that an arrangement be made for the removal of the buildings over the entrances at either end of Duke's Head-passage was referred back for further consideration.

It was agreed to pay the sum of 1,401Z. for the portion of the site of St. George's Church, Botolph-lane, needed to widen the public ways of Botolph-lane and George-lane, Billingsgate.

Illustrations.

SCULPTURE, MUNICIPAL BUILDINGS, CREWE.

THE illustration shows the sculpture executed by Mr. F. E. E. Schenck for the decoration of the new municipal buildings at Crewe, of which Mr. H. T. Hare is the architect.

The idea of the sculpture was to illustrate or symbolise the Industries of the County of Cheshire. The signification of each of the separate figures is given on the plate.

The panels, which are divided by large columns, are carved in Coxbench stone. The scale of the figures is 10 ft.

ST. BARTHOLOMEW'S HOSPITAL.—NEW OUTPATIENTS' DEPARTMENT.

This building will contain the casualty and outpatients' department, the special departments, the dispensary, the resident medical officers' quarters, etc.

It will have a frontage to Giltspur-street of about 144 ft., faced with stone, and designed to harmonise in style with the other buildings of the hospital.

The resident medical officers' quarters will be in the front, and in the rear of them will be the outpatients' waiting hall, 140 ft. long and 45 ft. wide, and capable of seating 850 people.

Surrounding this waiting hall there will be twenty rooms, to be used by the house physicians, house surgeons, and others who will attend to the casualty patients, a dental room, two operation-rooms, rooms for the sister, nurses, etc. Rooms will be provided for the reception of accident and other emergency cases.

A large dispensary will be provided at the south-east angle of the block, with separate entrances and exit for the patients.

On the first floor will be rooms for the treatment of medical and surgical outpatients; and on the second and third floors will be the throat, ophthalmic, aural, diseases of women, skin, dental, electrical, and orthopedic outpatients' departments.

On the fourth floor will be a clinical lecture theatre, and provision will be made in the basement for baths, isolation-rooms, etc.

The architect is Mr. E. B. Anson.

GRAMMAR SCHOOL, NEWCASTLE-ON-TYNE.

We give illustrations of the design by Messrs. Russell and Cooper, which has been selected for the new Royal Grammar School, at Newcastle-on-Tyne.

The following extracts from the report sent in with the drawings will explain the architects' intentions in the design:—

"The school is disposed on the site to insure as large and uninterrupted a playing area as possible. An alternative block plan is submitted showing the main school block placed south of the sewer (a, b) in case the Governors should not approve of the main building being placed hard to the boundary in Lambton-road. The school is planned in as compact a manner as possible with a minimum of corridor, the majority of the class-rooms having a southern aspect and the remainder facing east and west. The art-room is incorporated with the main school building, and has a north light. It is on the ground floor of the assembly hall, and is placed in this position so that it will be easily accessible for all the boys in the school. If placed in conjunction with the science school it would necessitate the youngest boys using that school for this purpose only.

The Changing Rooms, Lavatories, and Latrines.—The Changing Rooms, Lavatories, and Latrines are grouped together in two blocks for seniors and juniors external to the school, so that they may be accessible to the boys when the school itself is shut. The lockers are ranged round the changing-rooms in two tiers.

The Masters' Lavatories, &c., are arranged in connexion with the juniors' block, and a changing-room is provided for their use. Two shower-baths are provided in each changing-room.

Future Extensions.—The parts required for the completion of the school are planned in such a manner that they can be carried out without interfering with the working of the school, and when executed would preserve the balance of the scheme. It will be noted that the method of designing the extension leaves unimpaired the appearance of the part of the school to be executed at present when viewed from Lambton-road. To obtain access to the four future class-rooms in the main school, short corridors would be formed across the present locker-rooms, and these could be turned into cloak-rooms.

Design.—The buildings are designed in a simple manner with Renaissance feeling, carrying on the accepted traditional type of the English grammar school.

Materials and Construction.—The walls are to be carried up in brick, with selected red brick facings and Prudham stone dressings. The roofs to be covered with green slates on boarding and felt. All floors to be of fire-resisting construction, with wood block flooring in hall and class-rooms. The entrances, staircases, corridors, class-rooms, and latrines to have glazed brick dados. The joinery to be in yellow deal.

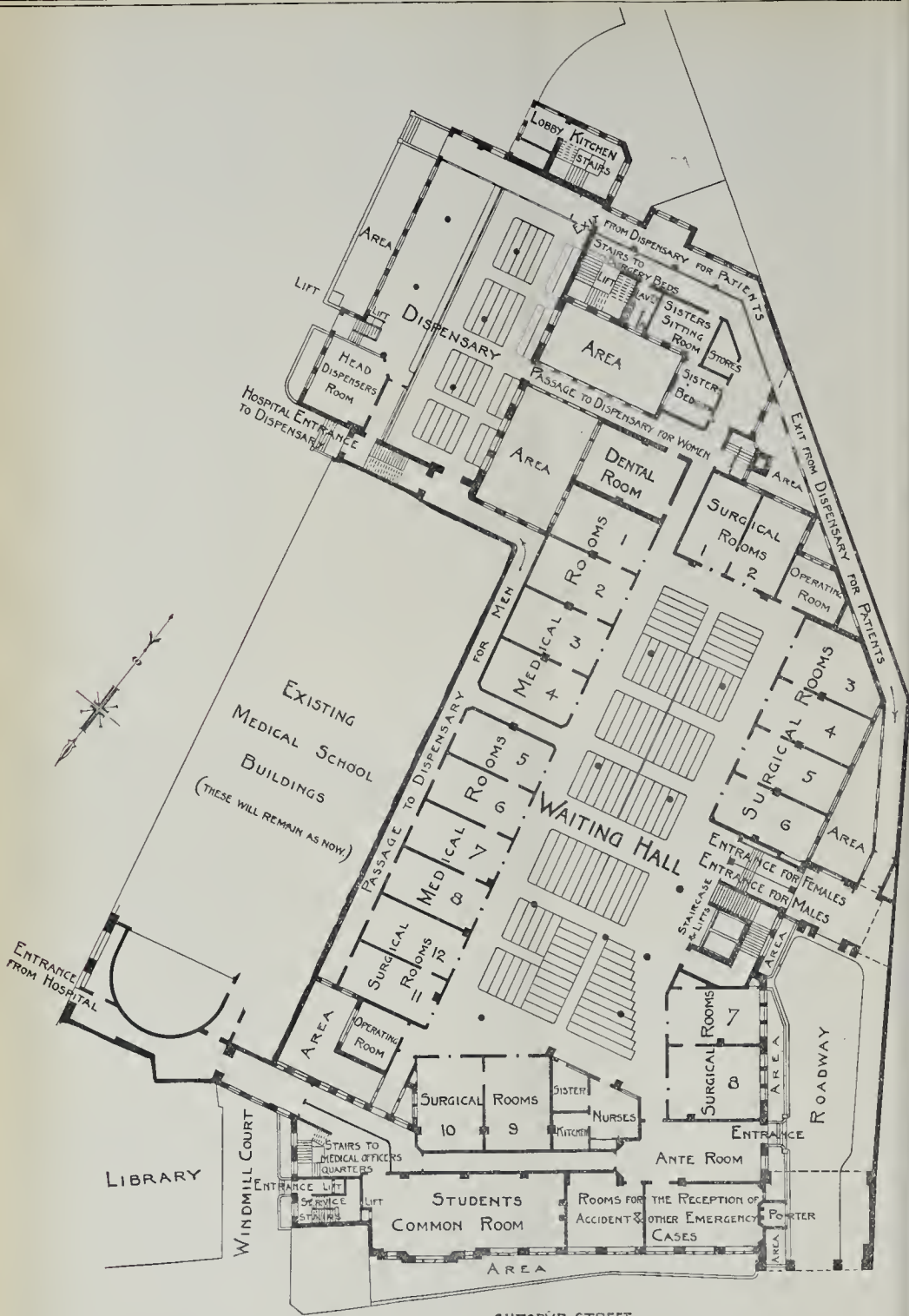
The heating to be carried out on the low-pressure hot water circulation system, with central boiler and cast-iron main, carried either way in subway under corridor and covered way. From these mains service pipes are to be carried to serve the radiators in class-rooms, gymnasium, changing-rooms, and lavatories.

The central hall to be heated by rows of cast-iron pipes underneath the lockers ranged round the walls. A row of pipes to be placed also along the front of galleries to counteract any down draught. Each radiator to be fitted with a proper ventilating base. Extraction flues with gratings, with silk flaps, fixed near the ceiling level to be carried up in the inside walls of the building and collected in the main duct over corridor, and the foul air to be discharged by means of electric fans. The fans and flues to be arranged to effect a change of air six times in the hour in each room. Extraction to be provided through each of the fume chambers in the chemical laboratory and to be connected to separate fan."

COMPETITIONS.

MUNICIPAL OFFICES, SMETHWICK.—In a recent competition for new municipal buildings for Smethwick, to be erected on a site adjoining the entrance of Victoria Park, plans were invited from five architects in the Midlands, and Mr. T. E. Colcutt, of London, was appointed assessor. A special meeting of the Town Council was held on the 11th inst., when it was found that the assessor recommended the acceptance of the No. 2 plans. The sealed envelopes were opened, and it was found that these were the plans of Mr. F. J. Gill, a local architect. The Mayor then proposed that the plans be accepted. Alderman Cheshire seconded, and the resolution was carried.

ETON WAR MEMORIAL COMPETITION.—The assessor, Mr. Norman Shaw, has awarded the premiums in this competition as follows:—First premium, Mr. L. K. Hall, 24, St. James's-street, S.W.; second premium, Mr. Francis Mount (Messrs. Eden and Mount), 3, Staple-inn,



GILTSVVR STREET

GROVND PLAN

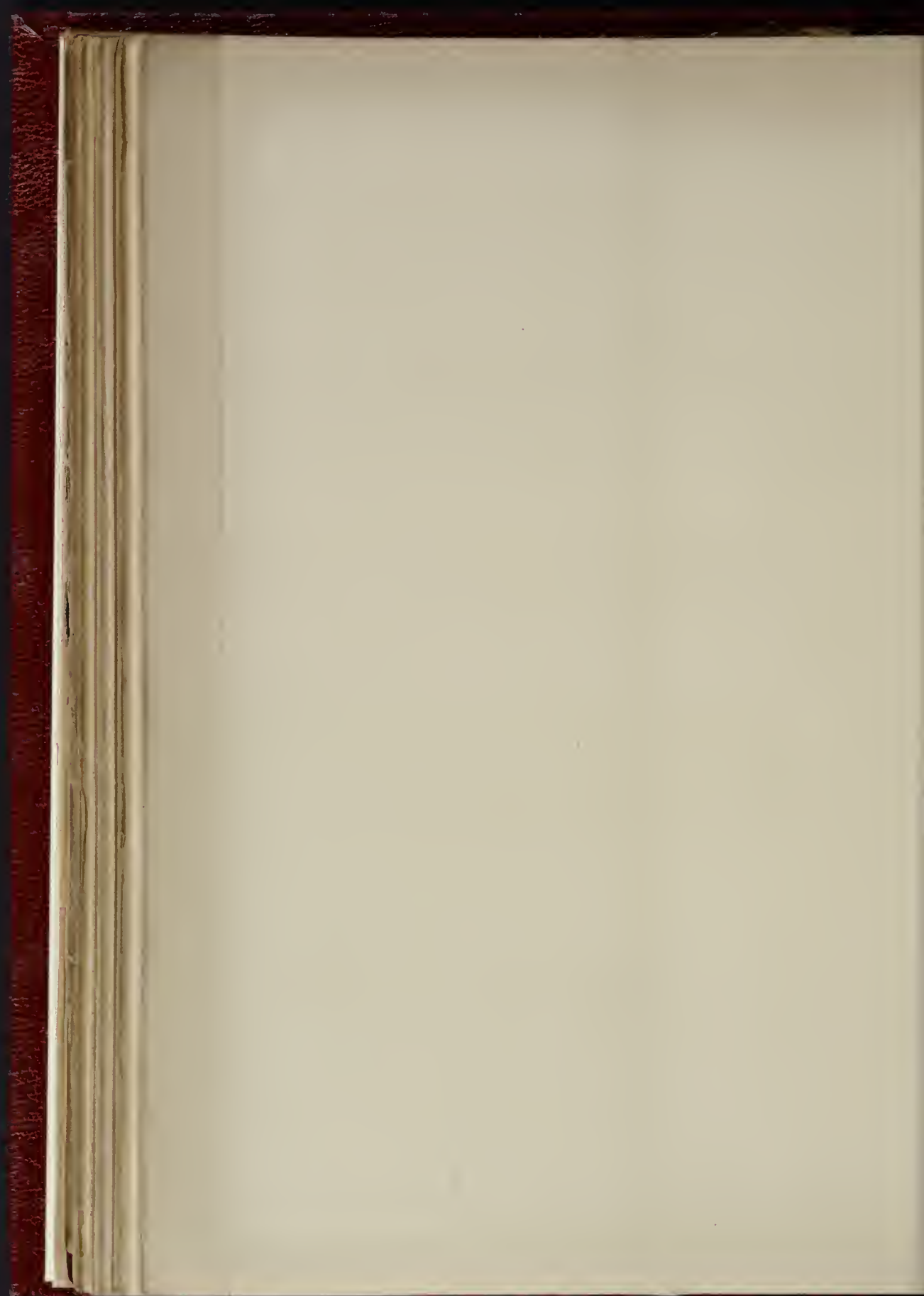
SCALE OF FEET 0 10 20 30 40 50 60 70 80 90 100 FEET

New Buildings, St. Bartholomew's Hospital. Plan (See page 95)



THE NEW ST. BARTHOLOMEW'S HOSPITAL.—MR. E. B. INESON, F.R.I.B.A., ARCHITECT.

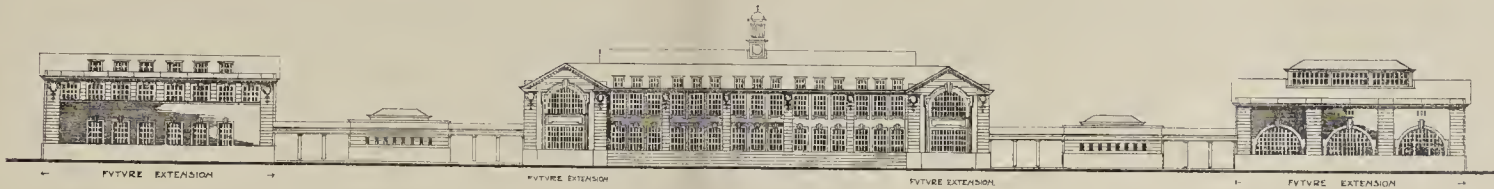
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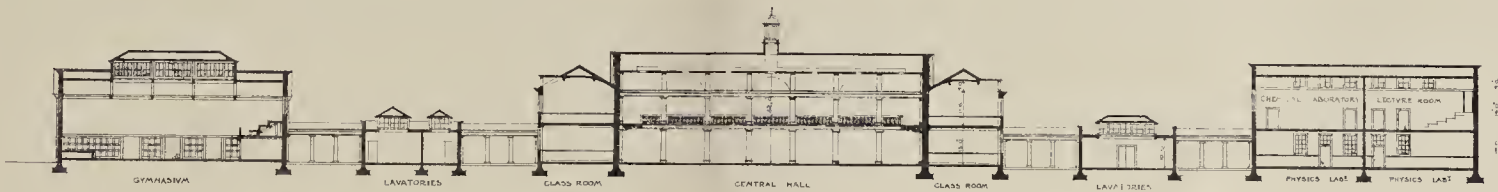
ROYAL GRAMMAR SCHOOL · NEWCASTLE ·



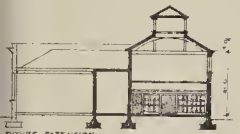
NORTH ELEVATION



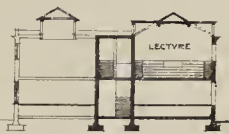
SOUTH ELEVATION



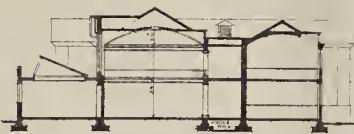
SECTION A-A



SECTION THRO' GYMNASIUM & DINING HALL.



SECTION THRO' SCIENCE SCHOOL.



SECTION B.B.



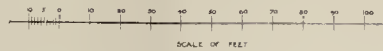
EAST ELEVATION OF SCHOOL BLOCK.



ELEVATION OF GYMNASIUM.



ELEVATION OF SCIENCE SCHOOL.



SCALE OF FEET

INK PHOTOGRAPHED BY J. H. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

Holborn; third premium, Mr. Amhrose Poynter, 28, Southampton-street, Bloomsbury-square. A note on the subject will be found on page 87.

LONG Eaton FREE LIBRARY.—Premiums of £25., £15., and £10. were offered in this competition for the best plans and designs, the competition being confined to architects residing in the town. There were five sets of plans sent in, and the awards were given as follows:—First, Messrs. German and Ross; second, Mr. Reginald Smith; third, Mr. W. H. Woods.

BOOKS RECEIVED.

SEA COAST EROSION AND REMEDIAL WORKS. By R. G. Allanson-Winn, M.Inst.C.E. (The St. Bride's Press. 1s.)

BAYEUX: ITS CATHEDRAL AND CHURCHES. By the Rev. R. S. Mylne. (Geo. Bell and Sons. 2s. 6d.)

THE PLANNING OF POOR LAW BUILDINGS AND MORTUARIES. By Albert C. Freeman, architect. (The St. Bride's Press. 7s. 6d.)

TRADE CATALOGUES.

THE Campbell Gas Engine Co., of Halifax, send us their catalogue of "Little Samson" oil engines and "Little Samson" pumping plants. Each type of machine is made in accordance with the standard methods of design and construction adopted by this firm, and the prices appear to be particularly reasonable for the duties quoted.

We have received from the Linolite Co., of Victoria-street, Westminster, a printed copy of a report on the photometry of linolite by Mr. J. S. Dow, of the Central Technical College. Very exhaustive photometric tests were made on this type of straight filament lamp both with and without reflectors. It was found that with a polished aluminium reflector the mean spherical candle-power was highest, a white enamelled reflector came next, and a nickelled copper reflector was a good deal worse than the others. The light thrown forwards over an angle of 70 deg. was practically double of the light that would have been obtained without a reflector. The reflector therefore seems to fulfil its functions in a very satisfactory manner. The report says nothing about the efficiency or the life of these novel lamps.

We have received from the Edison and Swan Electric Light Co. Limited, of Queen-street, London, Section X. of their catalogue. All kinds of telephones and their accessories are described in this section. The private house telephones, called "parlyphones" in this catalogue, deserve to be more widely known. They can be attached at once to an ordinary electric bell circuit, and no extra wires or batteries are required when it is only necessary to ring up from one end. When it is desired to be able to make calls from either end an electric bell mounted on a wooden box containing a dry cell is also provided. Numerous standard forms of magneto-telephones, etc., constructed according to stringent specifications, are described and illustrated. The automatic inter-communication telephones should prove useful in large warehouses.

From Messrs. J. M. Henderson and Co., of Aberdeen we have received a catalogue of patent compensating derrick cranes, including particulars of the Mitchell-Williams rapid luffing gear. Some of the various advantages claimed for this patent gear are that the load is kept perfectly level while the jib is being luffed; that the jib will remain at any angle, with or without the load, without brakes or locking gear; and that the power required for luffing, which it is claimed is from one-fourth to one-tenth of that usually required, is the same for all loads. This gear should be very useful in loading and unloading contractor's materials, and especially in securing the rapid handling of goods in confined spaces.

Messrs. John Mullin and Co. (West Bromwich) have sent us a specimen piece of their fire-resisting curtain material for theatres, called the "Ajax Uralite Fireproof Curtain." With it is enclosed a note from Mr. A. R. Tozer, chief officer of the Birmingham Fire Brigade, to the effect that a piece of this curtain was subjected for three minutes to the flame of a brazier's blow-pipe, at a heat sufficient to melt brass in 45 seconds, and that the result was "most satisfactory." The framework of the curtain is of 2 in. angle iron, with stiffening pieces across the centre in each way. The whole area of the curtain is covered with thin layers of uralite, so arranged that all joints are broken in bond, and firmly riveted together. In

addition to this, each sheet, 6 ft. by 3 ft., is, when ready for fixing in position, thickly coated with a special composition which makes them adhere together, so that when completed and allowed to set hard the whole fabric is as one sheet of uralite, $\frac{3}{4}$ in. thick, stiffened by steel framework. The curtain is raised by the agency of a small electric motor, and rises as soon as the current is switched on. It is lowered by raising a lever which can be worked from the flies, or the stage, or any other point within 100 yds.

The Saxon Portland Cement Co., of Cambridge, have sent us a pamphlet giving an account of their process of making cement, together with a short description of their works. The book contains useful data relative to cement tests generally, as well as to tests made by various experts on the Saxon cement. The average results of tests made at the County Laboratory, Cambridge, shows the main characteristics of the Saxon brand cement to be as follows:—Tensile strength, four days, 400 lb. per sq. in.; tensile strength, seven days, 620 lb. per sq. in.; tensile strength, twenty-eight days, 780 lb. per sq. in.; fineness, 3 per cent. residue, 75 by 75 sieve; sp. gravity, 3.14; steam test, thoroughly sound; contraction or expansion, nil.

The Abner Doble Company, of San Francisco, send us their catalogue containing particulars of the Dohle tangential ellipsoidal water-wheels, and of the various parts used in their construction. One illustration shows a water-wheel of this type, 10 ft. 5 in. diameter, and weighing over 10,000 lbs. Under 1,531 ft. head, two wheels of this size are driving two 2,000 kw. generators at the de Sable Power House of the California Gas and Electric Corporation. Illustrations and brief descriptions are also given of a 1,300 horse-power Doble wheel at the works of the Edison Electric Company, Los Angeles, as well as of the wheel buckets, needle regulating nozzles, housing, bearings, and small water motors for laboratory and other purposes.

Messrs. J. Sagar and Co., of Halifax, send us an eight-page illustrated descriptive of their surface planing, thickening, and moulding machine, with hand or roller feed. Several sizes of this machine are illustrated, and the chief details are fully described, as well as the safety guard made by the same firm.

We have received from the General Electric Company, of Queen Victoria-street, London, the ninth edition of their telephone catalogue. It is thoroughly up to date, and many novelties are illustrated and described. The loud-speaking navy telephones described are new to us, and appear to be well adapted for their purpose. Special telephones, suitable for rifle ranges, electric tramways, and fire-alarm systems, are listed, and we notice that slight alterations have been made in some of the older forms of apparatus. We were interested in the lightning protectors and arresters for telephone lines. Some of them are novel, and should prove effective. There are many things that are worth studying in this catalogue, and everyone interested in telephony should write for one.

The General Electric Company has also sent us the eleventh edition of their switch and fuse board catalogue, which contains also lists of the Robertson glow-lamps and of Nemst lamps. In addition to the usual electrical sundries, water-tight switches are illustrated, including the Admiralty pattern switches and distribution boxes. We have noticed that in some cases reductions in price have been made.

We have received from the Electric and Ordnance Accessories Co. Ltd., of the Stellite Works, Birmingham, a catalogue of the Stellite short-distance telephones and a leaflet entitled "A Short Treatise Telling How." The leaflet describes how it is possible to get better value from your electric-bell system by making it serve as a telephone system as well at a slight extra expense. For 15s. a pair of telephones, with suitable cords, switch, rosette, hanger and bell wire, are provided, which will enable anyone to speak directly from the dining-room to the kitchen. In the catalogue full descriptions are given of the Stellite telephones, and the methods of using them with existing electric bells are fully described.

LEYSIAN MISSION BUILDINGS, CITY-ROAD.—We omitted to mention in our brief description of this building last week that the terra-cotta work was by the Ruabon Coal and Coke Company, Ltd. (Dennis, Ruabon).

Correspondence.

TRAFALGAR-SQUARE AND REGENT-STREET.

STR.—With reference to the interesting articles which have appeared in your issues of 2nd January and 2nd July, I think that the enclosed letter from Mr. John Nash, which is a report or valuation on some premises in the line of the New Street, may be of interest to your readers. The valuation shows how much care was taken by the architect over a somewhat unimportant matter. The original letter, with others, is in my possession, bearing the date 1817; they are entirely written by the architect himself. The wonder is that he could have found time to enter so fully into details.

W. HILTON NASH.

"THE NEW STREET.
"29, Dover-street.
"27th Dec., 1817.

"DEAR SIR,—I am sure you will not be influenced by the rig-my-roll writing which Mr. Bull has laid before you; I shall therefore not annoy you with contravening his unfortunate statements, drawn from absurd arguments. I will now only send you my calculation of Ostler's claim. The others you shall have to-morrow. "You saw the wretched mansion in which he lives and of which he is more an inmate than a householder, not having an upright house from top to bottom. I am of opinion that the extreme value of the house is what he pays, 42l. It is well-known that Walker, his landlord, lets his premises at the extreme rent, but the building will speak for itself. He is out of this liable to repairs, and you will, of course, see what they would be if enforced. The house, therefore, as a house is worth nothing, or less than nothing; it is the situation, therefore, gives it a value, as a retail trade, and that situation is certainly of the best kind, but Walker, aware of that, has demanded 42l., which in other streets would not be worth 20l.

"I hope you are aware that because a house happens to fall in the line of the New Street, that it must necessarily be worth something; it may, however, be nothing more than the compensation a man ought to receive for the expense of getting another, and this is little more in the present case. Look at the man's stock of turnery. I will venture to say 100l. will clear his shop. As a turner he has, I daresay, fixed customers; besides this he carries on a very small carpenter's business; for this, too, he has fixed customers, and, go where he will, he can make boxes and put up a turning lathe. This concern is of the smallest kind, and in my original survey I had put this man's goodwill and moving at 70l. If he gets 100l. it will, I have no doubt, be more than he ever expected to be worth in his life, and, between man and man, I think he would be most liberally remunerated by 100l.

"To go into a minute calculation of this case is ridiculous, because there are no data to go by. The house, the situation, the man, his stock, and his circumstances should be looked upon from a judgment formed on the whole. Did the man ever realise 100l. in his whole living there? If he gets 100l. it would be clear gain. In a week you will find him in another similar dwelling, working as a box-maker and carpenter, and his wife selling toys or something else.

"Ever, dear sir, faithfully yours,
"JOHN NASH.
"JAMES FIELD, ESQUIRE."

JUMIEGES ABBEY.

STR.—The illustration and account of the *Abbaye de Jumieges* are delightful to read and examine by anyone who knows and loves the building itself. Two points of some interest might be worth adding for the benefit of those who contemplate a visit to the ruins:—(a) The interesting fragments in the gatehouse, especially a portion of the tomb of "Les Enervés"; (b) the, to me, unique treatment of many of the round arches, which have a central joint. There is also much to interest in the parish church here (as also at that of Yainville, *en route*), notably a bit of old glass supposed to have been brought here from the Chateau of Mesnil hard by, where Agnes Sorel died—its subject "Suzanne et les Vieillards," seems to justify the statement.

I fancy that, when capitals were decorated with conventional foliage in colour, it was the intention to leave it at that. Perhaps some learned writer would clear up so interesting a point. Great as was co-operation in old days, it is a doubtful point if the colour decoration man would like to pose as a mere provider of a pattern for the carver to cut away. Where means are limited (and they generally are just now) it would give a chance to adopt this treatment as a new *point de départ*.

E. SWINFEN HARRIS.

STAMFORD LIBRARY COMPETITION.

SIR.—Your issue of July 9 contained a paragraph relative to the Stamford Library Competition, stating that the time for sending in designs had been extended to July 30. Some months ago the Stamford authorities stated in your columns that the conditions of the competition would be sent in due course to any architect depositing 1*l.* 10*s.*, which I forthwith did, and, so far, have received no intimation beyond the receipt for my cheque, until, in your columns of the 9th, I saw that the designs had to be sent in by July 30. I thereupon wrote asking for the conditions, site, plan, etc. and again after a week's interval, to both of which letters I have received no reply.

T. R. BRIDSON.

CEMENT BRICKS.

SIR.—The great advantage of cement bricks is that they can be made anywhere, indoors as well as out-of-doors. They take no brick-yard space, require no brick-kiln, nor any great time to dry or to set, and when they are made they are as good as Woolpit bricks or any spurious imitation thereof. They could be made in a house in Cheapside or Fleet-street if it were not for the terrific rents required, and could be produced to order on a day's notice. Some indoor factories in East London could easily be established, where rents are comparatively low and employment greatly in demand.

WALTER SCARGILL.

CONSTRUCTION OF ICE-HOUSE.

SIR.—Could any of your readers kindly inform me of the cheapest and most efficient mode and construction of a building for the storage and preservation of shiploads of block ice. The building would be situated on a public street, in an exposed position, and would be about 100 ft. by 40 ft. by 9 ft. to the eaves. How should the wall be built, of what thickness, and material (if concrete, please state proportions), and should the roof be circular or flat, and how constructed?

Would vulcanite roofing or granolithic be of any use? I would also like the names of any firms who make this class of work a speciality, and also the number of cubic feet allowed for each ton of ice.

COLD STORAGE.

The Student's Column.

NOTES ON PORTLAND CEMENT: CHAPTER II. (cont. need).—THE ANALYSIS OF CEMENT MIXTURES.



Do make a good even cement the manufacturer must keep his mixture as near as possible to the same composition. When he has found what proportion of limestone or chalk and clay give the best results, his endeavour should be to keep the "mixing" as nearly as possible to that limit. For this purpose it must be tested at frequent intervals; half-hourly with variable material, or a few times a day when the mixture is not so variable. There are many quick methods of determining the composition of the "mixing," all of which, when carefully carried out, are valuable. When the test is done, say, three times daily, or if there is much lime present not in the state of carbonate, the total clayey matter may be determined. One gramme of the dried raw mixture is treated with 10 ccs. hydrochloric acid and 20 ccs. water, boiled for a few minutes and diluted to about 250 ccs. Ammonia is then added in very slight excess, which will precipitate the silica, iron, and alumina, along with the clay and sand. The precipitate is filtered, washed with hot water till free from chlorine, transferred to a platinum crucible, and ignited. The filtrate contains the lime, magnesia, sulphuric anhydride, etc., a complete separation of which should be occasionally done. There is always some of the lime in the ammonia precipitate, but, with experience in manipulation and care, this need not exceed 0.2 per cent., which is near enough for a practical test. When the test has to be made hourly, the method used must be much more expeditious.

The carbonate of lime may be treated with standard hydrate of lime as being used as indicator, but the end point is difficult to determine; or it may be decomposed with hydrochloric acid, estimating the loss in weight as carbonic acid (Mohr's

apparatus). In the author's opinion there is no more convenient method than by the calcimeter. This essentially consists of a graduated tube for measuring the carbonic acid gas evolved, from which the carbonate of lime is calculated. Fig. 1 is a sketch of an apparatus suitable for this purpose. The cylinder D contains ordinary water, the tubes A and B distilled water, so full that when the water in A stands at zero not more than about 5 ccs. are in B. The *modus operandi* is as follows:—The barometric pressure and the temperature of the water in D are noted. From this data the weight of substance required is obtained. A sample of the raw mixture is dried in an air oven, finely ground, and the necessary quantity weighed out sharply. This is put into the clean dry bottle C. A small tube containing 10 ccs. hydrochloric acid of 1.2 specific gravity is placed in the same bottle, which is connected to the tube A by a rubber tube E; the stopcock E is opened, and the water level brought to the zero mark in A. The stopcock is now closed, and the acid gradually tipped on to the substance, the bottle being well shaken to expel the carbonic acid

correction for absorption being added, the true percentage of carbonate of lime is obtained. Example.—Barometer = 740 mm.; temperature = 16° C. By reference to a table 0.807 grammes is found to be the weight required. The reading on the measuring tube is 72 and 2.7 is the correction for absorption, giving a percentage of 74.7 carbonate of lime. With slight variation in details all calcimeters are the same. The author's objection to them is that current of cold or hot air blowing on the measuring tube quickly effects the gas volume, so giving erroneous results, sometimes as much as x 3 per cent. To avoid this error a calcimeter was devised by the author. From sketch (fig. 2) it will be seen that the entire gas volume is surrounded by water which is not quickly effected by changes of temperature. The water in the measuring tube is also saturated with carbonic acid gas, as fresh water absorbs its own volume of this gas. The test is carried out in precisely the same way as already described, and can be completed in ten minutes from the time of procuring the sample. Tables of weights of substances to be taken and corrections for absorption are obtained with the calcimeters.

Coke and Coal (Proximate Valuation).

The other chief material used by the cement maker is the fuel to burn the raw mixture into clinker. If burned in the rotary kiln coal will be used, and the moisture, volatile matter, ash, and calorific power should be determined.

The calorific value is no criterion of the value of a coal for use in the rotary kiln without knowing the volatile matter, which should be about 35 per cent. These determinations may be carried out in the following manner:—

Moisture.—Powder 2 grammes of the fuel very finely, weigh between two watch glasses, and dry in a water oven. Allow to cool every hour in a desiccator and weigh. Since the weight increases after a time by oxidation, the lowest should be taken. The loss is moisture.

Volatile Matter.—Put 1 gramme of the dry coal in an even layer in a platinum crucible. Cover with the lid and place over a Bunsen flame, so that the results may be comparable. The length of flame and position of the crucible in it should be the same each estimation. So soon as the gases from the fuel cease to burn, continue the heating one minute. Allow the crucible to cool, and weigh without the lid. Loss is volatile matter.

Ash.—Weigh out 0.5 gramme of the dry fuel on a platinum crucible lid, and heat quickly and strongly till all the coke is burned. The residue will be ash. This result will be too high, owing to oxidation, but for the purposes of the cement maker it is sufficient to know how much ash the fuel will yield when burned completely in contact with air. It is very necessary that the ash should be known, as all of it enters into combination with the raw mixture. Thus, if a coke contains 16 per cent. of ash, and 40 per cent. is used to produce one ton of cement clinker, then in every ton of clinker there will be incorporated 1.28 cwt., or 6.4 per cent. fuel ash. If the raw mixture is proportioned so that when burned out of contact with the fuel the lime in the resulting clinker is 66 per cent., then when burned with 40 per cent. of fuel containing 16 per cent. ash, the lime would be $\frac{66 \times 100}{106.4} = 62.04$ per cent. Now, say the fuel contained 20 per cent. of ash, with the same raw mixture the lime in the clinker would be $\frac{66 \times 100}{108} = 61.1$ per cent. Thus it will be seen that if a cement has to be well prepared, the fuel ash entering into its composition must be known as well as the constituents of the other raw materials.

Fire Bricks.

Kiln linings being a very expensive item in the manufacture of cement, the maker should see that he gets the best for the purpose by determining the "fire value." To do this, a gross analysis is made in the same manner as explained for clay, and the "fire value" calculated therefrom as shown in the example.

A fire brick gave on analysis:—

Silica	..	..	..	54.33	per cent.
Alumina	..	..	..	40.90	" "
Oxide of iron	..	..	..	1.21	" "
Lime	..	..	..	2.55	" "
Magnesia	..	..	..	trace	" "
Alkali	..	..	..	nil	" "
54.38 parts silica	contain	28.99	parts oxygen.		
40.90 " alumina	"	19.21	"		
1.21 " oxide of iron	"	.36	"		
2.55 " lime	"	.10	"		

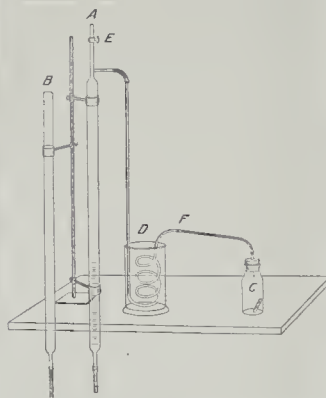


FIG. 1

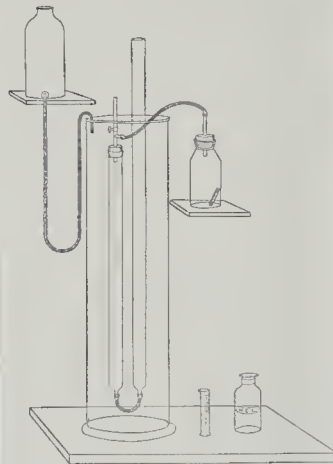


FIG. 2

gas, which is disengaged and passes through a lead worm in D, thus reaching the measuring tube in a cool state. The apparatus is allowed to stand at rest for about three minutes, with the bottle C placed in the jar D. The water level in A and B is adjusted, and the amount of carbonate of lime read on A. This result is low, some of the carbonic acid gas being absorbed by the hydrochloric acid. The

The total oxygen in the iron oxide, lime, magnesia, and alkalies is 46 parts.
 Then $\frac{192}{46} = 41.73$ and $\frac{28.99}{19.2} = 1.51$.
 The fire value is $\frac{41.73}{1.51} = 27.8$.

In valuing the raw material for cement making it should be borne in mind that only silica, alumina, and lime are the necessary compounds. Any other ingredients shown by analysis are impurities, some of which may be perfectly harmless, even in large quantities, while others may produce a cement of poor quality, varying in proportion to the quantity present.

Some shales contain large quantities of sulphide of iron, and are perfectly useless. Magnesia and sulphate of lime should not be present in quantity, although a large part of the sulphuric anhydride escapes as alkaline sulphate in the waste gases.

A clay containing a large percentage of insoluble silica is not good. The higher the percentage of soluble silica the better the clay, as chemical combination in the burning is more effectual where the silica exists in combination than when present in the free state as sand. A clay having too much alumina should be avoided, as it produces a quick setting and weak cement with a dirty brown colour. Iron also produces an objectionable colour. The effect of magnesia and sulphates will be discussed in another chapter.

In the tables below are some typical analyses of cement-making materials.

OBITUARY.

MR. RAWLE.—The death, on Monday, July 11, is announced of Mr. William Harry Rawle, of Manchester. Mr. Rawle was in his fiftieth year, and was formerly a partner in the firm of Messrs. Henbcoote and Rawle. He was architect of the new Roman Catholic Church of St. Mary, having a capacity for 600 persons, with presbytery, at Eccles, near Manchester, designed after the XIIIth century style, 1897-8; the conventual chapel in Victoria-park, Manchester, for the Sisters of Charity of St. Vincent de Paul, erected six years ago; and the St. Mary's-road school at Newton Heath, built in 1901 for the School Board of Manchester.

GENERAL BUILDING NEWS.

LIVERPOOL CATHEDRAL.—King Edward and Queen Alexandra visited Liverpool on the 19th inst, and there His Majesty laid the foundation-stone of the new cathedral, which is to be built on St. James's Mount. The first stage of the building work—the erection of the cathedral nave, together with the site and the foundation-stone expenses—is estimated to cost a quarter of a million. The architect is Mr. Gilbert Scott, with whom is associated Mr. George F. Bodley, R.A. Illustrations of the building have appeared in the *Builder*.

NEW CHURCH, CRESTONES, NEAR DUBLIN.—Newstones Catholic Church, when complete, will be 114 ft. long by 66 ft. across transepts, and 23 ft. across nave. The style is Romanesque, and the building consists of nave, two transepts, chancel with side chapels, and circular apse end. There are at present built the apse, chancel, side chapels, transepts, and

breadth of 60 ft. The church consists of nave and side aisles, chancel, morning chapel, organ chamber, and two large vestries for the clergy and the choir. The architects are Messrs. Habershon and Fawcener, of Newport and Cardiff. The work has been carried out by the contractors, Messrs. A. S. Morgan and Co., of Newport. The contract amounted to 4,300l. The walls are carried up in red local stone, with freestone dressings. The west elevation, facing Bridge-street, is surmounted by a bell turret, with a new bell, the top of the cross being 70 ft. above the ground. The church accommodates about 300, including the choir stalls, which provide for fifty. The organ of the old church has been overhauled and rebuilt by Messrs. Vowles, of Bristol. The font of the old church has also been fixed in the new building at the right of the west door.

CHURCH, GREENHILL, HARROW.—Lady Elbury laid the dedication-stone on Saturday last week of the Church of St. John the Baptist, Greenhill, Harrow. The new building is from the designs of Mr. J. S. Alder, and is built of stone. The seating accommodation in the old structure was 470; in the new building it will be 300.

PROBES CHURCH, CORNWALL.—Some alterations and additions are being made to this ancient church, under the direction of Messrs. St. Aubyn and Wadling, architects, of London. The work embraces the conversion of the north chancel aisle into a morning chapel, decorated with carved oak panelling. The five-light east window will be filled with stained glass, and there will be a new carved oak reredos and altar immediately beneath. The present pulpit, which is of Caen stone, will be removed and presented to St. Sithney Church, at St. Sithney, and an oak one with a carved representation of the Sermon on the Mount will be placed upon the opposite side to that the old one now stands upon. The organ is to be moved from its present position in the north chancel aisle to a new organ chamber south of the south chancel aisle. Mr. C. Miners of Marazion, is the general contractor, and the carving is being executed by Messrs. Harry Heims and Sons, of Exeter.

BAPTIST CHURCH, STOCKFIELD, NORTHUMBERLAND.—A new Baptist church is to be erected at Painshawfield, Stockfield. The chapel is to be built to plans by Messrs. W. Dixon and Son, architects, Newcastle, and will provide sitting accommodation for 200, and is expected to cost, inclusive of site, between 1,000l. and 1,100l.

PRESBYTERIAN CHURCH, CROYDON.—The foundation-stone of the new Presbyterian church, which is to be erected in South Croydon, was laid recently. The building will provide accommodation for 550 people, and the cost will be 6,633l. Mr. Charles Henman, architect, has prepared the plans, and the contractors are Messrs. J. Smith and Son.

CONGREGATIONAL CHURCH, SHIREBROOK, DERBYSHIRE.—The foundation-stones of a new Congregational church were laid on the 6th inst. at Shirebrook. The new church will seat about 350 persons, and the end gallery, when added, will accommodate from 100 to 150 more. The heating will be by means of low-pressure hot water. Externally the building will be faced with Rushley stone rock, with Cox bench stone dressings, and the rear portions of wall will be faced with Leicestershire sand stock bricks. The roof will be covered with American sea-green slates, and the small spire with lead. The contract for the church (without fittings) is about 1,550l. The architect for the scheme is Mr. C. Nelson Holloway, Nottingham, the contractors being Messrs. Lee and Kirk, of Chesterfield and Alfreton.

UNITED METHODIST FREE CHURCH AND SCHOOLS, SEVEN KINGS.—The foundation-stone of these buildings was laid on the 16th inst. The portion of the building now being erected embraces the church nave and temporary apse, also a square tower, with open tracery parapet, and surmounted by a spire and hial vane rising to a height of 91 ft.; also main schoolroom, 51 ft. by 40 ft., together with superintendent's room, etc., and the usual conveniences. The contract amount for this portion is 3,488l., and 400 persons in a mixed congregation will be accommodated. The facings are of red brick, the dressing in Bath stone. The architects, whose designs were selected in a recent competition, are Messrs. George Baines and R. Palmer Baines, Clements-inn, Strand, London, W.C. The contract is let to Mr. C. North, of Stratford.

BAPTIST CHURCH AND SCHOOLS, SWINDON.—Baptist church and schools have been erected in the Crikklade-road, Corse-hill, Swindon. The church, which will accommodate about 400 persons, is built of red bricks, with St. Aldhelm Bath stone dressings, and has an open pitch-pine roof, covered with green slates. The baptistry is sunk in the chancel floor. The schools are in the rear of the church, and have accommodation for about

LIMESTONE.

	Sussex Chalk.	Grey Chalk.	Crystalline Lime-stone.	Limestone from Lehigh Valley, U.S.A.	Blue Lias Lime-stone.
Moisture	15.20	3.05	.25	—	1.80
Carbonate of lime	82.39	87.5	99.08	—	84.55
Carbonate of magnesia	1.56	1.0	—	—	—
Silicious matter	.22	—	—	—	11.15
Iron and alumina	trace	8.45	.64	—	2.33
After Drying.					
Carbonate of lime	98.53	90.90	82.05	84.45	—
Carbonate of magnesia	1.71	.65	—	6.27	—
Silica	—	—	9.92	8.48	—
Iron and alumina	.24	8.38	3.77	.75	—
Lime	—	—	.41	—	—
Magnesia	—	—	2.92	—	—
Silicious carbonate	—	—	1.63	—	—

MARLS.

	1	2
oxide of iron	2.62	—
Carbonate of lime	50.31	78.16
Carbonate of magnesia	2.21	.73
Sulphate of lime	trace	trace
Water and organic matter	10.00	2.27
Silicious Matter.		
Silica	21.91	17.83
oxide of iron and alumina	9.46	2.85
Lime	1.48	1.0
Magnesia	.53	—
Alkali	1.39	—

LIAS SHALES.

	1	2	Cement rock from Lehigh Valley, U.S.A.
Moisture	10.60	12.47	4.90
Silica	52.50	34.96	16.55
Alumina	29.15	20.32	3.55
oxide of iron	—	3.18	—
Carbonate of lime	3.64	23.44	—
Alkalies	4.0	5.43	—
Lime	—	—	40.55
Magnesia	—	—	3.35
Carbonic acid	—	—	30.46

CLAYS.

	Gault Clay.	London Clay.	River Mud.
Carbonic acid	11.38	—	—
Water and organic matter	6.69	3.12	7.45
Insoluble silica	23.81	36.20	22.74
Soluble silica	18.43	20.70	36.56
Alumina	15.96	22.72	21.21
oxide of iron	3.74	—	—
Lime	14.69	—	1.40
Carbonate of lime	—	4.05	—
Magnesia	—	1.47	1.26
Carbonate of magnesia	—	7.15	—
Sulphuric anhydride	1.30	nil	4.27
Alkalies	1.02	—	5.11
Sulphide of iron	—	—	trace

about 15 ft. of the nave. But the foundations for the whole structure, including tower, are already laid, and about 40 ft. of a temporary wooden structure erected between the foundations, leaving room for the main building to be completed outside and over it. The walls of the transepts are carried on three arches, supported on Aberdeen granite shafts, with carved caps and bases. All arches and window jambs and recesses are deeply moulded. The chancel, transepts, and passages are tiled. The windows are glazed with tinted lead lights, supplied by Messrs. W. Martin and Son. The contractors were Messrs. Kinlen Bros., of Crestones, and the architects, Messrs. Wm. H. Byrne and Son, Dublin. The whole structure, at present, will accommodate about 700 persons, and when finished 850.

MISSION CHURCH, FORNETT, NORFOLK.—The foundation-stone has just been laid of the mission church, to be erected at Fornett End. The building will consist, when completed, of a nave, to seat 110 persons, chancel, vestry, and western porch. At the present time it is proposed to erect only the nave and porch. The walls are to be built of red brick with Cossey brick windows, mouldings, strings, and buttresses. The upper portion of the walls will be finished with rough cast stucco. The nave will consist of three bays, with three light windows in each, on both the north and south sides, and the windows will be treated with Cathedral glazing. The roof will be of open construction. The floor of the porch will be laid with 4 in. red Staffordshire tiles, with appropriate border. The roof of the nave is to be covered with permanent green slates, and the porch with best Brocley tiles. Messrs. James and Chellis Humphreys, of Fornett, have obtained the contract for the work, and are carrying it out from the plans and specification, and under the personal supervision, of Mr. Arthur J. Lacey, architect and Diocesan Surveyor, of Norwich.

ST. LUKE'S CHURCH, NEWPORT.—The new Church of St. Luke, Bridge-street, Newport, Mon., was dedicated recently by the Bishop of Llandaff. The church, which has been built upon the site of the old chapel-of-ease, in the parish of St. Woolos, extends from Bridge-street to the frontage of Railway-street, and has a length of 142 ft. and a

300 children. A kitchen is attached, and the main portion of the schools is divided up by folding partitions, so that the schools may be converted into an assembly room. The cost of the whole of the buildings, including seating and furniture, has been about 3,500*l.* The work has been carried out by Mr. A. J. Colborne (Swindon), under the supervision of the architect, Mr. George A. Lansdown (London), whose designs were accepted in competition.

OFFICES, SUNDERLAND.—New offices for the River Wear Commissioners are to be built upon the site of the old Sunderland Post Office. The architects are Messrs. J. Henderson and Hall, of Sunderland.

WESLEYAN CHAPEL, BONBY LODGE, HULL.—The memorial-stone of the Bonby Lodge new Wesleyan Chapel was laid recently. The architect is Mr. Gibson, of Stalybridge, and Messrs. W. King and Son are the bricklayers, Messrs. King and Son stone masons, and Mr. J. Stamp joiner.

SYNAGOGUE, NEW CROSS.—The laying of the foundation-stone of the New Cross London Association Synagogue took place recently. The new synagogue will be Romanesque in style, and is being erected from the design of Mr. Duliss Joseph. The exterior will be of red brick with stone dressings, and there will be a complete system of electric lighting. The total cost is estimated at 5,000*l.*

COUNCIL SCHOOLS, BRIMINGTON, DERBYSHIRE.—The new council schools at Brimington, which were opened on the 9th inst., have been erected from the designs of Mr. W. Cecil Jackson, architect, of Chesterfield. The contract for the work has been carried out by Mr. W. Forest, Chesterfield, the heating apparatus being installed by Mr. W. Huslam, Harstoft. The cost has been 4,000*l.*

NATIONAL NAUTICAL SCHOOL, PORTSHEAD, BRISTOL.—Her Royal Highness Princess Henry of Battenberg laid the foundation-stone last week of the National Nautical School, which is to be erected at Portshead. The site is at the end of the Nore Road, close to the channel, and near the Nore Lighthouse, and it consists of about 15 acres of land belonging to the Corporation of Bristol. The building has been designed by Mr. Edward Gabriel, of London, and the contract has been let to Messrs. W. Cowlin and Sons, of Bristol, and the scheme will involve an expenditure of about 30,000*l.* The main building consists of two wings divided by a central tower. It will have a frontage of 332 ft., and will rise 45 ft. high from the parade ground. Owing to the rapid fall in the site there will be a basement extending the whole length of the building, and 40 ft. in width. The space thus provided will be used as carpenters', tailors', shoemakers', and other shops, and for stores, laundry, and heating apparatus. There will also be a band-room and instruments' store. The school will have three stories of brickwork, finished with a facing of white rough-cast, with red brick plinth, and red brick Ionic pilasters between the windows. The roof will be covered with red Bridgewater tiles.

Under the tower in the central building will be the main entrance, surmounted with carved figures of Neptune and Britannia. The tower, which is to contain a clock 90 ft. high, will be finished with a wood and copper sheath. The small towers at the corner of each main block will contain staircases. The two upper floors are to be used as dormitories, and from each dormitory there will be two staircases for use in case of emergency, the steps of solid blocks of timber. The entrances for the boys will be on each side of the central building. The ground floor of the west block will be used for a mess-room for the boys, officers' mess-room, with kitchen, scullery, and store-rooms adjoining. At the extreme end of the west block is to be the chief officer's house and rooms for resident schoolmaster. At the rear of this block there will be a bay for sick boys, for which hereafter a separate cottage hospital will be substituted when the necessary funds are available. The great floor of the east block is to be devoted to schoolroom and classrooms, library, and teachers'-room. At the extreme east of this building will be the residence of the captain-superintendent, which will be connected with the main building, and from which house there will be supervision of the parade ground and playing fields. The central building is to contain committee-room on one side of the main entrance, and offices for the captain-superintendent on the other. On the upper floors of this building there are to be spare cabins for officers and a ward for boys who may hereafter visit the institution. Each large dormitory will have four officers' cabins, and inspection windows for efficient supervision. The floors of the dormitories are to be of solid balks of timber, tongued together, and the space will be made to resemble the deck of a vessel as much as possible. The lads will sleep in hammocks, as on board ship. The bathrooms and lavatories will adjoin the dormitories, but cut off by means of cross-ventilated lobbies. Passing through the hall

from the main entrance, access will be gained to the gymnasium, which will be at the rear of the central building. The dimensions of the gymnasium will be 84 ft. by 50 ft., and 20 ft. high in the springing of the roof. It will be used not only for physical exercise, but also for meetings and entertainments, and for services when the weather may prevent the boys attending church. The buildings are to be warmed by hot water on the low-pressure system. The heating and hot water-supply apparatus is to be erected by Messrs. James Crispin and Sons, of Bristol. The granolithic paving for the courtyard and staircases is being executed by Messrs. W. B. Wilkinson and Co. From the parade ground access will be made by broad flights of steps to a lower terrace. The land between this and the channel is to be laid out as playing fields. There will also be a jetty and boathouse on the fore-shore. Drainage is to be by means of a septic tank and a filter, of the type designed by Mr. Wallis Stoddart, the effluent flowing into the sea. Rain water from the roofs will be collected in a large central tank, and used to supply boilers and the laundry. Accommodation will be provided in the school for from 350 to 400 boys.

INFANT SCHOOL, ABERCYNON.—The Mountain A-H Education Authority recently opened the new Infant School for infants at Greenfield. The school, which cost the estimating site, 4,243*l.*, is built to accommodate 250 infants, the plans being prepared by Mr. O. Evans, architect, Pontypridd, and the building erected by Messrs. Jenkin and Sons, Porth.

SCHOOLS, ABERBARGOED.—The opening ceremony of Aberbargoed schools took place recently. The new school provides accommodation at present for 200 boys and girls, and 150 infants, and is planned with a view to future extensions for 150 boys and girls, and 100 infants. There are four class-rooms in the mixed department, opening on to a central hall. The infants' department has for the present three class-rooms, opening on to a central hall. The four central class-rooms are divided by means of a sliding swivel partition, which allows of these rooms being thrown open into two large rooms if needed. The contractors were Messrs. W. Williams and Sons, of New Tredegar, and the cost was a little over 6,500*l.* The plans were prepared by the Board's Architects, Messrs. James and Morgan, Cardiff.

NEW MISSION HALL, PRESTON.—The opening of St. Mark's Mission Hall, Preston, took place on the 9th inst. The building has been erected by Mr. George Gardner, builder, Preston, from the designs of Messrs. Swindells and Rawcliffe, architects, Fishergate, at a cost of over 1,100*l.*

PROPOSED PUBLIC BATHS, HANDSWORTH, BIRMINGHAM.—A site has been acquired in Grove-lane, Handsworth, by the District Council for the purpose of erecting new public baths. The building will comprise two swimming baths, the first-class bath measuring 100 ft. by 35 ft., and the second-class, 100 ft. by 50 ft. There will also be Turkish and slipper baths. The plans for the work have been prepared by Mr. John Osborne, of Birmingham, and the cost will be 18,000*l.*

HOTEL DORNOCHE, N.B.—A new hotel has been erected by the Highland Railway Company at Dornoch. The external walls of the new building are rough cast in Portland cement, use being also made of stone dressings. Half-timbered work is introduced into the gable tops; the main portion of the roof is slated, with the use of red tiles in certain portions, red tile ridges and red terra-cotta chimney pots. Internally the building is finished in pitch-pine, the walls and ceilings of the principal apartments being panelled in that wood. The architects of the building were Messrs. Cameron and Burnett, Inverness, and the work was carried out by the following contractors:—Mason work, Messrs. Wm. Alexander and Co., Inverness; iron work, The Rose-street Foundry Company, Ltd., Inverness; carpenter, Mr. James Robertson, Forres; plumber, Mr. William Anderson, Glasgow; slater, Mr. John Reid, Inverness; scablator, Messrs. W. G. Walker and Sons, Edinburgh; plaster and tile, Mr. George Gray, Elgin; painter and glazier, Messrs. J. Tullock and Co., Inverness; electric light, Messrs. Wylie and Lochhead, Glasgow; lift, Messrs. A. and P. Steven, Glasgow.

NEW INSURANCE OFFICE, NORWICH.—A new head office has been erected for the Norwich Union Life Insurance Society in Surrey-street, Norwich. The building is stone-fronted, and is recessed from the street, having a rusticated basement in the central portion, with six stone columns, each about 50 ft. in height. These columns support a pedimented entablature. There are flanking blocks on either side, the chief features in which are balconies and detached columned windows, and also, at the extreme ends,

pavilions running out to the street front. These pavilions are recessed for two heroic-sized statues in stone, under stone canopies. There is a central hall, about 70 ft. square, and forty marble monolith columns are used in its construction. The whole of the walls, door linings, etc., are finished in marble. The staircase is also of marble, and the marble walls are continued on the first floor and along the corridor which gives access to the board and committee rooms. The chieft of the corridor floors is also laid with marble pavements. The central hall is covered with a dome enriched with colour and gold. The architects are Messrs. George J. and F. W. Skipper, of Norwich.

THE CARNEGIE LIBRARY AT GAINSBOROUGH.—For a public library at Gainsborough, Mr. Andrew Carnegie has offered 4,000*l.* The plans have been prepared by Mr. H. G. Gamble, of Lincoln, and the tender of Messrs. Sprakes and Son, of Doncaster, has been accepted at 3,100*l.* The site of the library is the square fronting the Old Hall.

LIBRARY, LOWESTOFT.—The foundation-stone of a free library was laid at Lowestoft recently by the Mayoress (Mrs. H. Bourne Walker). The site of the new building is in Clapham-road, adjoining the Technical Schools. The architect is Mr. G. W. Leighton, of Ipswich, whose plans were selected in competition by Mr. J. Bootle, F.R.I.B.A., of Yarmouth. The main entrance is by way of the tower porch, the new-room being the first apartment reached. A corridor gives access to the borrowers' lobby. A marble staircase, lighted by a dome, ascends to the first floor, where, overlooking Clapham-road, is the magazine-room, which has an open timber roof. At the other end of this floor is the reference library. This room will be lighted by a central dome, as well as by side windows. There are other staff rooms and offices, and retiring-rooms. The walls of most of the rooms, corridors, and staircase are to have a dado of Dutch enamelled tiles.

THE WORKING MEN'S COLLEGE, ST. PANCRAS.—The Prince of Wales, accompanied by the Princess of Wales, paid a visit to St. Pancras on Saturday last to lay the foundation-stone of the new buildings, in Crowndale-road, of the Working Men's College. The buildings will occupy a site at the corner of Crowndale-road and Camden-street, not far from the Cobden statue, in the Hamstead district. W. D. Caroe, architect to the Ecclesiastical Commissioners, is the architect for the new college. His plans show a hall, to accommodate 250 persons, offices for administrative purposes, with common-rooms, clubrooms, and gymnasium for the students, a library, fitted for 10,000 books, museum, and a number of class-rooms. There are added electricity and chemistry laboratories. Altogether there is teaching space provided for 700 students.

POLICE STATION, CITY.—The Lord Mayor opened the new police station at Moor-lane, Fore-street, recently. The work has been carried out by Mr. Arthur Porter, of Tottenham, from the designs of Mr. A. Murray, the City Surveyor. The new structure takes the place of an old police station on a smaller area, and gives accommodation for sixty-seven single men to reside on the premises instead of thirty-three as formerly.

ANCOATS HOSPITAL CONVALESCENT HOME, SANDLEBRIDGE.—This building is situated on the road from Soss Moss to Moberley, turning to the west from Alderley Edge and Astle-road past Warford Hall. The main building faces nearly due south, and has projecting wings at the ends. These are connected to sunhouses by covered ways which form the eastern and western sides of the forecourt, and lead out of the day-rooms for men and women as places for walking and sitting in in wet weather. There are separate entrances to and from the grounds, with day-rooms, dormitories, staircases, and sanitary arrangements, the latter cut off with intercepting lobbies. There are a few small bedrooms for special cases on either side. The dining-hall is in the centre and common to both sides of the house, and the kitchens are to the north of the dining-hall, connected by a covered way to the outdoor buildings. These surround a kitchen court or quadrangle, open on one side with flagged walks and grass. The buildings have been erected under the supervision of the architects, Messrs. Thomas Worthington and Percy S. Wortbington, of Manchester.

NEW WING, RICHMOND HOSPITAL.—The new wing of the Royal Richmond Hospital, constructed as an out-patients' and ophthalmic department, was opened on the 9th inst. by the Duchess of Albany. The new out-patients' department building, erected to the design of Mr. Frank Brewer, architect, is separated from the main hospital, and fronts to the Shaftesbury-road. The building is approached by a flight of steps, and has a wide entrance with vestibule, enclosed by a polished oval

reen and folding doors. Next the vestibule is a hall with mosaic paving, and on the right is the waiting hall, with open-timbered roof and lantern light. This hall is divided into two by a movable partition, thus giving a separate waiting-room for male and female patients. The hall is paved with polished oak block flooring, and the walls are lined with bouillon ware. The woodwork is stained green and varnished. There is a suite of four consulting rooms in the rear of the outer hall. The dispensary, which is on the left of the entrance-hall, has been fitted up by Messrs. Law and Son. Below the dispensary are the dispensers' stores, approached by a side entrance. The first floor, which is approached by a stone staircase from the entrance-hall, is to be used for ophthalmic patients. The heating of the building is by hot water with radiators, and by Boyd's air-chamber stoves. The hot water heating has been carried out by Messrs. Jeffreys. The chimney pieces, wall-nings, decorative panels, etc., were carried out by Messrs. Dorr and Co. There is electric lighting throughout. The builders are Messrs. S. N. Soole and Sons, of Richmond.

LIBRARY, TINSLEY, YORKSHIRE.—The cornerstone of a public library has just been laid at Tinsley. The new library will stand at the end of Bawtry-road. On the ground floor will be a porch, entrance-hall, and staircase, a reading-room, 30 ft. by 18 ft., a lending library, 15 ft. 6 in. by 15 ft., and hall for applicants for books. The first floor will be provided with a ladies' reading-room, reference library, and a spare room for stores, etc. In the basement there will be a hot-water apparatus for heating the building, and on the ground and first floors there will be a lavatory and other accommodation for the visitors. The building is in the Renaissance style. It will be faced with local pressed bricks and Grenoside stone casing. The architects are Messrs. Holmes and Watson, Sheffield, and the contract for the building, which amounts to 1,276l. 16s. 8d., has been let to Messrs. Gray and Sons, Builders, Tinsley.

PRINTING AND PUBLISHING PREMISES, SOUTHAMPTON.—New premises for the proprietors of the *Hampshire Advertiser*, *Hampshire Independent*, and *Southern Daily Echo* are to be erected above Bar from the plans of Mr. H. Hill.

NEW CHURCH, FISHPONDS, BRISTOL.—On the 7th inst. the foundation-stone was laid of All Saints' Church, Fishponds, the eastern portion of which is now to be carried out, and which consists of a chancel, south morning chapel, and north choir vestry (with organ chamber above), with a clergy vestry on its eastern side. One bay of the nave and aisles is also to be erected. The style adopted is XIVth century Gothic. The walls are to be of rock-faced Pennant stone, with Bath stone dressings, the arcades having clustered shafts of abbed Pennant stone, and those to support principals will be of polished marble. The roofs will be covered with brindled Broseley tiles. The architects are Messrs. Lingen Barker and Co., of London, Bristol, and Hereford, and the builders Messrs. Clark and Sons, of Fishponds.

STAINED GLASS AND DECORATION.

STAINED GLASS WINDOW, WANDSWORTH.—The unveiling of the new stained-glass north-west window in St. Stephen's Church, Wandsworth, took place recently. The work has been designed and executed by Messrs. Jones and Willis, of London.

WINDOW, ST. JOHN'S CHURCH, HOXTON.—The Bishop of Ripon unveiled on Saturday last a memorial-window, placed by relatives and friends in St. John's Church, Hoxton, in the memory of the late Dean Farrar. The window, designed by Mr. J. A. Reeve, was the architect of the restored church, and was executed by Messrs. Campbell and Christmas, of West Brompton, and represents Christ seated in glory as seen by St. John in his vision at Patmos. The scheme of coloring is executed to harmonise with the decoration of the church, the subject commemorating the representation of the vision of St. John.

APPOINTMENTS.

DERBY.—A meeting of the Derby Education Committee was held a few days ago for the purpose of appointing a building surveyor, an entirely new office rendered necessary by the Education Act. The commissioning salary for a year was fixed at 1,500l. 5 applicants, and four of these attended the committee's meeting. They were Messrs. C. Copestick (in the office of the County Surveyor at Derby), W. Percival (Longton), S. Walker (Liverpool), and G. H. Widdows

(Derby). Mr. Widdows secured the appointment. The successful candidate has qualified for associatehip of the Royal Institute of British Architects, and has been in the service of the Derby Corporation for some years.

BOLTON.—Mr. D. Campbell has been appointed to the position of Architect and Buildings Inspector to the Education Committee.

DEVON COUNTY EDUCATION COMMITTEE.—This Committee have made the following appointments on the Architect's staff:—Chief assistant, J. Sidney (York); clerks of works, W. J. Davies (Hereford), R. J. Mathews (Penarth); draughtsmen, H. T. A. Halestrap (London), J. G. Hinton (Lancaster).

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of the undermentioned sanitary inspectors:—Lewisham—Miss Irene Whitworth; St. Pancras—Mr. E. W. Adkins; Southwark—Miss M. R. Burrows, and Miss H. M. E. Blackwell; Woolwich—Miss A. M. Middlebrook.

SANITARY AND ENGINEERING NEWS.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science, held at Liverpool on July 15 and 16, ten candidates presented themselves, and the following five candidates were awarded certificates:—A. Brook, Lintwaite; H. W. Garside, Rochdale; C. B. Goodyer, Manchester; A. Reoch, West Norwood; and E. Ryder, Levenshulme.

FOREIGN.

FRANCE.—M. Mercie's monument to Alfred de Musset, which was exhibited in the last Salon, is to be erected outside the Theatre Français.

It is understood that M. Carolus-Duran will succeed M. Guillaume as Director of the French School at Rome.—The churches of Saint Sulpice, St. Bernard, and St. Etienne du Mont are shortly to undergo extensive repairs and restorations.—The General Council of the Seine Department has voted 3,700,000 francs for the rebuilding of the bridges of Notre Dame, de la Tournelle, and l'Archevêché, at Paris.—M. Coutan and M. Verlot have been commissioned by the Government to produce two large sculpture groups symbolising "Le Terre" and "l'Eau" for the decoration of the park of St. Cloud. MM. Sicard, Paul Gasq, Hector Lemaire, and M. d'Inc. Symour are to execute the "Heurs du Jour," and MM. Gustave Michel, Larche, Desbois, and Lefebvre are to execute "Les Quatre Saisons," all for the park of St. Cloud.—The Municipal Council of Paris have purchased the estate of Bagatelle at a price of six and a half million francs, to add it to the Bois de Boulogne.—New school buildings (*groupes scolaires*) have been erected at Puteaux, from the designs of M. Desestre; at Issy-les-Moulineaux, from the plans of M. Delaire; and at Asnières, from the designs of M. Ricard.—A monument to the memory of Augusta Holmes, the musician, by M. Caillard, has been erected in the cemetery at Versailles. It consists of a stele with a portrait medallion, surmounted by a figure of a muse draped in mourning, and leaning on a lyre.—The Municipal Council of Brest have resolved on the erection of a Bourse du Travail, at a cost of 100,000 francs.—The death is announced at Beyrouth, at the age of eighty-three, of a very learned archaeologist, M. Paul de Saint-Aignan, of the Franciscan order. He was a member of the Institut, of the proceedings of which he contributed numerous papers on numismatics and on Oriental archaeology.

GERMANY.—The third exhibition of Industries and Arts at Dresden will take place in 1906; the preparations are under the management of the architect, Herr W. Lossow. A sinking in the new Maximilian bridge at Munich was observed last month; the matter is being thoroughly investigated.—The sum of 2,500,000 francs is to be expended on extensive restoration at the cathedral at Cologne.—A girls' school is to be built at Freiburg, from the designs of the architect, Herr Leon Hertling; the building is to be in Early Renaissance style.

AUSTRIA.—The foundation-stone of the new hospital at Vienna was laid on June 21.—The sculptor, Alfonso Canciani, is at work on a statue of the Empress Elizabeth, to be erected at Pola.—The church at Oberloitsch is being enlarged under the direction of the architect, Herr Ferdinand Trummler.—The fountain erected in Vienna in commemoration of the golden wedding of the Archduke and Archduchess Rainer was unveiled on July 5; the work has been carried out by the sculptor, Herr Kaufungen.—The statue of the painter Hans Canon, by Professor Wever, is completed, and will be set in the Park at Vienna; the figure is in bronze and life-size.

SWITZERLAND.—Herr Karl Köehlin, of Basel, has been appointed director of the Swiss Confederation Railway, in place of the late Herr W. Hensler.—The new town hall, at Basel, by the architect, Herr E. Vischer, was opened on June 23.—When cleaning the Dominican Church, at Bern, some interesting frescoes were discovered, among others one representing the Day of Judgment, and several symbols and coats of arms.

THE ST. LOUIS EXHIBITION.—There seems to be, as yet, very little interest taken in the St. Louis Fair, if we may judge by the paucity of information concerning it which is to be found in the daily papers, a scarcity so marked as to cause one to suspect that the authorities may have done something to lead the newspaper managers to feel that it is just as well to let the affair pass as merely a local matter. This attitude would be very unfortunate for the financial outcome, but it is not the only misfortune that already attaches to the Fair. The wrecking of a building by a mob was not exactly a good advertisement, and the recent order that the Exposition guards shall arm themselves with slung-shots is another warning that visitors to St. Louis this summer may expect exciting experiences before they get away from the town. Moreover, there have already occurred two or three fires in the smaller buildings within the grounds, fires, fortunately, that the excellent fire-lighting arrangements prevented from attaining dangerous proportions.—*American Architect.*

ITALY.—The Municipality of Spezia have voted a sum of 400l., to be assigned as a premium to the winner of an international competition, who presents the best drainage scheme for that city and suburbs. The competition will be open until December 31, 1905, on which date it will be finally closed, and foreign architects, engineers, and doctors are to be allowed to compete. A commission will be appointed in due course by the Municipality to examine the various plans and award the prizes. Inquiries with regard to the competition should be addressed to Il Signor Sindaco, Spezia, Italy.—A despatch received through the Foreign Office from H.M. Ambassador at Rome reports that a Bill providing for the construction of the Apulian aqueduct by the State has been submitted to the Italian Chamber of Deputies, and been favourably received. The original plan has undergone certain modifications in the Bill now presented to Parliament, which only concerns the construction of the aqueduct, at a cost of five millions sterling, to be provided by gradually increasing assignments spread over the budgets of the next twenty years. The up-keep and working of the aqueduct will form the subject of a separate Bill. A clause has been inserted authorising the Government, within a period of eighteen months from the publication of the new law, if it is agreed to by Parliament, to hand over the construction and working of the aqueduct to private enterprise under the conditions laid down in the law of June 26, 1902. If, therefore, as appears probable, the new Bill should, with certain modifications, be adopted, the participation of foreign capital will not be necessarily excluded.

ROMANIA.—PRIZES FOR ARCHITECTURAL DESIGNS.—The Roumanian Minister of Public Worship and Education has invited designs for the construction of a cathedral at Galatz, premiums of 160l., 120l., and 60l. being offered for the three best designs. The competition will be closed on August 25.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. E. F. M. Elms, architect, having purchased from the Trustee in Bankruptcy of his late partner, Mr. W. H. Arber, his share in the practice of architects and surveyors formerly carried on by Mr. Arber and himself in partnership, under the style of "J. H. Wimperis and Arber," has arranged to take into partnership Mr. Sydney Jupp, who has been for many years identified with the business, and the practice will, for the future, be carried on by them, at 25, Sackville-street, W., under the style of "Elms and Jupp."—Messrs. Killee Bros., the proprietors of the Hopton Wood stone quarries at Middleton, have incorporated their business as a limited liability company. The business was founded by the father of the present senior member of the firm about seventy years ago.

CHURCH OF ST. PETER, BETHNAL GREEN.—At a sitting of the Consistory Court in St. Paul's, on June 30, the Chancellor of the Diocese of London consented to grant a faculty to the vicar and churchwardens for the erection of a new vestry, to be 15 ft. by 11 ft., upon a portion of the disused churchyard, and abutting upon the present.

vestry, which is quite inadequate for its purpose. No interments have been made in the ground chosen for the new building, and all that part of the churchyard will be covered with concrete. Dr. Tristram, K.C., stated that he felt justified in law, and under the provisions of the Disused Burial Grounds Act of 1884, in complying with the prayer of the petition, and he also agreed to extend the faculty to the screening off of a portion of the church, near the new vestry, for use as a choir vestry. The church was erected in Hackney-road in 1841, after Lewis Vulliamy's plans and designs, for about 1,000 sittings.

BUILDING BY-LAWS, CARDIFF.—In answer to a question put by Mr. John Chappell at a meeting of the Public Works Committee on Thursday last week, Mr. Veall and other members stated that many of the by-laws were ridiculous. The limit of headroom was 10 ft., and if a man wanted to get 10 ft. 6 in. he must increase the thickness of the walls from 9 in. to 13 in. Mr. Harpur called attention to several breaches of the by-laws, in one case the builders not having put in woodwork of the dimensions required. Mr. Morgan Thomas remarked that some builders believed the Corporation would not enforce the by-laws. Alderman Mildon said the same by-laws were in force at Barry, but in many respects absolute compliance was not insisted upon. The Borough Engineer replied, in answer to a question, that he did not know any place where they were insisted upon in their entirety. The Committee endeavoured to get alterations made, but the Local Government Board would not accept them. Alderman David Jones observed that some of the by-laws were absurd. On the motion of Mr. Chappell, it was resolved that in the case referred to the by-laws be adhered to, and that proceedings be taken against the builders for not carrying them out.—*Western Mail.*

DISFIGUREMENT BY ADVERTISEMENTS.—In addition to the Metropolitan Borough Councils which have already been reported in the *Builder* as having taken action upon the circular letter from the Royal Institute of British Architects upon the abuse of buildings by advertisement hoardings, the following have considered the matter:—St. Pancras Borough Council has resolved to send a communication to the Institute, expressing sympathy with the objects they have in view; Shoreditch Borough Council has passed a motion agreeing with the purport of the Institute's letter, and in support of legislation to regulate the display of advertisements; Paddington Borough Council has, upon the recommendation of the General Purposes Committee, resolved to inform the Institute that it has "no observations to make" upon the letter.

WYTHAM HILL.—The name of the clerk of works, given in our last issue as "Mr. Fletcher," should have been "Sletcher." The mistake arose from a not very clear handwriting in the communication sent to us. Proper names should always be very clearly written, or mistakes are inevitable.

TOTTENHAM COURT-ROAD (SOUTH END) IMPROVEMENT.—Mr. B. L'Anson Breach, of No. 29, Fleet-street, surveyor, has just issued his award, dated July 14, made by him as arbitrator, under appointment by the Local Government Board, for the purposes of the London County Council's Improvements Act of 1897, in respect of the demolition of the southern end of Tottenham Court-road, by the demolition of the block known as Bozier's-court. Mr. Breach's award relates to a valuation made by Mr. James Crean in 1898, under appointment by the Local Government Board, and to the premises on the west side of the footway which, until recently, extended from Oxford-street to Tottenham Court-road. He adjudges that the enhanced values, arising out of the improvement, of No. 14, Tottenham Court-road and Bozier's-court, and No. 4, Oxford-street and Bozier's-court are, respectively, 5,200l. and 7,700l., as compared with the Council's assessments of 7,432l. and 7,840l.; and he confirms the Council's assessments, made in July of last year (to which, however, no objection had been taken) in respect of the enhanced values of the four remaining properties—namely, the entrance to the Oxford Music Hall, 1,271l.; No. 2, Tottenham Court-road, 1,588l.; No. 3, 1,857l.; and Nos. 4 and 5, 1,380l. The fee simple of No. 4, Oxford-street, vests in Balliol College, Oxford. The schedule attached to the awards specifies the improvement charges on the several six properties, being, respectively, equal to 3 per cent. per annum upon one-half of the enhanced values; the latter are assessed after all fair and proper deductions made for rates, taxes, etc.

DRURY-LANE THEATRE.—The arbitration between the Drury-lane Theatre Company and the London County Council, as to the works to be done to comply with the requisitions of the latter body, is being held before Mr. John Slater, architect, the arbitrator. Mr. Philip

E. Pilditch is the architect acting for the Theatre Company, and Mr. W. E. Riley, the Superintending Architect to the London County Council, for the Council, assisted by members of their respective staffs.

THE EXPORTATION OF WORKS OF ART.—A Bill has been presented to the Spanish Cortes, proposing to prohibit the exportation of works of art from Spain, except by special authorisation from the Minister of Education and Fine Arts. The following are to be regarded as works of art:—Architectural monuments, sculptures, paintings, inscriptions, books, manuscripts, coins, medals, costumes, tapestry, engravings, pottery, arms, instruments, and all other objects of archaeological or historical interest. The Bill, however, empowers the Minister of Public Instruction to allow the temporary exportation of works of art, under guarantees insuring their preservation and re-importation into Spain. The Bill does not apply to the works of living artists, or to reproductions of such works.

ENGLISH CEMENT IN PORTUGAL.—Mr. Consul Grant writes from Oporto that there is a steady increase in the demand for English cement, but he adds that very little now comes from the United Kingdom, on account of its inability to compete in price with that coming from Belgium. In 1900, the imports amounted to 5,135 tons; in 1901, 5,708 tons; in 1902, 5,923 tons; and in 1903, 5,974 tons.

HONDURAS TIMBER.—Acting-Governor Cork, reporting on the Book of British Honduras for the year 1903, states that the quantity of cedar forwarded to the United Kingdom during the year was 292,201 ft., value 1,483l., and the quantity of mahogany so forwarded was 1,887,336 ft., value 111,116l. The export of mahogany and cedar to the United Kingdom is now limited to wood of good grain and of large size, the price obtained for wood of this class repaying the cost of squaring, etc., whereas, in former years, the total output was sent to that market. The decrease in 1902 shipments of mahogany to England was 1,846,790 ft.; in 1903, there was a further decline of 1,951,954 ft. The general output of mahogany and cedar, however, during 1903, showed an increase, as compared with 1902, of 3,335,132 ft., this increase being solely due to the operations of two American firms engaged in supplying the American market. The wood is purchased unsquared, and paid for on the spot, thus saving the wood-cutters considerable labour and expense in preparing the logs for the home market, freight, etc.

MUSEUM OF PRACTICAL GEOLOGY, JEMMYN-STREET.—Arrangements have been made which will make it unnecessary to close the museum for a month in autumn as heretofore; it will therefore remain open to students and visitors daily.

CONNECTION.—Referring to the Savoy Hotel announcement in our issue for June 25 last, Messrs. W. and J. R. Hunter ask us to point out that the oak *only* for the panelling at Simpson's Restaurant was supplied by them, not the panelling itself.

INDIAN ARCHEOLOGY.—According to the annual Blue Book on the progress and condition of India, the archeological surveyor was occupied during the past year in visits to monuments in Ahmedabad, Bijapur, and other parts of Bombay, and also toured with the Director-General of Archeology in Central India, Rajputana, and Sind. The expenditure on the conservation of ancient monuments in the Bombay Residency amounted to 1,120l. In the United Provinces a report on Akbar's tomb at Sikandra, near Agra, by the late Mr. Smith, was submitted to the Government; the staff was engaged in surveying historical buildings in the Agra fort. The amount of 10,570l. was spent in the province during the year from Government revenues on conservation. The Surveyor of the Punjab circle reports that several important works were commenced and partly completed with a view to the conservation of monuments, an allotment of 4,300l. having been made for the purpose. He also submits a memorandum on the preservation of archeological material in the Peshawar district. In Madras the expenditure is given as 1,477l. The excavation of prehistoric remains at Adinachallur was the most notable operation of the year, and resulted in the unearthing of a very large number of objects of great interest. In Bengal the Archeological Surveyor visited seven districts, and also Assam, in the course of his tours. The Director-General was to have visited Bengal, but the visit had to be postponed. In Burma, 2,746l. was spent on conservation. Much progress was made in improvements to the Mandalay palace and its surroundings. The Director-General has been engaged in tours of inspection in several provinces, in the course of which he was able to give advice to the local authorities with a view to the organisation of archeological efforts on a consistent plan throughout India.

Legal.

ACTON ANCIENT LIGHT DISPUTE.

In the Chancery Division on the 12th, 13th, and 14th insts. Mr. Justice Kekewich had before him the case of Kine v. Jolly, an action by the plaintiff, Mrs. Sarah Kine, the owner of a house and premises known as "Woodthorpe," Acton-road, Acton, against the defendant for an injunction and damages in respect of the alleged obstruction of the ancient lights of the plaintiff, and also for trespass. The case had been tried by his lordship before, and now came on for a re-trial on an amended statement of claim.

By the amended statement of claim it appeared that the ground floor of the plaintiff's premises had on the west side two windows, lighting respectively the drawing-room and a smaller sitting-room, and a door with glass panels and a window or fanlight over it, lighting the entrance-hall. The plaintiff alleged that, in spite of remonstrances made on her behalf, the defendant had erected and maintained, and still maintained, a high building near to the said windows, glazed panels, and fanlight, and had thereby materially obstructed the light from entering into the said dwelling-house, and interfered with the plaintiff in the use and enjoyment of the said land and dwelling-house. The plaintiff also alleged that the defendant's building projected over and overlung her land, and that the defendant, by erecting and maintaining his said building, trespassed, and was still trespassing, on her land. Hence the present claim for an injunction and damages.

The defence was a general denial of the allegations in the statement of claim.

Mr. P. O. Lawrence, K.C., and Mr. Cann appeared for the plaintiff, and Mr. Stewart Smith, K.C., and Mr. Vernon for the defendant.

Mr. Lawrence, in opening the case, said that plaintiff, Mrs. Kine, was a lady living at "Woodthorpe" with her daughter and son-in-law. That was the condition of things in October, 1902, when the next plot was sold to the defendant, Dr. Jolly, who commenced to build a house on the property. There was then a dispute as to some encroachment on the plaintiff's land, and there was an interview between Mr. Reed (plaintiff's son-in-law) and the defendant's architect, Mr. Monson. His contention was that at that interview the question of ancient lights was mentioned. Mr. Monson told Mr. Reed that the plaintiff's lights would not be interfered with. The building of defendant's house went on, and on February 10, 1902, the plaintiff's solicitor wrote a letter to the defendant saying that his building obstructed the plaintiff's light, and he should commence an action on the plaintiff's behalf if the obstruction was not removed. Defendant therefore could not say that he had erected his house in ignorance of the plaintiff's rights. The writ was issued on April 2, 1903. At that time the defendant's house was not completed, and there would have been no difficulty in so modifying the plans as to prevent the defendant's house obstructing the plaintiff's light. The plaintiff's house was an ordinary dwelling-house of a suburban character. On the ground floor it had a morning-room.

His lordship: What are the ordinary purposes of a room?

Mr. Lawrence: Habitation, I should suggest. The ordinary purpose of comfortable occupation, I should submit. Our contention will be that this building of the defendant comes within the definition of nuisance as laid down in the case of the Home and Colonial Stores v. Colls, in so far as it materially diminishes the enjoyment by the plaintiff and her household of her house as a dwelling-house.

Mr. and Mrs. Reed both gave evidence to the effect that the light of the plaintiff's house had been materially and substantially interfered with by the defendant's building.

Mr. P. W. Virgo, a merchant now residing at Teddington, but who formerly lived at "Woodthorpe," proved that the plaintiff's lights were ancient. He also said that the light of the plaintiff's house was very much diminished by reason of the defendant's building.

Mr. R. Nichols, a builder, examined, said he had lived in the neighbourhood of "Woodthorpe" for twenty-five years. He had frequently been in "Woodthorpe," and had done decorating work there for Mrs. Kine. He noticed a considerable difference in the plaintiff's house since Dr. Jolly's wall was up. The difference was that, instead of going into a nice, bright house as formerly, you went into a dingy one now.

Cross-examined.
It was impossible to read in the morning-room at all now unless you got close to the window.

Mr. E. C. P. Hodgkinson, an architect and surveyor practising in Wellington-street, Strand, said he visited the premises in question on February 3, 1903, and again on February 5, when he took measurements from which he had prepared the plans put in. The distance between the wall of Dr. Jolly's house and the morning-room window of plaintiff's house was 26 ft. 9 in., and the height of Dr. Jolly's wall was 24 ft. 6 in. He came to the conclusion that Dr. Jolly's wall seriously deteriorated the light in the morning-room of Woodthorpe," and caused a slight defect in the light of the drawing-room. The height of Woodthorpe" was also interfered with by Dr. Jolly's wall. He considered that Dr. Jolly's wall had rendered "Woodthorpe" less comfortable for the purposes of habitation. Mr. C. P. Pratt, an architect and surveyor, so gave evidence generally corroborating the evidence of the last witness. This evidence included the plaintiff's case.

His lordship said he thought it would be convenient if Mr. Stewart Smith told him his view of the position of the law as it was applicable to the facts as they emerged. Mr. Stewart Smith said that the decision in the Colls case had entirely changed the issue. He first thing that a plaintiff had to establish was not whether there had been a diminution of light, but whether there had been a nuisance. The question therefore was, was there in the present case a nuisance within the meaning of the decision of the House of Lords in the Colls case? He submitted that a nuisance was something for which a jury would award damages. His evidence would prove that there was no diminution of light in this case which made the house less habitable—that used any serious inconvenience. There was another point he relied upon, and that was the angle of 45 degrees. The angle of 45 degrees had been adopted as a rough test, and both Lord Byles and Lindley, following Lord Selborne, appeared to think that, assuming other things to be equal, an angle of 45 degrees of light coming to the window of a plaintiff was all that he or she was entitled to. Mr. Edward Charles Monson, an architect, as called, and stated that he had prepared plans in the case. With regard to the light to the windows complained of, he found that the plaintiff's drawing-room window had been unobstructed to the angle of 45 degrees down to the grass line. The morning-room had over 45 degrees of unobstructed light. Witness applied the test of reading in the drawing-room about mid-day on November 7, and he could read in all parts of the room, and even with the blinds down. The same test was applied in the morning-room, and with the same results. In his opinion, the building of the defendant's house had not interfered with the comfortable enjoyment of the plaintiff's use.

Cross-examined, He was of opinion that the value of plaintiff's house had not diminished at all by reason of the defendant's building. He really thought that the value of the plaintiff's house had been enhanced by reason of having alongside it such a handsome and comfortable house. In answer to his lordship's witness said he did not deny that there was some obstruction to the light of the plaintiff's living-room window.

Mr. L. R. Vigers, surveyor, also gave evidence to the effect that, although the defendant's building had obstructed some of the light formerly coming to the plaintiff's rooms, there was a sufficiency of light for all ordinary purposes.

Mr. E. B. P'Anson and Mr. E. Monson, architects, also gave evidence on behalf of a defendant.

At the close of the evidence Mr. Stewart Smith addressed his lordship, contending that a decision of the House of Lords in the case of the Home and Colonial Stores v. Colls reversed this case, and that judgment should be for the defendant.

Mr. Justice Kekewich said that the decision of the House of Lords in that case had created a large number of judges, including himself, as regarded some misconception as to a law relating to ancient lights. He should go no further than that with Mr. Stewart Smith's contention.

was adopted, the other side were unable to agree to that being done.

His lordship: Of course they are entitled to thrash the matter out in their own way.

Mr. Stewart Smith, K.C., said his real difficulty was this:—If the surveyor gave an opinion, there would be no means of testing the grounds upon which he gave it, and it might be very important, if the case was discussed elsewhere, to ascertain the grounds upon which any damage was alleged.

His lordship: Very well, you must deal with it in your own way, but I cannot help thinking you are very foolish.

Mr. Lawrence: The only question remaining is when will it be convenient for your lordship to go on with the case.

His lordship: I will take it to-morrow week, and fix nothing else for that day.

EMPLOYERS' LIABILITY ACT: QUESTION AS TO PACKING AND FENCING SAW BENCHES.

AT the Marylebone County Court on the 11th inst., before Judge Stonor, George Smith, a builder's machinist, 2, Chichester-road, Kilburn, N.W., brought an action, under the Employers' Liability Act, against Mr. William Giles, builder and contractor, Macroom-road, Paddington, W. The plaintiff claimed 423s. damages, in respect of personal injuries, alleged to have been caused owing to negligence on the part of the defendant or his servant or servants.

Mr. E. Abinger, counsel, appeared for the plaintiff, and Mr. W. Shakespeare, counsel, for the defence.

Plaintiff's counsel stated that his client had been in the defendant's employ, and met with the accident in question while engaged in cutting rebates in long window sills, by means of a large circular saw. The cut was required to be 5 in. deep, but the only available saws on the job were one 13 in., and another, 28 in., in diameter. The former was too small for the work, while the latter, even when the bed of the bench was raised to its full extent, left the saw 7 in. above the bench. He asked the foreman what was to be done, and was told to "pack" the bench 2 in., so that the saw would cut only 5 in. deep. Under the supervision of the foreman the bench was so packed, and the foreman assisted in pulling the sills through the machine. They had just finished one of the cuts when the strip of wood slipped off the packing-piece. The plaintiff was in the act of replacing the strip when, it appeared, the length was raised, and three fingers of the man's left hand were caught by the saw and completely cut off. Counsel said his case would be that, although the plant might have been perfect in itself, it was defective, by reason of the packing being required, and he also contended that there was negligence on the part of the defendant in not providing a guard or fence for the bench.

Medical evidence having been given as to the man's injuries,

The plaintiff bore out counsel's opening statement. He added that he had had some twenty-one years' experience in the trade. There was a "hood" above the bench, but this left the saw quite "naked." It was usual in the trade to have several different sized saws in the shop.

In cross-examination, the plaintiff said it was not customary in the trade to use packing, either on rising and falling benches or those with a fixed bed. If, however, packing were used, it was usual for the machinist to select and arrange it himself. The foreman on the job in question was not a machinist, and he (plaintiff) arranged the packing. Prior to the accident he told the foreman that a smaller saw would be required, and the foreman promised to get one suitable for the job.

George Bartlett, builder's machinist, said he had had about thirty-five years' experience in the trade. Witness maintained that at least half a dozen saws of different sizes should be kept for such work, and that all circular saws should have guards upon them.

William George Watson said that he had had about seventeen years' experience as a machinist, and that of late years it had been the custom to use guards on saw benches.

For the defence, Mr. Walter Fish, of the firm of Fish and Son, builders' machinists, Curtain-road, E., said he had had about thirty-five years' experience in the business. For the work in question he did not consider that a guard was necessary, because the top of the saw was completely embedded in the wood until the cut was made, and then the machinist had no need to touch the wood.

Cross-examined, witness said that the object of the rising and falling bench was to obviate the necessity for packing.

Mr. Stanley F. Prest, engineer, Suffolk-lane, Cannon-street, E.C., said that, when visiting shops on the continent, in America, and also

in this country, he had found that there was no invariable practice in the trade as regarded the use of the guards. All guards to circular saws were more or less modern inventions, and a guard for fixing at the back of the saw—like one produced—was one of the latest developments of the invention.

Counsel for the defence submitted that an employer was not bound to look out for and adopt every fresh invention for the safety of his men, such as the guards in question, and that the omission of the defendant to provide such a guard did not amount to negligence within the meaning of the Act, but only meant that he had not adopted one of the latest improvements. Counsel also pointed out that there was no evidence as to the plaintiff having complained about the absence of a guard.

Counsel for the plaintiff said he did not suggest that an employer should adopt every new contrivance for use in his work, but he submitted that employers were under the legal obligation of using all ordinary precautions for the safety of their men, and that the defendant in the present instance had failed to do so.

The judge said that, in view of the extremely important questions raised by this most difficult case, he must take time to consider his decision.

PAVING APPORTIONMENT DISPUTE.

THE case of Scott v. the Investors' Property Corporation came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Kennedy and Phillimore, on the 12th inst., on a case stated by the magistrate of the North London Police Court on a point of law under the Metropolitan Local Management Act, 1855.

The case stated that Scott was a paving rate collector to the Hackney Borough Council, which was the paving authority for the district. The respondents were the owners of No. 22, Tyssen-street. In July, 1903, the Council resolved to make up and pave Tyssen-street as a new street, and an apportionment was duly made, the sum of 26s. 9s. being apportioned upon the respondents. The street adjoined the North London Railway. The respondents were taken to recover the amount.

The part of Tyssen-street in question is situated on the south side of the railway, to which it runs parallel. The north side of the street was supported by a retaining wall abutting on the railway, which is 9 ft. below the level of the street. Before 1880, when the houses were erected, the site occupied by the street was surplus land belonging to the railway company, who sold to the respondents' predecessors-in-title, and they filled up the land and got the permission of the Metropolitan Board of Works to lay out Tyssen-street as a new street 20 ft. in width. The houses were then erected, including the one in question, of which the respondents were the occupiers for the residue of a term of ninety-nine years. No part of the wall was included in any of the leases of the houses abutting on the street. No sun had been apportioned in respect of the retaining wall. At the hearing it was contended, on behalf of the respondents, that their predecessors-in-title were the owners within the meaning of section 250 of the Metropolitan Local Management Act, 1855, of the retaining wall, and that the apportionment was bad by reason of the omission to apportion on them any part of the cost of paving the street. For the appellants it was contended (a) that the land did not abut on the street, by reason of its being at a lower level; (b) that the land on which the retaining wall was built, not being capable of producing a rack-rent, was *extra commercium*; and (c) that the wall, having been built with the object of supporting the highway and being essential to the user thereof, and the highway having been dedicated to the public, the wall was part of the road, and vested in the appellants as the highway authority, and the predecessors-in-title of the respondents had no longer any beneficial ownership in it. The learned magistrate was of opinion that the ownership of the land on which the retaining wall was built remained vested in the respondents' predecessors-in-title, and that the land on which the street was made, having been artificially raised, the contention that the land belonging to the said predecessors-in-title did not abut on the street, by reason of its being at a lower level, was not maintainable. He also held that there was no evidence before him to show that the land and wall had become vested in the appellants as the highway authority. He further held that the land and wall thereon were not incapable of commanding a rental, and that the case fell within the principle of Williams v. the Wandsworth Board of Works, and he therefore dismissed the summons. Hence the

present appeal, the question being whether the magistrate's determination was right in point of law.

Mr. Horace Avory, K.C., appeared for the appellants, and Mr. Macmoran, K.C., and Mr. C. Glen for the respondents.

At the conclusion of the arguments the court dismissed the appeal, holding that the decision in *Williams v. the Wandsworth Board of Works* governed the point in question.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

13,835 of 1903.—R. STANLEY and STANLEY BROS., LTD.: *Waste Fittings for Sinks.*

This invention relates to waste fittings for sinks, the object being to provide a waste plug which fits perfectly tightly in the waste hole without the aid of cement, or the like, and which is capable of being removed at any moment for the purpose of cleansing or for any other object. The invention also enables the gully to be easily detached, the same being held up against the sink bottom by the waste plug, or a projection thereof, and connected by a Stanford or other non-prominent joint with the waste pipe. According to the invention the hollow waste plug carries a threaded nozzle which projects downwards, and engages with a corresponding thread inside the top of the gully. Should the latter be made of stoneware, the thread will be round, and of a quick type, but a cast-iron gully may sometimes be used, in which case, the thread, although preferably a fast one, would be smaller. Before applying the plug, the seating connecting the mouth of the waste hole is provided with a rubber or other water-tight ring.

16,072 of 1903.—J. G. SHIDDER: *Jointed Connections between the Flush and Discharge Pipes to Closets and other Arms and Outlets for same.*

Connections between the new and old work for flush or discharge pipes for closets, lavatories, and the like, comprising a rubber ring having wedge-shaped elevation with scarfed joint, a metal staple passing through two holes, one in each side of scarf so as to secure the ring in position on the pipe or arm ready to receive a metal back ring with wedged and beaded projections made in two parts, with jointing lugs and screws, and two or more slotted arms made on this ring for the bolts to pass into, a metal expanding ring, provided to pass round the arms or pipes, with hooked eye-bolts and nuts for securing the same into position. On this ring two or more loose eye-bolts are fixed, which pass into the slotted lugs on back ring, when these nuts are screwed up the scarf rubber ring is forced into position, thus making a water or air-tight joint.

16,372 of 1903.—W. THOMSON: *Pulley Fittings for Carrying Sliding Doors, and the like.*

Pulley fittings for carrying sliding doors, and the like, consisting of a frame formed with two parallel bars, with projecting down end stop pieces, and having a transverse stop stay bar.

18,064 of 1903.—J. E. WILLIAMS: *Cement for Use in Repairing Retorts, and for like purposes.*

This invention has for its object to produce a fireproof cement, specially suitable for repairing retorts, crucibles, and other objects subject to very great heat. According to the invention the cement is made of the following material—viz., magnette, a species of iron ore, china clay, barytes, silicate of soda, and borax. The proportions are, by preference 25 per cent. of ore, to 75 per cent. of the remainder, the actual quantities of which latter may be, for example, 200 cwt. of china clay, 100 cwt. of barytes, 40 gallons of silicate of soda (100 twaddle), 24 gallons of water, and 25 lb. of borax. In making and using the cement the various materials are first well mixed together, and then applied to the object to be repaired in like manner to applying mortar to brickwork.

18,200 of 1903.—J. DANSETT: *Ceramic Tiles, Plates, Panels, and the like, and the Method of Manufacturing same.*

A method for the manufacture of trussed ceramic tiles, plates, and the like, in which metal network is placed vertically and centrally guided between revolving cylinders or gypsum, or the like, and the ceramic paste is fed by conveyors above the cylinders to each side of said network, so that on revolution of the cylinders the paste is caused to adhere to both sides of the network, the latter thus enclosed in the paste being guided on to an inclined path formed by closely-placed, freely-revolving rollers.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

21,654 of 1903.—D. DONE and C. BRAWN: *A Lock, Principally Applicable to Expanding or Collapsible Gates, used for Closing the Openings of Lifts, Shop Fronts, Gateways, and for other purposes.*

A lock for doorways, gateways, and other openings, consisting of a pivoted latch, or bolt, which is capable of engaging a stud or recess provided on one part of the opening to be closed, and which is capable of being turned back within the lock case, and retained therein when the gate or door has been opened.

24,331 of 1903.—D. M. BARNETT: *A Gauge and Scribing Tool.*

A scribing tool for carpenters, plasterers, and others, consisting of a number of wires, rods, or needles arranged parallel to each other within a holder or frame in combination with a presser plate; a metal bearing plate engaging therewith and having forked ends engaging with said bearings or supports of said frame; a pressure spring bearing upon said bearing plate and a set screw or its equivalent.

24,951 of 1903.—D. McLEAN: *Chimneys, and Means for Preventing Smoking.*

This consists in providing a chimney with one or more upwardly inclined outlet passages, having open ends and arranged in any convenient position between the top of the chimney and the fireplace from which the chimney extends.

26,007 of 1903.—W. BROTHERS: *Manufacture of Crystalline Gypsum, Applicable for Filling purposes.*

A process of preparing a loose crystalline mass of calcium sulphate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) known as pearl hardening satin finish, crystal finish, or by other name, from calcium sulphate, comprising the cooking or boiling of such calcium sulphate in the presence of water, or in an aqueous solution, cooling the crystals so formed before removing the water, and agitating the mass during the process of cooling, to cause such crystals to form or precipitate separately, and subsequently removing the water and drying them.

26,313 of 1903.—W. H. GLASER: *Adjustable Scale for Use with Scribing Blocks, and the like.*

An adjustable scale for use with scribing blocks, and the like, which consists essentially of a scale, mounted upon a base, and a plane-working surface, in such a way that relative motion is possible between the scale and the base, the divisions being parallel to the plane-working surface of the base; and the scale being furnished with an endless numbering band, arranged so that any selected numeral can be brought opposite to any selected main division of the scale.

9,992 of 1904.—W. J. EDLAND: *Windows or Casements.*

This relates to the construction of windows, casements, fanlights, skylights, and the like, with an outer frame and an inner or glass frame, said inner frame being hinged or otherwise suitably mounted on a cranked bar pivoted to the outer frame.

9,762 of 1903.—A. DREES and E. LIENSCH: *Pipe and like Joints, and Means for Securing the same.*

A packing for wrought-iron flanged or bell-mouthed pipes, having funnel-shaped enlarged sleeves, consisting in the combination of an internally suitably tapering or conical, or like shaped clamping, mounted on the tapering bell-mouth, with a clamp ring, mounted on the smooth end of the tube, and provided with an annular rib projecting towards the interior of the sleeve.

11,379 of 1904.—L. PARTI, G. KÁROLYI, and E. PARTZ: *Means for Generating Heat and Applying it for Useful Purposes.*

Means for generating heat by the addition of water, consisting of burned lime, to which are added either separately or in groups, potassium carbonate, magnesium carbonate, sodium phosphate, calcium phosphate, sodium nitrate, and sugar.

11,012 of 1904.—F. REHFUSS: *Ceiling Blocks.*

Ceiling stones, rhomboid or quadrate in form, having parallel abutments by means of which they are pushed, dovetailing into each other for the construction of flat ceilings, and also having one or more corners truncated.

11,738 of 1904.—T. JONES: *Construction of Panic Bolt for Doors.*

A panic bolt, adapted to retain single or double folding-doors in a closed position until pressure is applied on the side from which immediate ingress is required, consisting of a combination of a push element which is guided to slide normally to the surface of the door, to links extending in opposite directions, which links are pivoted to the push element, and two bolts, pivotally connected to

the side links, which bolts are guided to move in a line parallel to the surface of the door, and arranged to recede from, or approach one another, when actuated by the movement of the push element transmitted through the links, the relative situations and proportions of the parts being such that, in the outward extreme position of the push element, corresponding to the closed and fastened position of the door, the links are approximately in line with one another and nearly parallel to the line of motion of the bolts.

11,713 of 1904.—F. NORDMANN and F. SAUERLAND: *Water-closets.*

A water-closet ventilation, frost proof, and without stagnant water, characterised by the service pipe passing into a two-way valve, which, when the closet is used, automatically lets the water pass on to the cistern, and causes the water left between the two-way valve and the cistern to run off into the drain, so that every time the closet is used, the weight applied to and removed from the seat brings about the filling and the complete emptying of the pipes and cistern exposed to frost.

13,950 of 1903.—T. BRETHERTON: *Paving Blocks.*

A paving block, consisting of an iron casting resting on supports, and studded over on its upper surface with iron projections, and formed with dovetailed or toothed edges and perforations for wooden blocks, the whole being held together and filled up solid with a suitable filling material.

14,000 of 1903.—J. STEPHENSON: *A Building Block.*

A building block, made in accordance with this invention, is formed of two headers and two stretchers enclosing a central cavity or opening. The width of the block is equal to the thickness of the wall to be built, and the blocks may be provided with a spigot or projection at one end, and a socket or recess at the other, to interlock or bond with each other.

18,090 of 1903.—J. L. FERRELL: *Fireproofing Compounds, and the Art of Making the same.*

A process of making a fireproof compound, which consists in mixing with four parts of a 45 Baumé aqueous solution of sodium silicate, one part of a 24 Baumé aqueous solution of sodium chloride, and adding to said mixture one part of a 25 Baumé aqueous solution of sodium hydrate, and adding to such mixture sufficient water to reduce the same to 20 Baumé.

18,092 of 1903.—J. L. FERRELL: *Fireproofing Compounds, and the Art of Making the same.*

A process of making fireproofing compound, which consists in making an aqueous solution of aluminum sulphate, and mixing with said solution an organic acid capable of obviating the discoloring effect of said salt *per se* in the presence of iron.

19,534 of 1903.—G. H. WARREN and S. FONTAINE: *Construction of Storage Tanks, Bins, Silos, and the like.*

A storage tank, characterised by having an outer casing and an inner casing spaced apart, the inner casing being formed of fireproof bricks, having channels formed therein, plastic binding means arranged in said channels, binding bands embedded in the plastic binding means in the channels, and braces between the inner and outer casings.

6,825 of 1904.—D. D. McBEAN: *Sheet Piling for the Support of Excavations.*

A composite sheeting, comprising a plurality of similar rectangular timbers of varying lengths, secured edge to edge, the edges of the sheeting being provided respectively with a tongue and a groove, and the entering end or point of the sheeting being tapered across its width, and provided with inclined shoulders at one edge.

6,829 of 1904.—D. D. McBEAN: *Method of and Means for Forming Foundations for Cofferdams, and the like.*

This relates to excavation work, consisting in the combination of piles driven into the bed of the excavation, a frame supported upon the same, and having wallings serving as sheeting guides, series of piles in and along the banks of the excavation outside the sheeting walls, and sheeting-driver platforms mounted thereon.

7,756 of 1904.—H. SPATZ: *Manufacture of Fireproof Stone or Stoneware and Mortar.*

The manufacture of artificial stone or stoneware from finely-divided quartz, or other suitable silicious mineral, and a calcareous binding medium, adapted to form silicates of lime, which consists in using as a binding medium a mixture of the said calcareous substance with waste liquor obtained from the manufacture of chemical wood cellulose.

542 of 1904.—R. J. GODDARD: An Asphaltic Mosaic Flooring or Paving Composition. An asphaltic mosaic flooring or paving, consisting of a mixture of white asphalt, incorporated in a heated state with pieces of marble, limestone, spar, slag, or other suitable material.

580 of 1904.—N. R. GRIMM: Two-Story Tenements. A two-story tenement, having a basement or cellar, a light shaft accessible therefrom, a driveway leading from the basement or cellar to the second floor, and disposed partly in the light shaft and partly in the first floor, and cover for that portion of the stairway which is in the light shaft.

1,518 of 1904.—J. RUDIGER: Self-acting Flushing Cistern, with Periodical Discharge. A self-acting flushing cistern for the periodical discharge of water, comprising in combination a tank, a syphon vertically arranged in said tank, a vertical inflow branch at one end of the syphon provided with an opening for the escape of air, and a vertical outflow branch at the other end of the syphon, passing through the bottom of the tank, a narrow tube in the centre part of the syphon extending above the curvature of the same, an air escape in said narrow tube, and a narrow tube connecting the centre part of the syphon and the outflow branch.

1,565 of 1904.—J. DRAENERT: The Method for the Manufacture of Bricks, Building Blocks, and the Like, and Apparatus therefor. A method for the manufacture of bricks, building blocks, and the like, with strengthened edges and corners, in which a mould is first completely filled with suitable plastic material, hereupon the latter is compressed to a certain degree at the edges and corners of the mould by means of a frame-like stamp or die, the space thus produced in the mould by such compression being then again filled with plastic material, and subjected to a final compression.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

July 7.—By E. ROBINSON & Co. Arlesham—55 and 57, Burns-rd., ut. 89 yrs. g.r. 7. 3/4. w.r. 28. 1/2. 4/60

Illesden—43, Church-rd., ut. 65 yrs. g.r. 10. 10s. g.r. 55/.

By MADDOX, MILES, & MADDOX (at Bungay). Bungay, Suffolk.—A cowkeeper's and market-gardener's occupation, 7a, 2r. 19p., f. and c. 200

South Elmham-st., 30, Suffolk.—The Three Ashes Farm, 23a, 3r. 14p., f. 410

July 8.—By DAVID J. CHATTELL & SONS. Laleheath—Orchard-rd., "Branksia," ut. 92 yrs. g.r. 6/.

ennington—37, Hanover-gdns., ut. 41 yrs. g.r. 3r. yr. 35/.

By HAMPTON & SONS. Steyne—195, Lower Richmond-rd. (s.), ut. 79 1/2 yrs. g.r. 7/.

By JONES, LANG, & Co. ennington-gdns., f. p. 335

ammersmith—56, Biscay-rd., ut. 86 yrs. g.r. 3r. 10s., w.r. 40l. 6s. 300

By LOWE, GOLDSCHMIDT, & HOWLAND. Ford—Belgrave-rd., l.g.r. 14t. 14s., reversion in 98 1/2 yrs. 365

By C. C. & T. MOORE. Commercial-road East.—Ellen-st., the "Globe" p.h., freehold rental of 75l., reversion in 76 yrs. 1,810

ittfields.—Port-st., the "Gin and Tent" p.h., freehold rental of 75l., reversion in 32 1/2 yrs. 1,450

oydon.—Wilford-rd., l.g. rents 100l.; reversion in 55 yrs. 2,340

ting Hill.—Lattimer-rd., etc., l.g. rents, 16l. 16s., reversion in 43 yrs. 460

ethal Green.—Northampton-st., l.g.r. 140l., reversion in 15 yrs. 2,990

enor Park.—Romford-rd., l.g. rents 60l., reversion in 63 yrs. 1,810

Manor Park-rd., l.g.r. 35l., reversion in 63 yrs. 910

romley, Kent.—Hopk, l.g. rents 27l. 10s., ut. 42 yrs. g.r. nil. 425

olborn.—26, Red Lion-st. (s.), l.y. 75l. 1,760

By TRAFFORD & CARTER. mehouse.—1 to 4, William's-pl., f., w.r. 54l. 12s. 300

penry.—65, 97, and 99, Basing-st., f., w.r. 50l. 14s. 405

46, Copley-st., ut. 41 yrs. g.r. 3r. 10s., w.r. 33l. 16s. 205

By WAGSAPP & SONS. ackney.—70, 72, and 74, Chalkove-rd., ut. 69 1/2 yrs. g.r. 10l. 10s., w.r. 72l. 16s. 440

apton.—170, Rushmore-rd., ut. 62 1/2 yrs. g.r. 4l. 10s., w.r. 36l. 8s. 275

uly 6.—By Messrs. BALLS (at Braintree). listed, Essex.—Brook Ley meadows, 8 a. 1 r. 1 p. f. 120

"Kiln Field," 6 a. 0 r. 16 p., f. 120

ethersfield, Essex.—Freehold cottage and 29 a. 3 r. 20 p. 190

uly 7.—By J. E. WALTER (at Saxtilly). xtilly, Lincs.—Shop, slaughter house, blacksmith's shop, and 0 a. 1 r. 9 p., f., y.r. 22t. 18s. 460

Saxtilly, Lincs.—Two freehold cottages and 0 a. 1 r. 5 p. 280

Freehold house, shop, and 0 a. 1 r. 35 p. 480

House and 3 a. 0 r. 2 p., f. 1,600

Freehold farmhouse and 34 a. 0 r. 22 p. 1,070

Four enclosures of land, 10 a. 3 r. 30 p., f. 801

Five freehold building plots, 1,650

Saxtilly, Lincs.—Freehold farm, 2 a. 2 r. 9 p. 2,700

Broadholve, Notts.—Two freehold holdings, 123 a. 2 r. 12 p. f. 765

A freehold holding, 12 a. 3 r. 30 p. 450

July 8.—By G. B. HILLIARD & SON (at Chelmsford). Great Waltham, Essex.—"Old Shaws Farm," 41 a. 1 r. 38 p., f., p. 150

East Hanningfield, Essex.—"Dolphins" and 12 a. 3 r. 15 p., c. 1,800

Wickham Bishops, Essex.—A freehold estate, 61 a. 0 r. 32 p. 2,700

By SAWDYE & SON (at Barnstable). Yarncombe, Devon.—"Langley Barton Estate," 200 a. 1 r. 16 p., f. 4,025

"Rumsam Villa," f. 570

By W. BROWN & Co. (at Chesham). Hawridge, etc., Bucks.—"Hawridge Court Farm," 157 a. 3 r. 37 p., f. 2,550

8 enclosures, 38 a. 2 r. 31 p., f. 850

July 9.—By SPELMAN (at Norwich). Trunch, Norfolk.—The "New Inn" and 2 a. 1 r. 32 p., f. and c., y.r. 14l. 1,200

Part of the Brewery Field, 4 a. 2 r. 19 p., f. and c. 100

The "Blacksmiths' Close," 10 a. 1 r. 5 p., f. 275

North Walsham, Norfolk.—The "Royal Inn," f. Swardston, Norfolk.—Three copyhold cottages and orchard, p. 180

By SALTER, SIMPSON & SONS (at Norwich). Spore, Norfolk.—"The Priory Farm" (including site of Old Benedictine Priory), 295 a. 0 r. 5 p., f. and c. 3,650

Stilbard, etc., Norfolk.—"Emery's," Lower Clifton, and "Littleburgh" farms (including brick works), 437 a. 2 r. 26 p., f. and c. 5,850

By T. W. GAZE & SON, with G. SYMONDS (at Norwich). Winfarthing, Norfolk.—"The Park Farm," 387 a. 2 r. 31 p., w. 8,500

Tibham, Norfolk.—"Pillgate-st. farm," 152 a. 0 r. 2 p., f. 2,500

July 11.—By BLAKE & CARPENTER. Kennington.—14 to 18, Shepherd's-pl., ut. 42 yrs. g.r. 25/.

By BUCKLAND & SONS. Bloomsbury.—6 and 7, Little White Lion-st. (s.), l., y.r. 120l. 2,000

By FIELD & BLADES. Bromley-by-Bow.—Bruce-rd., l.g.r. 43l. 6s., ut. 58 yrs. g.r. 11/.

Holloway.—Hilldrop-rd., l.g.r. 30l., ut. 49 yrs. g.r. nil 515

Camden Town.—Camden-rd., l.g. rents 50l., ut. 32 yrs. g.r. nil 800

Holloway.—Mittord-rd., l.g. rents 74l. 10s., ut. 246 yrs. (including long reversion) 765

Kingsdown-rd., l.g.r. 22l. 10s., ut. 246 yrs. g.r. 9l. 245

Barnsbury.—Grace-st., l.g. rents 80l., ut. 37 yrs. g.r. 16l. 900

Old Ford.—Applan-rd., l.g. rents 106l. 4s., ut. 60 yrs. g.r. 50l. 900

Romford, etc., l.g. rents, etc., 95l., ut. 60 yrs. g.r. 45l. 875

Nottling Hill.—Portland-rd., etc., l.g. rents 140l., ut. 18 1/2 yrs. g.r. 30l. 1,200

Shoreditch.—27 and 29, Bateman's-row (s.), ut. 51 1/2 yrs. g.r. 15l. y.r. 84l. 430

By WM. HOLLIS. Finchley.—Waverley-grove, nine freehold building sites. 1,480

By MULETT, BOOKER & Co. Hyde Park.—94, Westbourne-ter., ut. 33 1/2 yrs., g.r. 5l. p. 3,000

140, Westbourne-ter., with stable, ut. 43 yrs., g.r. 25l. y.r. 82l. 5s. 1,000

By RICHARDSON & HILL. Herne Hill, Kent.—"Pax's Field" (sand pit), 10 acres, f. 805

By STURT & STURT. Croydon.—97 to 119 (odd), Ventworth-rd., ut. 93 yrs. g.r. 48l. w.r. 250l. 1,830

Wimbledon.—17, Cromwell-road, ut. 84 1/2 yrs. g.r. 6l. 10s., e.r. 36l. 375

July 12.—By CHINNOCK, GALSWORTHY, & Co. Hyde Park.—Queen's-gdns., l.g. rents 90l., reversion in 49 yrs. 2,905

Queen's-gdns., l.g. rents 90l., reversion in 49 yrs. 2,975

By E. H. HENRY. Wandsworth.—5, Jephia-rd., ut. 79 1/2 yrs. g.r. 8l. 10s., w.r. 37l. 14s. 260

Sydenham.—58, Newlands-pk., ut. 76 yrs. g.r. 14l. e.r. 60l. 425

By J. C. PLATT. Hammersmith.—152, Hammersmith-rd., ut. 83 yrs. g.r. 6l. 16s. e.r. 80l. 770

Kennington.—84 and 86 St. Dunstan's-rd., ut. 85 1/2 yrs. g.r. 11l. w.r. 75l. 465

By ROGERS, CHAPMAN, & THOMAS. South Lambeth.—11 and 13, Meadow-rd., ut. 20 1/2 yrs. g.r. 6l. y.r. 68l. 490

Chelsea.—17, St. George's-st., ut. 15 yrs. g.r. 4l. 4s., y.r. 34l. 200

By BEADEL, WOOD, & Co. Tolleshunt Knights, Essex.—Enclosures of building land, 29 a. 2 r. 7 p., f. 850

Messing, Essex.—Enclosure of arable land, 8 a. 0 r. 20 p., f. 116

Enclosures of arable and pasture, 70 a. 3 r. 18 p., f. 510

Tolleshunt Knights, Essex.—"Brook Hall Farm," 275 a. 3 r. 5 p., f. 3,000

Tolleshunt Knights, Essex.—The Manor of Brook Hall, with fines, rents, royalties, etc. 370

Great Wigborough, Essex.—The Manor of Great Wigborough with Salcott, with fines, rents, royalties, etc. 5410

Steeple, Essex.—Two blocks of building land, 60 a. 0 r. 25 p., f. 500

A block of pasture land, 23 a. 2 r. 27 p., f. 105

Mallon, Essex.—"Brook Farm," also three enclosures of building and arable land, 53 a. 2 r. 19 p., f. 1,620

July 13.—By BLAKE & DANNATT. Dulwich.—39, Dunstan's-rd., f., w.r. 23l. 8s., 1 r. 3 a. and 5, Cornflower-ter., f., w.r. 62l. 8s. 675

Dunstan's-rd., freehold stabling premises and yard, y.r. 20l. 265

12, 14, 16, and 18, Forest Hill-rd. (s.), f., y.r. 17l. 2,590

Forest Hill-rd., the "Tavern," ut. 59 1/2 yrs. g.r. 12l. y.r. 100l. 1,410

Upland-rd., l.g. rents 26l. 5s., reversion in 75 yrs. 700

Chariton.—373, 375, and 422, Woolwich-rd., ut. 86 yrs. g.r. 14l. w.r. 106l. 12s. 675

Greenwich.—15, Queen-st., f., w.r. 14l. 6s. 105

Old Kent-road.—22, Upcott-rd. (s.), ut. 57 yrs. g.r. 2l. y.r. 26l. 215

By H. J. BROMLEY. Norwood.—14, Tennyson-rd., ut. 78 yrs. g.r. 15l. p. 700

By R. L. FREEMAN. Hampstead.—4, Dynham-rd., ut. 78 yrs. g.r. 6l. 10s., y.r. 45l. 430

By FRANK SWAIN. Kennington.—Tor-gdns., l.g. rents 35l., ut. 39 yrs. 630

By DOUGLAS, YOUNG & Co. Tooting.—7 to 12, Stanley-mansions (flats), f., y.r. 305l. 16s. 2,850

Brookley.—77, Manor-rd., ut. 59 yrs. g.r. 7l. 10s., y.r. 48l. 380

By WYATT & SON (at Chichester). Chidham, Sussex.—"Easton Farm," 82 a. 2 r. 12 p., f., y.r. 105l. 2,427

By N. EASTON & SON (at Hull). Sutton-on-Hull, Yorks.—A freehold farm, 62 1/2 acres, y.r. 122l. 3,300

By BOYTON, SONS, & BUCKMASTER (at Fulham). Fulham.—23 to 29 (odd), Protheroe-rd., ut. 73 yrs. g.r. 23l. w.r. 145l. 12s. 775

51, Rowland-rd., ut. 93 1/2 yrs. g.r. 4l. 41l. 305

By D. SMITH, SON, & OAKLEY (at Braintree). Braintree, Essex.—"Chapel" and "Vellinus" farms, 128 a. 0 r. 4 p., f. (in one lot) 2,100

July 14.—By B. R. BOSTOCK. West Ham.—47 to 53 (odd), Rokeby-st., ut. 65 1/2 yrs. g.r. 14l. w.r. 91l. 500

By WM. CLARKSON. East Ham.—28 to 38 (even), Becket-av., f., w.r. 124l. 16s. 1,080

1, 3, and 5, Aragon-rd., f., w.r. 94l. 12s. 730

By DEBESHAM, TEWSON, & Co. Stoke Newington.—42, Midway-grove, ut. 47 1/2 yrs. g.r. 6l. 10s., p. 400

7, Milton-rd., ut. 58 yrs. g.r. 6l. y.r. 36l. 310

1 to 4, Thomas-pl., ut. 14 yrs. g.r. 14l. w.r. 88l. 8s. 200

Islington.—25, Hallford-st., ut. 35 1/2 yrs. g.r. 6l. y.r. 30l. 230

Haggerston.—10, 12, and 14, Clarissa-st., ut. 15 1/2 yrs. g.r. 15l. w.r. 70l. 14s. 225

21 and 23, Clarissa-st., ut. 14 1/2 yrs. g.r. 6l. w.r. 52l. 150

Fulham.—61 to 67 (odd), Greyhound-rd., ut. 74 yrs. g.r. 24l. w.r. 135l. 4s. 800

Walthamstow.—81 to 87 (odd), Richings-ave., ut. 82 yrs. g.r. 16l. w.r. 79l. 6s. 370

By DRIVERS. Holloway.—424 to 434 (even), and 438, Hornsey-rd. (s.), f., y.r. 391l. 6,255

By FREDERBS. Brixton.—1 to 6, Sussex-dwellings (flats), ut. 62 yrs. g.r. 14l. w.r. 91l. 475

By HOLCOMBE, BETTS, & WEBB. South Kensington.—4, Clarendon-gate, ut. 15 yrs. g.r. 6l. 15s., y.r. 50l. 460

Wandsworth.—37, Ringford-rd., ut. 74 yrs. g.r. 6l. e.r. 34l. 320

By C. C. & T. MOORE. St. George's East.—12 to 18 (even), Ellen-st., 12a, 12 to 20 (even), Philip-st., 1 and 2, Mary Ann-st., area 8,000 ft., f., w.r. 340l. 16s. 3,550

20 to 38 (even), Ellen-st., area 8,400 ft., w.r. 323l. 14s. 3,230

1 to 11, Ellen-pl., 3 to 12, Mary Ann-st., area 15,300 ft., l., w.r. 564l. 4s. 5,880

40 and 42, Ellen-st., 2 to 12 (even), Stutfield-st., 13, 14 and 15, Mary Ann-st., area 7,450 ft., l., w.r. 237l. 6s. 2,810

16 to 29, Mary Ann-st., 15 to 23, Severn-st., 8 and 10, Philip-st., 14 and 16, Stutfield-st., area 17,300 ft., l., w.r. 861l. 7s. 8,470

1 to 14, Severn-st., 6, Philip-st., 19 to 35 (odd), Pineh-st., 18, 20, and 22, Stutfield-st., area 15,150 ft., l., w.r. 717l. 12s. 6,890

27 to 39 (odd), Christiana-st., 45 and 46, Ellen-st., 1 to 11 (odd), Stutfield-st., 1 to 4, Queen's-pl., area 9,400 ft., l., w.r. 522l. 12s. 4,450

By NEWBON, EDWARDS, & SHEPARD. Pimlico.—Charwood-pl., l.g.r. 48l., ut. 33 yrs. g.r. 9l. (with reversion) 790

Bessborough-st., l.g.r. 36l., ut. 33 yrs. g.r. 6l. (with reversion) 625

Lillingdon-st., l.g.r. 42l., ut. 29 yrs. g.r. 6l. (with reversion) 600

Poisonby-pl., l.g.r. 22l. 18s., ut. 30 yrs. g.r. 2l. (with reversion) 350

Camden Town.—160, Gt. College-st. (s.), ut. 7 1/2 yrs. g.r. 4l. y.r. 45l. 300

Somers Town.—57, Barclay-st., ut. 19 yrs. g.r. 4l. y.r. 32l. 180

24, Aldenham-st., ut. 16 yrs. g.r. 3l. 10s., y.r. 32l. 165

Pentonville.—47, 48, and 49, Warren-st., ut. 23 yrs. g.r. 12l. y.r. 96l. 480

Clapton.—103 to 109 (odd), Rushmore-rd., f., y.r. 120l. 1,810

Table listing various properties and their details, including addresses like Fulham, Hackney, and Islington, and agents like A. Prevost & Son.

Table titled 'BRICKS, &c. (continued)' listing items like One Side and two, Two Sides, and Splays with prices.

Table titled 'TILES (continued)' listing items like Do. Ornamental do, Hip tiles, and Valley tiles with prices.

MEETINGS.

FRIDAY, JULY 22. Institution of Heating and Ventilating Engineers.—The members will meet at the St. George Hotel at 10 o'clock and visit one of the Atlantic liners, lunching thereafter at the St. George Hotel at 1 o'clock.

PRICES CURRENT OF MATERIALS.

* * * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing various materials and their prices, including Bricks, Glazed Bricks, and Hard Stocks.

STONE.

Table listing various stone products and their prices, including Bath Stone, Portland Stone, and Aucaster in blocks.

SLATES.

Table listing various slate products and their prices, including 20 x 12 best blue Bangor and 20 x 10 first quality.

WOOD.

Table listing various wood products and their prices, including Deals, Battens, and Foreign Saw Boards.

JOISTS, GIRDERS, &c.

Table listing various joist and girder products and their prices, including Rolled Steel Joists and Common Bars.

METALS.

Table listing various metal products and their prices, including Staffordshire Crown Bars and Staffordshire Cast Iron.

TILES.

Table listing various tile products and their prices, including Best plain red roofing tiles and Best Broseley tiles.

METALS.—(continued). Per ton, in London. Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2ft. to 3 ft. by 20 g. 13 5 0 ... £ s. d.

LEAD, &c. Per ton, in London. Sheet, English, 3lb. and up 14 2 6 ... £ s. d.

ENGLISH SHEET GLASS IN CRATES. 2 oz. thirds 3d. per ft. delivered. 4 oz. thirds 3d. " " "

OILS, &c. Raw Linseed Oil in pipes per gallon 0 1 6 ... £ s. d.

VARNISHES, &c. Per gallon. Pale Oak Varnish 0 8 0 ... £ s. d.

TO CORRESPONDENTS. T. and F.—S. M. (Amounts should have been stated).—C. E. (Below our limit.)

TENDERS. Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. (N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor are lists in which the lowest Tender is under 100l., unless in some exceptional cases and for special reasons.)

ACOMB (York)—For erecting a villa residence, Carrlane, for Mr. W. M. Holmes. Mr. M. W. Lewis, architect and surveyor, 194, Bishopthorpe-road, York. Quantities by architect:— Bricklayer: H. Turner, Lawrence-street, York £243 16 0

ALLERTON.—For the erection of a detached residence, Mr. E. Hollis, engineer and architect, 11, Parkinson's-chambers, Husterigate, Bradford. Messrs. Phinca, Drake, & Sons, Allerton-road, Bradford. £2,100

ASHBY-BY-BRIGG (Lincolnshire).—For additions to elementary schools, for the Lindsey County Council Education Committee. Messrs. Scorer & Gamble, architects, Bank-street-chambers, Lincoln. Quantities by architect:— A. Watson, £2,233 0 0 W. Pallister £1,750 0 0

ASHBY PUERORUM.—For additions to Elementary School at Ashby Puerorum, near Horncastle, for the Lindsey County Council Education Committee. Messrs. Scorer & Gamble, architects, Bank-street-chambers, Lincoln. Quantities by architect:— K. Miller £156 10s 6d Hensman Bros., Horn-castle* £141

BLACKWOOD (Mon.).—For new Primitive Methodist Chapel, for the Trustees. Mr. R. L. Roberts, architect, Abercarn. Quantities by architect:— J. Dean & Son £1,437 12 0 E. Williams £1,175 0 0

BRAMFIELD.—For enlarging infants' room and building entrance porch and cloakroom, for the Managers of Bramfield (Non-provided) School. Mr. Arthur Pells, architect, Beccles. W. P.H.S. £220 W. Woodyard £212 0 0

KEASDEN.—For water supply works, for Settle Rural District Council. Mr. T. A. Foxcroft, Engineer and Surveyor, Town Hall, Settle:— Contract No. 1. Reservoirs and Pipe Laying, etc. Contract No. 2. Collecting Wells, etc.

KELLING.—For farm buildings, Kelling, Norfolk. Mr. T. Ingle Gollie, architect and surveyor, Bank House, Kelling, Norfolk. Messrs. J. W. Weston, £442 13 0 H. Bullen £295 0 0

LLANSTYLLIN (Oswestry).—For repairs, alterations, and additions to buildings at Ty-Tela, for the Town Surveyor, Guildhall, Oswestry. Quantities by Borough Engineer:— J. E. Morgan £294 9 6 J. Higgins, Oswestry* £137 0 0

LONDON.—For erecting an operating room, etc., at Infirmary, St. Dunstan's-road, Fulham Palace-road, W. for the Fulham Guardians. Mr. A. Saxon Snell, architect, 22, Southampton-buildings, Chancery-lane, W.C. Quantities by Mr. W. T. Patten:— C. Deering & Son £1,350 0 0 Mattock & Par-cowley & Drake £1,173 16s 6d

LONDON.—For extensions to the Town Hall, Horwood-road, Fulham, for the Borough Council. Mr. Francis Wood, Borough Engineer, Town Hall, Fulham. Quantities by Mr. T. Woodbridge Biggs, 10, Clifford's-tun, Temple Bar, E.C.:— F. G. Minter, Ferry Works, Putney* £22,172

LONDON.—For Magirus' turntable long ladders, for the London County Council:— J. Morris & Sons* £675

LONDON.—For the reconstruction of the bridge carrying Kingsland-road over the North London Railway near Dalston Junction, for the London County Council:— Padrette & Co. £14,250 0 0

LONDON.—For 1,000 hydrant indicator tablets, for the London County Council:— S. Pontifex & Co.* £120

LONDON.—For the renewal of the gearing of the penstocks at the outlets of the Essex-street, Norfolk-street, and Savoy-street sewers into the River Thames, for the London County Council:— Goddard, Massey, & Warner £252 14 6

LONDON.—For the supply and fixing of cases on hauldrails in a portion of the south gallery of the Horutman Museum, for the London County Council:— W. Ford & Co.* £117 7 0

LONDON.—For the execution of certain works at No. 18, Lancing-street, St. Pancras, for the London County Council:— R. Harding & Sons, £400 T. Laphorne & Co., Barlow & Roberts 310 London* £269

LONDON.—For provision of additional electric cables, for the London County Council:— The British Insulated and Helsby Cables, Ltd., at prices 7 1/2 per cent. above those specified in the contract entered into with the company.*

LONDON.—For works at Eagle Wharf, Narrow-street, for the Stepney Borough Council:— Parrot & Isom £1,537 17 6 Harris & F. & F. Wood 1,185 0 0 Wardrop £1,065 0 0

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Teniers to be delivered. Includes various construction contracts such as 'Inishing Union Infirmary', 'Building Torr Bdge, Yealton & Newton Patters', etc.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Lists appointments such as 'Assistant Electrical Engineer', 'Assistant Town Treasurer', etc.

Those marked with an asterisk (*) are advertised in this Number. Competitions, iv. Contracts, iv. vi. viii. x. Public Appointments, xvii. xix.

TENDERS.—Continued from page 107.

ONDON.—For the erection of the superstructure of first portion of the Greenwich generating station, erection of the pump-house, etc., for the London City Council.— Messrs. H. Lovatt, Ltd., at a reduction of 1/4 per cent. on the schedule rates, under their existing contract with the Council.

LONDON.—Alterations to No. 41, Kingsland-road, Shoreditch, N.E., for Messrs. Thos. Eaton & Co. Mr. John Jas. Downes, architect, 199, Lewisham High-road, S.E.:— W. O. Collingwood... £547 | R. Schooley & Son*... £511

LONDON EDUCATION COMMITTEE TENDERS. For painting or cleaning schools during the summer holidays, 1904.— City of London, Great-lane (Cleaning Interior). G. Barker... £223 10 | J. Appleby & Sons £183 0

Fulham, St. Dunstan's-road (Cleaning Interior of Main School and Painting Interior and Exterior of Special School). W. Hammond... £674 | Lathey Bros. £375

Additional tender notices and company information at the bottom of the page, including 'North Lambeth, Addington-street' and 'North Paddington, Amberley-road'.

LONDON EDUCATION COMMITTEE—continued—
Norwood, Jessop-road (Painting Exterior).

T. Freeman	£225 0	J. F. Ford	£105 0
H. Lewis & Son	188 0	Maxwell Bros.,	
H. C. Crooks	130 0	Ltd.	104 0
W. V. Goad	121 10	W. J. Mitchell &	
W. Read	107 10	Son, Dulwich*	89 0

Wandsworth, "Eatonfield" (Iron Buildings) (Painting Interior and Exterior).

C. Gurling	£155 0	W. Johnson & Co.,	
R. A. Jewell	140 0	Ltd., Bellevue-	
E. D. Bull & Co.	122 0	road, Wandsw.	
R. S. Ronald	101 0	worth, S.W.*	£81 0
E. B. Tucker	97 13		

North Paddington, Campbell-street (Cleaning Interior of Old Portion and Painting Interior of Enlargement).

Thompson & Beveridge	£303 10 0
Marchant & Hirst	257 0 0
G. Foxley	248 11 6
F. Childley & Co.	228 15 0
F. T. Chicheen & Co., Harrow-road, Kensal-green, N.W.*	228 10 0

North Paddington, Esplanade-road (Painting Interior and Exterior).

General Builders, Ltd.	£597 0 0
Holloway Bros. (London), Ltd.	491 0 0
F. P. Chicheen & Co.	369 0 0
W. Champell	355 0 0
F. Childley & Co.	288 3 0
A. Balfour & Co.	271 14 0
Britow & Eastwell, 63A, Lancaster-road, W.*	257 0 0
Bermondsry, "Paragon" (Painting Interior and Exterior).	

W. King & Son	£673 0	J. R. Sims	£468 0
J. Appleby & Co.	534 0	E. Proctor & Co.	448 0
H. J. Williams	498 0	E. Triggs, 92, The	
W. Hayter & Son	479 10	Chase, Clapham,	
W. Sayer & Son	471 0	S.W.*	399 0

Rotherhithe, Rotherhithe New-road (Painting Interior).

H. Line	£495 0 0
W. J. Howie	393 0 0
W. Banks	390 0 0
E. Proctor & Son	388 0 0
W. Sayer & Son	364 10 0
E. Triggs	364 0 0
Holliday & Greenwood, Ltd., Loughborough-park, Brixton, S.W.*	335 0 0

N. Camberwell, Cradon-road (Drainage).

A. Porter*	£1,393
------------------	--------

MANFIELD.—For low-pressure hot-water heating apparatus in the Town Hall-buildings, for the Corporation. Mr. R. Frank Lawrence, Borough Surveyor, White Hart-chambers, Mansfield:—

Meadow Foundry Co., Mansfield*	£200
--------------------------------------	------

MIDDLE RASEN.—For additions to Elementary School at Middle Raseen, near Market Raseen, for the Lindsey County Council Education Committee. Messrs. Sworer & Gamble, architects, Bank-street-chambers, Lincoln. Quantities by architects:—

R. Ranvard	£190 2 6	Soupham & Sons	£158 0 0
E. M. Thompson	175 0 0	T. Sutton, Mar-	
G. Coles	164 0 0	ket Raseen*	152 16 1

MOUNTAIN ASH.—For erection of caretaker's house, Workmen's Institute. Mr. J. W. Miller, architect, Oxford-street, Mountain Ash:—

Jones Bros.	£405	F. Mills, Mountain	£400
		Ash*	

NANTWICH.—For erecting new schools in Welsh-row, for the Trustees of the Primitive Methodist Chapel. Mr. C. E. Davenport, engineer and architect, Nantw-ich:—

J. Read	£1,780	Proctor, Major, &	
F. Mathews	1,771	Mason	£1,468
G. H. Marshall	1,736	S. Manley	1,455
J. Harding	1,591	J. F. Hayward,	
Cox & Naught	1,587	Nantwich*	1,450

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PORTLAND.—For alterations and additions at the Grove Inn, for Messrs. J. Groves & Sons, Ltd. Mr. S. Jackson, architect and surveyor, Bridge-chambers, Weymouth:—

T. J. Stevens	£1,182 17 6	A. J. Danford	
Hawkins Bros.	1,048 5 0	& Co., Wey-	
R. Lynham	997 10 0	mouth*	£910 0 0

RYE (Sussex).—For the erection on a stag, dressing-rooms, etc., at the Assembly Room of the "Cinque Ports" Hotel, for Messrs. Edwin Finn & Sons, Ltd., Lvd., Kent. Mr. Thurlow Finn, architect, Guildford, Surrey:—

W. J. Adcock	£762 0	Henry Knock,	
S. Harvey	752 10	Ashford, Kent*	£706 10
L. Edwards	750 0		

*Reduced to £597 11 10.

SHERINGHAM.—For residence, Hook's Hill-road, Sheringham. Mr. T. Inglis Giddie, architect and surveyor, Bank-buildings, Bank Plain, Norwich:—

Utting	£1,850 0 0	£89 15 0	£1,933 15 0
Girling & Smith	1,788 0 7	71 4 7	1,859 5 2
Riches	1,769 0 0	84 0 0	1,853 0 0
Blith	1,752 2 7	58 5 0	1,810 8 1
Buller	1,740 0 0	79 0 0	1,819 0 0

SURBITON.—For making a new road between Brighton and Glenbuck roads, for the Urban District Council. Mr. Samuel Mather, Assoc. M. in L.C.E., Engineer and Surveyor to the Council:—

F. J. Coxhead	£1,270 0 0	O. F. Gibbon:	£1,075 0 0
Cunningham, Forbes, & Co.	1,150 0 0	Kavanaugh & Co., Sur-	
L. Free & Sons	1,144 11 8	biton*	1,022 15 4

[Surveyor's estimate, £1,089 9d. 11d.]

TWICKENHAM.—For paving with cross-set cal- blacks portions of the carazeway in Richmond-road, King-street, and London-road, for the Urban District Council. Mr. P. W. Pearce, Surveyor, Town Hall, Twickenham:—

Mowlem & Co., Westminster*	Schedule prices.
----------------------------------	------------------

WEST HARTLEPOOL.—For alterations to Wesleyan School, Avenue-road, for the Education Committee. Mr. H. Barnes, architect, Bank Chambers, Scarborough-street, West Hartlepool:—

Mr. E. M. Tweedle, West Hartlepool*	£1,350
---	--------

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ILLUSTRATIONS.

Sculpture: "Nympe à la Source" M. H. L. Levasseur, Sculptor.
 Sculpture: "Extase de l'Infini" M. Gustave Michel, Sculptor.
 New Crematorium, Sheffield Messrs. C. Hadfield and C. M. Hadfield, Architects.
 Sheffield Childrens' Convalescent Home, Holmesfield Mr. H. L. Paterson, A.R.I.B.A., Architect.
 Residence at Windermere Mr. T. H. Mawson, Hon.A.R.I.B.A., Architect.
 Blythwood Dairy, Stanstead, Essex Mr. W. D. Caroe, F.R.I.B.A., Architect.


Illustration in Text.

Sheffield Poor Childrens' Holiday and Convalescent Home, Holmesfield. Plans Page 126

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Iron and Steel.

OME interesting figures are to be found in the annual return, issued last week as a House of Commons paper, relative to the production and consumption of iron and pig iron and the production of steel in the United Kingdom and the principal foreign countries. In this particular instance "the imports and exports of certain classes of iron and steel manufactures" have been included. Most of the figures are given only to the end of the year 1902, but the imports and exports are carried on to 1903. The statistics to which we refer demonstrate striking advances made in the production of iron ore by various countries. During 1902 the quantity of iron ore mined by the United Kingdom and Germany increased by more than one million tons in each case, while the output of the United States exhibited a rise of nearly seven million tons. So far as can be judged by the returns for 1903, it appears that the United Kingdom has advanced by about 300,000 tons, and Germany by 3,000,000 tons, while the United States has lost ground by nearly 900,000 tons. Other facts worthy of note are that the output of Sweden has increased threefold since 1891, and that one-third of the ore used by the iron and steel manufacturers of this country is imported from abroad. Even the most

cursorious view of the foregoing statistics is sufficient to indicate that our position is anything but satisfactory.

We will now turn to the figures relating to pig-iron, which show that, comparing the years 1901 and 1902, the production in the United Kingdom and Germany was greater in each case by about three-quarters of a million tons, while in the United States there was an upward bound of nearly 2,000,000 tons. From the preliminary figures given for 1903 it appears that there has been little movement in the production of this country and the United States, but that an increase of 1,500,000 tons has been effected in Germany, thus placing that

From this statement, it is clear that the United Kingdom, having been long since surpassed by the United States, is now definitely relegated to the third place among the nations, so far as the production of pig-iron is concerned. What the future may bring forth we do not predict, but there seems to be little ground for hope in the statistics here quoted.

With regard to steel, the position is even more unsatisfactory, in spite of the fact that in 1903 the production amounted for the first time to more than 5,000,000 tons. The following is a statement of the production for the leading countries during the years 1900 to 1903:—

Country.	Total Production (in Thousand Tons).			
	1900.	1901.	1902.	1903.
United States	10,188	13,474	14,947	Not known.
Germany	6,261	6,107	7,302	8,660
United Kingdom	4,901	4,904	4,849	5,034

country for the first time in front of the United Kingdom. The figures for the three countries during the period 1900-1903 are stated below, the records for other countries, being individually of comparatively little importance, are not included in the table.

It will now be instructive to supplement the foregoing statistics with others dating back to the year 1876, so that we may be in a position to judge more accurately the developments that have taken place during the last quarter of a century. As a matter of convenience

Country.	Total Production (in Thousand Ton).			
	1900.	1901.	1902.	1903.
United States	13,789	15,878	17,821	18,009
United Kingdom	8,960	7,929	8,680	8,811
Germany	8,370	7,740	8,381	9,860

we take the figures from the Report of the Tariff Commission issued last week. The data therein given are based on British and foreign official returns, and therefore may be accepted as authoritative. The following table gives the average annual production for the three leading countries and for the whole world between 1876 and 1903.

AVERAGE ANNUAL PRODUCTION OF PIG-IRON (IN THOUSAND TONS).

Period.	United Kingdom.	Germany.	United States.	All Countries.
1876-80	6,660	2,140	2,200	14,810
1881-85	8,100	3,340	4,260	20,100
1886-90	7,760	4,130	7,080	23,640
1891-95	7,040	4,990	8,130	26,210
1896-1900	8,890	7,310	11,490	35,590
1901	7,930	7,740	15,880	40,230
1902	8,680	8,260	17,820	43,840
1903	8,810	9,850	18,000	47,340

Examination of this table shows that at the end of the seventies the total amount of pig-iron produced in this country was about 55 per cent. more than the combined output of Germany and the United States, and nearly half the total output of the world. At the end of the eighties the production of the United Kingdom was little more than that of the United States, only two-thirds that of the two next countries, and less than one-third that of the world. In other words, the output of pig-iron had increased by only 17 per cent., while the output of Germany and the United States had increased by 93 per cent. and 175 per cent., respectively.

Early in the nineties the United Kingdom lost the premier position, and the United States took the first place, while, more recently, Germany has usurped the second place. In 1903 the output of the United States was nearly equal to the combined output of Germany and the United Kingdom, and approached almost to two-fifths of the entire production of the world, while the output of this country was less than one-fifth of the total production of the world. Further, it is evident that in the United Kingdom the production of pig-iron has been almost stationary, and has in fact done no more than keep pace with the growth of population, while the reverse has been the case in Germany and the United States.

Turning next to the case of steel, we have the following data:—

AVERAGE ANNUAL PRODUCTION OF STEEL (IN THOUSAND TONS).

Period.	United Kingdom.	United States.	Germany.	All Countries.
1876-80	1,020	810	510	3,060
1881-85	1,970	1,850	1,070	5,880
1886-90	3,270	3,290	1,790	10,630
1891-95	3,080	4,670	2,780	13,070
1896-1900	4,660	8,450	5,620	23,250
1901	4,900	13,470	6,290	30,530
1902	4,850	14,940	7,650	35,890
1903	5,030	(not known)	8,700	(not known)

Consideration of these figures makes clear some very striking facts. Thus, in the seventies the production of steel in this country was one-third that of the entire world, while at the present time it is less than one-seventh. Notwithstanding the largely increased demand for steel, production remains almost stationary so far as the United Kingdom is concerned, while the production of other countries has advanced by leaps and bounds.

We refrain from adducing other figures, because those already given are sufficient to indicate the eminently unsatisfactory condition of the British iron and steel industries. The whole subject is one that deserves the most earnest consideration from a national standpoint, without political bias of any kind. In the recent report of the Tariff Com-

mission our readers will find an immense and invaluable collection of facts, furnished by men who are practically engaged in the manufacture of iron and steel, and whose opinions have been solicited without regard to their political creeds. The Commission is in no way political, and it includes members representing all shades of opinion. It was established for the purpose of obtaining facts which could only be secured by the consent, approval, and assistance of all branches of the iron and steel trades in the country. The information so elicited is presented in the form of a voluminous appendix to the report, to which we can make only a few brief references.

The relative decadence of the British iron and steel industries appears to be further confirmed by the replies received in answer to inquiry forms supplied by the Commission. There is a fairly general consensus of opinion as to the severity of foreign competition in the home market, the progressive substitution of foreign for British-made materials, the loss of foreign markets, and the increase of foreign competition in British dominions across the seas. It was but natural that foreign countries, possessing the raw materials in abundance, should commence the manufacture of iron and steel, and that they should adopt the methods of production first established in the United Kingdom. Foreign countries have made it their business to foster national industries and to secure their home markets, from which British pro-

ducts have been virtually excluded. During recent years their policy has been to capture the home, colonial, and foreign trade of the United Kingdom, and evidence before the Tariff Commission indicates clearly that this country is merely at the beginning of foreign competition, which is likely to become more and more severe as time goes by.

Various reasons have been suggested for the relative decline of the iron and steel industry. These we will now con-

sider in the light of information afforded by manufacturers.

One natural disadvantage is that a proportion of the ore required has to be imported from other countries. The evidence of witnesses shows, however, that the adequate supply of iron is largely a matter of organisation, and in respect of distance the United Kingdom is under no disadvantage as compared with her most formidable competitor, and that the coal supply is fully equal to that of any other country in the world. The evidence tendered to the Commission leads to the conclusion that no natural conditions have been sufficient to account in any way for the loss of supremacy which has taken place.

With regard to the question of technical education, the conclusion to be drawn from the evidence is that, including under technical and higher education thorough training in the policy and methods of organisation of foreign countries, the British iron and steel trades have suffered somewhat from the lack of instruction in such subjects, though not to such an extent as to account materially for the ground lost. It is shown, further, that in the higher branches of the industries, where scientific training is most important, British manufacturers are efficiently served. Nevertheless, we are of opinion that the many excellent institutions already existing should be further extended and supplemented by new educational agencies, particularly of the types that have been so admirably described in the reports of Dr. Rose, British Consul-General in Stuttgart. Among other causes detrimental to the British manufacturer are the heavy burdens of local rates, the cost of labour, and excessive rates charged for transport. None of these, however, appear adequate to account for the demoralisation which has marked recent years. Numerous witnesses believe that the difficulties which the British iron and steel trades suffer are chiefly due to the organisation and policy of foreign countries combined with the system of free importation.

All the manufacturers examined placed particular emphasis on the importance of continuous operation and large output as the best means of securing the lowest cost. As typical examples of economy, the following are selected from the evidence of witnesses:—

(a) The saving in the production of steel from pig-iron due to increased output is shown by the figures for two periods, one of which the average production was 2,293 tons and in the other 10,630 tons. The saving in wages, coal, and general charges amounted to £1,000 per ton, equivalent to a total saving of about 45,000*l.* a year.

(b) In the case of another steel works the difference of cost at full work was half work—taking into account the cost of pig-iron, and other materials, as well as depreciation and all charges—represented the following savings:—on 15s. 6d. per ton, on bars 22s. per ton, and on plates 32s. per ton.

Costs vary week by week and month by month, according to the output, but many witnesses have stated their opinion that, under equal conditions of Free Trade or Tariff, British iron

urers could hold their own with any competitor. The necessity for working short time is, in their opinion, the most severe circumstance which has to be encountered. These witnesses state that foreign countries, and particularly Germany and the United States, have not only grasped the truth of this proposition, but have made it the basis of their export organisations. Such organisations are effected (1) to the control of home markets by protective tariffs, (2) to the granting of preferential export rates by land and water, and (3) to the establishment of trusts and kartels, intended to govern the operations of different industries on a broad and comprehensive scale, to secure home markets, and to foster export trade.

These three causes combine to deprive British iron and steel manufacturers of work which would enable them to reduce the cost of production by keeping their works fully and continuously employed. Foreign systems are skillfully designed and ably administered, not only for the benefit of foreign manufacturers in the home markets, but are stretched in every available way against British manufacturers who have to fight tariff walls abroad and unfairly reduced prices at home.

The manner in which unfair prices are secured in the United Kingdom is by the practice of what is known as "dumping," involving a most efficient organisation for securing maximum output and continuous running, foreign countries, by producing iron and steel at the minimum cost, and keeping up prices at home, can afford to deliver the surplus to the British market at any price it will fetch. In the opinion of numerous witnesses examined by the Tariff Commission, the openness of the British iron and steel industry to attacks of this nature is the principal cause of its existence. As illustrations we quote the following examples:—(a)

February last German steel joists were offered in Antwerp for shipment at 80s. 6d. per ton, the estimated net cost being 90s. 6d. per ton. (b) American iron sections, costing at least 81s. 2d. per ton at Pittsburg, were being offered at any British port at 75s. per ton. It may be thought that if foreigners are allowed to lose 10s. or more per ton on their goods, they are very foolish. But they are not really so, as profit is actually made, so long as the export sales amount to less than fifty-nine per cent. of the total output. By means of protective tariffs and the operation of trusts and kartels, the home price in Germany is maintained at 105s. per ton. Hence, 10 tons be sold at 105s. and 59 tons at 80s. 6d., the average price is just equal to the cost of 90s. 6d. per ton; and if the exports be limited to 50 per cent. of the total output, the average price is 92s. 9d. per ton.

The ability of the foreigner to make profit, actually to increase profits by "dumping," is proved by the evidence of a British firm. Last year they produced 1,000 tons of steel at a cost of 95s. per ton. Selling this at an average price of 105s. per ton, their profit was 28,500*l.* If fully employed, the same works would have turned out 152,000 tons, the cost would have been reduced to

90s. per ton. If the extra production of 38,000 tons had been sold at the cost price of 90s. per ton, the profits of the firm would have been increased to 57,000*l.*, owing to the all-round reduction upon cost of production. Thus the surplus of 38,000 tons could have been "dumped" upon any free foreign market, if there were one, at 15s. per ton less than cost, yet without involving any diminution of the original profit of 28,500*l.* This illustration serves to show the worldly wisdom of the foreigner, and indicates the permanence of "dumping" as part of an organised policy. To fight this is clearly the duty of those who are the natural guardians of the most important among British industries. It has already caused serious loss of employment, and brought about a feeling of insecurity throughout the iron and steel industries, which cannot be regarded as counterbalanced by the savings secured by individual buyers of dumped products.

For the evils to which we have directed attention there is one grand remedy, to which everyone in this country would agree—Universal Free Trade. But as foreign countries have deliberately established their tariff walls, for the express purpose of safeguarding native labour and of fostering national industries, they can scarcely be expected to expose these interests to the full force of British competition. Hence it is difficult to avoid recognising that there is some excuse for the contention raised by many iron and steel masters, that the present conditions can be best met by the establishment of an import tariff sufficient to prevent unfair competition on the part of foreign nations. The views of the Tariff Commission—formed after consideration of the evidence given by firms representing 87 per cent. of the persons employed in the iron and steel industries—are fully stated in the Report, where they may be examined at leisure by our readers.

In the appendix to this volume will be found much instructive matter beyond that already mentioned. It includes summaries of articles by Mr. Glier upon "Recent Developments in the United States Iron and Steel Industry," and of evidence before the "United States Industrial Commission on the Iron and Steel Industries," a memorandum on "The Organisation and Working of German Kartels," and a large number of statistical tables. It may be mentioned further that the summary of evidence given in the appendix includes 1,193 paragraphs, dealing with practically every point salient to the subject under investigation.

It would be impossible to over-estimate the value of the work done by this organisation, and whatever may be the political opinions of those who read it, we feel sure all will recognise the important service it has rendered to the nation at large.

SCHOOLS, LEICESTER. New schools, situated in Harrison-road, were opened at Leicester on the 18th inst. It is a one-storied building in two divisions, and is built on the principle of a large central hall, with classrooms round it. The walls are of Whitwick bricks, there is a tiled roof, and two large extraction towers. Mr. Edward Burgess was the architect, and the contractor, Mr. Charles Wright, of Leicester.

NOTES.

The Decoration of the House of Parliament.

THE painful subject of the decoration of the national palace of Legislature was brought up in the House of Lords on Monday by Lord Stanmore, who moved that a Select Committee be appointed "to inquire and report with respect to the unfinished condition of the rooms in the Palace of Westminster appropriated to the service of this House, and their approaches." Unfortunately, to the majority of English members of Parliament, the idea that rooms in a public building are "unfinished" because they have not received the artistic decorations once vainly intended, would not recommend itself as "practical." The temper of the House of Lords is more sympathetic in regard to art, but unhappily they have no control of the purse-string. Lord Stanmore drew a satirical picture of what the foreign visitor would see on entering the House through Westminster Hall: the empty niches, reserved forty years ago for the statues of Marlborough and Wellington, still vacant; the panels surrounded with stone mouldings intended as a framework for mosaic, but only inclosing spaces of blank paper; and so on. Lord Windsor, of course, could only express sympathy coupled with the conviction that it would be hopeless to approach the Treasury on the subject at present; it is always impossible "at present" to spend any money on art; but the future opportunity never arrives. In some other countries it would be considered a national discredit that the most important building in the country, after being up for more than half a century, was still wanting its highest class of artistic embellishment. In this country it is regarded as a trivial matter, and Lord Stanmore's motion was "negatived without a division."

Manchester Ship Canal.

ALL who desire the success of this great undertaking should be pleased to hear of any improvement calculated to encourage traffic. One of the most important proposals of the kind is represented by the project now before Parliament, which contemplates the deepening of the channel by 2 ft. for the whole distance between Manchester and the Mersey. This work is rendered necessary by the fact that many large vessels would be glad to use the waterway, but are at present prevented by reason of insufficient depth in the channel. Although the undertaking will be a costly one, it will result in certain gain to the company, and to those whose interests are more or less directly associated with the prosperity of the canal.

River Pollution.

WHILE recognising the difficulties encountered by local authorities in the important question of sewage disposal, we fear such bodies are not always sufficiently ready to rectify defects which have been clearly established and are known to be detrimental to health. The decision of the Stratford bench, given last week against the Walthamstow Urban District Council, comes as a useful reminder to local authorities that the mere discussion of

complaints, even if attended by the passing of a resolution, is somewhat unsatisfying and inefficacious. In this particular case, the Lee Conservancy Board, having had many complaints as to the pollution of the river, remonstrated with the District Council, and as long ago as 1902 suggested a scheme for taking the sewage right down to the Thames. The Council thereupon passed a resolution and waited further developments. These took the form of a summons for having allowed offensive matter to pass from the sewage farm into the Lea or its tributaries. After taking confirmatory evidence, the magistrates imposed a penalty, which, although comparatively small, should act as a useful stimulus.

Easements of Necessity.—The case of *Ray v. Hazeldine*, reported in the *Law Reports* for the current month, is one that owners of house property should note. The plaintiff was the purchaser of a house adjacent to another house which belonged to the vendor and was retained by him. In the wall of this latter house were two windows, that of a pantry and that of a lauding which overlooked the yard forming part of the premises conveyed to the plaintiff. Neither of these windows was an "ancient light," and no reservation of the right to the light had been inserted in the deed of conveyance to the plaintiff. The plaintiff erected a wall close to these windows completely blocking the access of light to them. The defendant took his own remedy and twice knocked the wall down from his own premises. The plaintiff then proceeded for a declaration that she was entitled to build the wall and for an injunction restraining the defendant from knocking it down, and succeeded, since the court held that, in the absence of any reservation of the easement of the light, the defendant could only succeed if an "easement of necessity" could be set up, and, by reference to former decisions, the court defined an "easement of necessity" to be not an easement without which the property could not reasonably be enjoyed, but one without which it could not be used at all. The learned judge held that this had not been proved, since there was no absolute necessity that the room should be used as a pantry, as it could be used for other purposes. There was evidence the pantry was rendered useless, but that light could be obtained elsewhere for the landings. It is to be observed that, had the "easement of necessity" been construed as one necessary for the reasonable enjoyment of the premises, little distinction would be made between such a case and one where there is a right to "ancient lights."

The Electrical Transmission of Power. It is highly probable that in the immediate future engineers will use very much higher pressures for the transmission of power than they have been employing hitherto, and thus great economies can be effected which will have an important effect on the industry. Ten years ago the pressure of 10,000 volts which the London Electric Company use to transmit electric power from their station at Deptford to the sub-station in Trafalgar-

square was regarded as being practically the extreme limit of the pressure at which it would be safe to work. Engineers now regard 10,000 volts as the normal pressure at which to transmit power. The electrical power, for example, required by the Metropolitan and District Railways and by the various tube railways now in course of construction in London is to be generated and transmitted at 11,000 volts. The cables used for the transmission are all sheathed with lead, and are drawn into cast-iron pipes, or are heavily sheathed with galvanised iron wire, so that the risk to workmen and employés is reduced to a minimum. As a matter of fact, double the pressure could be now safely used with cables and four times the pressure with overhead transmission wires. At Caffaro in the north of Italy the Oerlikon Company of Switzerland have installed plant for a 40,000-volt transmission line, which is now working successfully. Five 4,000-horse-power alternators are used, which produce three-phase currents at a pressure of 10,000 volts. This pressure is then raised to 40,000 volts by means of water-cooled oil transformers, the transformation being effected at a loss of less than 1½ per cent. of the power transmitted. Pressures higher than this are in use in America, and engineers have now plenty of data in connexion with the working of these very high pressure transmission lines. At one time it was thought that the losses would be excessive, as the transmission lines have a faint phosphorescent appearance at night-time and brush discharges take place if there are any sharp edges on the wires. These losses, however, can barely be measured. The Oerlikon Company have transmitted power to their own works for about three years at a pressure of 30,000 volts from the turbines at Hochfelden, a distance of nearly two miles. Although thunder-storms are very frequent, yet there have been no breakdowns, as the Siemens' lightning arrester fulfils its function satisfactorily.

Safety Buffers. SINCE the disastrous accident which occurred in Glasgow some months ago, we are pleased to learn that several sets of hydraulic buffers have been installed at the Central Station in that city, but we do not gather that any have yet been fitted at St. Enoch's station, the scene of the recent disaster. Seven sets have been furnished, however, at King's Cross station, London, and it is to be hoped that the example will speedily be followed by other companies. The type of buffer to which we refer has pistons with a stroke of 7 ft. and is designed to bring to rest, within that distance, a train weighing 400 tons when travelling at the speed of ten miles an hour. The buffers offer a constant retarding effect, and as the pistons are forced in, water passes from the back to the front through holes so proportioned that, as the speed of the train is reduced, so also is the flow of water. Experiments conducted both in London and in Glasgow showed that trains weighing about 370 tons, and moving at the rate of 9.4 miles an hour, could be brought to rest smoothly and without the slightest risk to passen-

gers or rolling stock. Useful as appliances of this kind may be, they should not be allowed to encourage the neglect of improved brakes, which are so urgently required on nearly all British railways.

Electric Tramways for North London. FURTHER evidence is afforded of the change gradually being effected in the suburbs of the Metropolitan, by the opening of an electric tramway between Finsbury Park and Tottenham. The work, which has done so much for the benefit of the people, by destroying the rural character of many delightful districts in the south and west, is now being extended to the north. The tramway routes, transferred in 1901 to the Metropolitan Electric Tramway Co., are being actively converted to electric traction. But these routes represent only a small portion of the electric lines in course of completion, for the company have in hand a network comprising some forty miles of track, many lines of which are almost ready for traffic. A large generating station is already erected near Enfield, and sub-stations, in course of equipment at Edmond Wood-green, Finchley, and Hendon. Taking into account the lines belonging to the company and those to be operated in agreement with the Middlesex and Herts County Councils, it is easy to see that the most pleasant places in the northern districts will soon become enjoyable than they have been. But change is inevitable, and that it will be for the good of the greatest number one can doubt.

The Working Men's Council make an appeal to the College. PROFESSOR DICEY and his colleagues have made an appeal for contributions to an estimated amount of 8,000l. to enable the college to carry out its extending work in new buildings that have been begun in Crowndale-road, Camden Town, and Mr. W. D. Caroe's plans and designs. The sale of the two old houses in Grosvenor-street, occupied by the college during nearly fifty years past, and the descriptions already made, yield a sum of about 32,000l., whereof 8,000l. have been expended upon buying the fresh buildings and 24,000l. are set aside for the buildings and a "maintenance fund" for payment of teachers, plant, etc. The college was founded in 1854 by Frederick Denison Maurice, Mr. T. Hughes, Mr. Furnivall, Professor Westlake, K.C., Mr. J. M. Ludlow, and Mr. J. M. Ludlow and others, for giving working opportunities of gaining education to men as a means of living and not merely means of livelihood. The students, whose numbers increase yearly, include men employed in the building, furnishing, coach-making, printing, leather-working and other trades, together with postmen, clerks, and waiters, who are represented upon the board of management. On the roll of past teachers are the names of Hughes, Burne-Jones, Rossetti, Madox Brown, Charles King, and Ruskin; the greater part of the teaching-staff are Cambridge and Oxford men, who give their services gratuitously as do some who themselves were educated in the college.

The parishioners have passed a resolution in approval of the proposed union of the united benefices of St. Peter-le-Poer and St. Bene't Fink with those of St. Michael, Cornhill, and All Hallows, London Wall. St. Ben's church of St. Bene't Fink (Finch), Threadneedle-street, was pulled down in 1842-4 for the rebuilding of the Royal Exchange. The church of St. Peter-le-Poer, formerly "St. Peter by St. Austines Priory," which will now share the same site, was built in 1789-92, after Jesse Gibson's plans and designs, on the site of the one which, having been erected in the prior half of the XVIIth century, and enlarged in 1615-30, escaped from the Great Fire (see the two views in vol. lix. of the *Gentleman's Magazine*). The older edifice projected into the street; at the building the front was set back and part of the graveyard was taken in at the rear. Gibson's church forms a quadratum on plan, having an inner diameter of 56 ft., and is lighted by twelve large arched windows in the rounded lantern of the domical roof. The front includes a central order of four engaged Ionic columns having enriched capitals and carrying an entablature and pediment, above which rises a square tower of two stages, surmounted with a stouated cupola and a finial. In 1890-1 Messrs. Arthur and A. E. Billing carried out an extensive alteration and redecoration of the interior of the fabric; they removed the gallery that extended around the whole of the walls—the western apse excepted—leaving only a small portion for the organ, converted the old oak seats into open benches, raised the apse floor by three steps, and raised a part of the floor of the body of the church by two steps for a choir. There are nearly 700 sittings; the organ by Green, 1792, was enlarged and improved in 1874 by Castello. It is not commonly known that in the former church was buried Edmund Gunter, rector of St. George's, Southwark, in 1615-1626, who in 1619 was appointed Professor of Astronomy at Gresham College (then in Old Broad-street), where, with Briggs, he computed the first set of logarithmical tables wherein the base is the number ten—Briggs calculating the logarithms of the natural numbers, and Gunter those of trigonometrical functions. He introduced the chain since called by his name, and invented in 1624 the logarithmical or "Gunter's" scale, also known as the slide-rule, and in 1606 published an explanation of the uses of the cross-staff, and of the sector, as invented by him. In 1622 he was the first to observe a change in the variation of the compass-needle after a lapse of time—a change which Gellibrand conclusively proved subsequently. His two successors—Gellibrand and Samuel Foster—in the professorship were buried also in the church.

A REPARATION of the fabric of Hogarth's House, Chiswick, has been carried out by Mr. F. W. Pell for Colonel Shipway, who, it is understood, is about to dedicate it to the public as a museum associated with the life and works of Hogarth. Hogarth occupied the house, which in itself is an uncommon example of its period, as a summer residence during

the latter years of his life; he lived there some months immediately preceding his death in Leicester-fields on October 26, 1764. Drawings of the house from the opposite side of the road and from the garden on the west side (the latter being by Mr. Roland W. Paul) were published, with descriptions of the structure, in the *Builder* of February 8, 1890, and June 22, 1901, respectively. Fourteen years ago the house was taken by the Typographic Etching Company for their Hogarth Works. The property was offered for sale in November, 1901, and bought at auction for 1,500*l.* by Colonel Shipway. Hogarth purchased it in or about 1750, after he had returned from his unlucky visit to Calais, and left it to his widow, who demised it to her relative, Mrs. Mary Lewis, with remainder to some persons named in Mrs. Hogarth's will. A subsequent tenant, in 1814-26, was the Rev. Henry Francis Cary, the translator of Dante. It is said that Hogarth planted the mulberry tree and that the two leaden urns upon the gate-posts were given to him by Garrick.

THE ROYAL ARCHAEOLOGICAL INSTITUTE AT BRISTOL.

AFTER an interval of fifty-three years the Royal Archaeological Institute has again chosen Bristol as the centre of its annual meeting, and the popularity of the choice has been sufficiently demonstrated by the fact that over one hundred members and their friends have taken part in the proceedings.

The inaugural meeting was held at twelve noon on Tuesday, July 19, at the Council House, where the Lord Mayor of Bristol, Sir R. H. Symes, opened the proceedings with a few words of welcome. Mr. F. F. Fox also welcomed the Institute as President of the Bristol and Gloucestershire Archaeological Society. The President of the Institute, Sir Henry H. Howarth, K.C.I.E., having thanked the Lord Mayor and Mr. Fox for their kind words, the chair was taken by the President of the meeting, the Bishop of Bristol, who delivered an address, in the course of which he said:—

President's Address.

You will see the main outlines of the Saxon town preserved with unusual clearness, unusual considering the vast growth which has supervened. I call it Saxon, but in my belief the outlines are British. If you place side by side the simple ground-plan of the nucleus of Bristol and the ground-plan of the early British fortress of Malmesbury, one of the most unchanged ground-plans in the kingdom, you will see that the resemblance is most striking. At Bristol the River Frome and the Avon surrounded the site, except at one narrow neck where in later times the Norman Castle and the New Gate barred the approach. Below the town the two rivers joined and flowed on together to the sea. At Malmesbury the Newton Water and the same River Avon played exactly the same part. They enclosed the site, except at the narrow neck where in later times the Norman Castle and the West Gate barred the approach. Below the town the two rivers joined and flowed on together to Lacock and Bath and Bristol. This looks as if the Britons on the Avon had a fixed principle in their methods of forming strongholds. When we go to Malmesbury next Thursday, you will see all these features with striking clearness; whereas in Bristol they are greatly obscured, especially by the fact that the turbulent and mischievous River Frome is now made to run in tunnels underground. The resemblance is, of course, not in any way spoiled by the fact that at Malmesbury the rivers run from west to east, from which it follows that the main gate, by the Castle, is the West port; at Bristol they run from east to west, and the castle and the gate are at the east. In these two cases we have, as I believe, as clear examples as can be found in this island of British strongholds retaining their outlines to the present day, notwithstanding the superposition at Bristol of a Saxon town, a Norman town, a mediæval town, and, since the Tudor time, when Bristol

was fortunate enough to get a Bishop, an English city.

It is open to the imagination to suggest that the early British camp here was afterwards put into order and made into a place of permanent residence and defence by the Romans. The two main thoroughfares run at right angles to one another, intersecting at the centre, and forming a cross. The northern limb of the cross leans a little towards the west, but the orientation is otherwise rather curiously correct.

We have the added interest of a church at three of the four angles of the cross, while in the centre of the meeting-place of the highways there stood the High Cross of Bristol. To see the cross, you must go to Stourton, in Wilts. Of the churches, you can see two still *in situ*, each in its own special way very worthy of inspection. The other church is represented by the Council House, in which we are now met.

Further, at the points at which the two highways cut the encircling walls on the north, west, and south, again were churches, and, of course, gates. To the east was the only approach by land, on the narrow neck between the two rivers. This, being the point most liable to hostile attack, was naturally the point which in the early times was least secure and safe for the site of a church—the point at which the changes have been greatest, as successive methods of defence have been rendered necessary by successive methods of attack. In this region, but south of the main thoroughfare, there is now a fine church, the original building probably coinciding with the erection of the great tower by Earl Robert, which effectually blocked the approach from the east, and made St. Peter's safe from attack. The old town, like the modern city, recognised the force of the saying, "Ein feste Burg ist unser Gott."

Of the churches at the other gates two remain, St. Nicholas and St. John. No member of the Institute should leave Bristol without visiting both of these churches, and both stories of each, church and crypt. St. John's Church is the width of the town wall, and St. John's Gate is the only one of the four gates which remains.

The original circular contour of the ramparts of the British fortress remains unchanged on the north, west, and south. If you emerge from the original fortress or camp by St. John's Gate, on the north, and turn to the left, you can walk or drive by a fairly regular semi-circle till you reach St. Nicholas's Church, where was the gate on the south. On your way you pass the site of the west gate, St. Leonard's; but it and its church have disappeared.

Let anyone should suppose that I am speaking of considerable distances from extreme point to extreme point, commensurate with the idea of a modern city with a population of some 400,000, I may say that the walk or drive which I have suggested round this semi-circle is only about 515 yards; while the distances from the central crossing to the three gates are in two cases 190 yards, and in the third case, to the south gate, only 125 yards. My Lord Mayor rules gently and quietly over a larger domain than did those turbulent and haughty chieftains, to whom there once came an unbelievable rumour that some foolish and impudent barbarians had tried to land on the southern shore of Britain, led by a person called Caesar.

Among the multitude of interesting places within reach of Bristol it has, of course, been a difficult matter to make a selection of places to visit. How rich our store of archaeological neighbours is may be gathered from the fact that we do not even include Berkeley Castle. Indeed, we leave Gloucestershire entirely alone, crowded as it is with striking objects, some of them almost at our gates. This tends to ethnological simplicity, for it almost eliminates the Hwiccas from the peoples whose lands we invade. I say almost, not altogether, because I claim that Bath was Hwiccan from the time of the battle of Deorham in 577 to quite late in the Anglo-Saxon times. For the rest, your visits will be paid to lands permanently occupied by the West Saxons, and the lands almost or quite as permanently occupied by the Britons. To one whose diocese includes, as the diocese of the Bishops of Bristol now does, besides the city itself, a considerable part of Hwiccan Gloucestershire, 100,000 people in British Somerset, and eighty parishes of West Saxon and British North Wilts, the characteristics of those various peoples, physical and otherwise, stand out clearly marked to this day. The two types of skull, the long and the round, are still located with curious accuracy. There is probably no place in the kingdom where this

is more clearly the case than at Malmesbury, in hut not of the West Saxon land. It was a great British fortress down to the year 656. Its isolation in the dense forests, and its established importance as a British and Sootic school of learning, preserved its individuality, and kept its population British after the conquest of the West Saxons. King Athelstan riveted that stamp upon it by presenting it with a large estate, to be held by commoners, who must reside within the walls of the town, and must be sons of commoners or men who have married commoners' daughters. Those strict provisions account for the accuracy with which the boundaries of the town have been preserved, and for the British roundness of the skulls.

Mr. Hope, Mr. Brakspear, and the present President trust that when you are at Malmesbury you will be pleased to approve the work we have done to arrest the threatened decay there. I personally regard it as among the most conservative works done in this generation.

I will, in conclusion, only refer to one point of detail; but it is a detail of very high interest, affecting an event of the highest importance. When you dive down into the Severn Tunnel on Friday and Tuesday next you will be very few miles from the striking Severn Cliff at Aust. When you are at Malmesbury next Thursday you will be only a few miles from Cricklade. At one or other of those two places, both in the diocese of Bristol, Augustine of Canterbury, came to found a new church of the English, met the representatives of the ancient British Church.

The Britons on the other side of the Severn would not pray in the same church with West Saxons, or sit at the same table. If a Saxon left anything at a meal, the Briton threw it to dogs and swine. Before a Briton would condescend to use a dish which a Saxon had used, it must be scoured with sand or purified with fire. The Briton would not give the Saxon the kiss of peace—a blessing, I suspect, in a rather thin disguise. If a Saxon crossed the Severn the Britons would hold no communication with him till he had endured a penance of forty days. A vote of thanks to the Bishop for his address terminated the proceedings.

After luncheon a visit was paid to some of the more important ancient buildings in the city, beginning with the Cathedral. Here the members, having been received by the Dean, Dr. Pigeon, assembled in the chapter-house to hear a description of the building from Canon Barnett, who afterwards conducted the party round the church and pointed out the chief features of interest. A move was next made to the Church of St. Mark, till recently known as the Mayor's Chapel. This formed the church of a priory of Black Canons, founded first as an eleemosynary establishment by one of the Gaunt family. The church was originally cruciform and aisleless, of excellent XIIIth century work, with the choir extending half-way down the nave; but in the XIVth century a south aisle was added to the western half of the nave, and in the succeeding century the south transept was carried up as a tower. To the east of this, in the reign of Henry VIII., was added a richly-decorated chapel with a fan vault and a gorgeous floor of Spanish tiles. The great west window is a fine example of the beginning of the XIVth century, and the eastern end owes its reconstruction late in the XVth century to the munificence of Miles Salley, Bishop of Llandaff (ob. 1516), whose tomb and effigy remain in the north wall. The church is rich in monumental remains of all dates, including several interesting effigies of cross-legged knights. The history and leading features of the building were pointed out by Mr. W. R. Barker. The well-known Church of St. Mary, at Redcliffe, was next visited, and described by the Rev. C. S. Taylor.

St. Peter's Hospital, Bristol.

Returning into the more ancient part of the town, the party reached St. Peter's Hospital, a half-timber house, mostly of the XVth and XVIIth centuries, now used as the offices of the Bristol Board of Guardians. The visitors were here received by Mr. Evans, the chairman, and Mr. Hiscox, the Vice-chairman of the Board, and then assembled in the old Court-room, when Mr. J. J. Simpson read the following notes on the history of the building:—

This building is an interesting example of the picturesque domestic architecture of olden times, perhaps the completest specimen remaining in the city, some portions dating from the XIVth century and other portions dating from the commencement of the XVIIth century.

The earliest ascertained owner of the house, or an earlier one on the same site, was John Corne, who in 1401 disposed of it to Thomas Norton, who had come into a great fortune through Elias Spelly, Mayor of Bristol in 1390-1. Thomas Norton was himself Mayor of Bristol in 1413. In 1435 the mansion passed into the hands of Norton's two sons, Thomas and Walter, who divided it into two dwellings, Thomas residing in the eastern and Walter in the western portion of the building. The whole came into the possession and occupancy of Walter Norton in 1458. Walter had two sons, both named Thomas, and two daughters, married to wealthy Bristolians—Robert Strange (thrice Mayor) and John Shipward, jun. (Mayor 1477-8). One of these sons was notorious in 1479 for his hostility to the Mayor, William Spencer, against whom he alleged high treason to the King (Edward IV.), a very long and interesting account of which appears as a "Remembrance," compiled by John Twynho, then Recorder, in the Great Red Book of the City. The mansion remained in the occupation of successive generations of the Norton family until 1580, when Sir George Norton, the then owner, and also owner of the mansion of Leigh, sold it to Henry Newton, afterwards Sir Henry Newton, of Barr's Court. The next known owner was Robert Chambers (1602), who sold it in 1607 to Robert Aldworth, a wealthy merchant, whose initials are to be seen on the river front, with the date 1612. At the latter date this gentleman made considerable alterations and additions, practically rebuilding the house in the style of the period, for in a later deed it is described as having been "by the said Robert Aldworth erected and new built." In September, 1612, the Corporation granted him, at a fee farm rent of 3*l.*, the fee of another house in the same parish of St. Peter, and it is possible that this acquisition forms the earlier portion of the building, which the alderman left unaltered. At any rate, this eastern frontage in the churchyard is of much earlier date, and there is little doubt that it formed part of the original edifice of the Nortons. The open timbered Gothic roof over the Jacobean plaster ceiling in the court-room is also of this earlier date, and was probably the canopy of the great hall of the mansion before the reconstruction of 1612, and extended from the back to the front of the building. The street frontage, with its bold spurs and brackets, which sustain the successive stories, the carved fillets between the stages, the grotesque woodwork, panels, bay windows, and gables form part of the reconstruction effected in 1612 by Aldworth. So is the court-room, the chief apartment of the house, a beautiful Jacobean sitting-room of Aldworth's time, with its panelling of oak and its sumptuously executed plaster-work ceiling, constructed in square, diamond, and quatrefoil compartments in bold relief, with floral ornaments, emblematical devices and winged figures, fringed with a deep cornice. The window some time ago replaced a former one which had bold stone mullions. The adjoining apartment is similar in character, but there are some quaint sculptured figures in the porch of the river front, near the monogram and date (1612) before referred to. Practically all other portions of the building are of modern reconstruction. Briefly pursuing the history of the building from Aldworth's time (and by the way, there is a fine tomb in the adjoining church to the memory of Aldworth, who died in 1634), we find it in the possession of Aldworth's relative, Eldridge, and successively inhabited by various families, until it became appropriated to trade purposes about the middle of the XVIIth century. It was first used as a sugar house, and it is supposed that this was the place in Bristol visited by Evelyn, who in 1654 wrote:—"Here I first saw the method of refining sugar and casting it into loaves." Then, in 1696, on the Government determining to supplement the coinage at the Tower by the establishment of branch mints in some leading provincial towns, the civic authorities pressed the claims of Bristol, and, being informed that provision of a suitable house must first be made at the cost of the citizens, it is recorded that the City Corporation appointed a committee "to make a bargain with Sir Thomas Day for the Sugar House, and the House will find the way of paying the rent." The Sugar House referred to was this building, and it was occupied as a mint from 1696 to 1698. In the British Museum is a unique placard, issued by the Mayor and aldermen in August, 1696, giving notice that the Government had sent down, for the benefit

of the city, one thousandweight of silver valued at upwards of 3,000*l.*, to be coined at the new Mint, and requesting the inhabitant to further the operations by furnishing oil plate, for which a reward of 6*d.* per ounce would be paid in addition to the standard value of 5*s.* 2*d.* Holders of old hammered money were also promised a premium on the amount they sent in. How largely the invitation was responded to is attested by the fact that within about sixteen months the Bristol Mint dealt with nearly 2,000,000 oz. of silver, which were converted into 473,728*l.* in coin. Finally, in 1698, the old house passed into the hands of its present owners, then known as the Corporation of the Poor. This body was established, under special Act of Parliament, in 1696, and was the first Board of Guardians formed in England. The Corporation of the Poor, finding in 1699 their workhouse inadequate, appointed a committee to select some other building, and this body reported in December that they found "none so fit or convenient for the purpose as the Mint." Negotiations were opened, and in 1698 it was purchased for 800*l.* from Edward Colston and others, and thereupon converted into a workhouse for the poor. The beautiful Jacobean sitting-room, erected by Aldworth, was fitted up by the guardians as a chamber or court-room for their meetings, and has been used continuously since October, 1698, for this purpose. The entire premises are now occupied for administrative purposes only by the guardians, who on quitting the court-room in 1901 for the new board-room in the south-western portion of the building preserved the historic apartment intact.

Bristol Churches.

The adjoining Church of St. Peter, an interesting building of the XIVth century, with some good late monuments and a fine XVIIth century altar-piece, was next visited under the guidance of Mr. C. E. Bonebrake. Lastly, a move was made to the Church of St. John, which is noticeable for its vaulted under-church and a western tower built over one of the city gates. The upper church is a aisleless parallelogram of six bays with a short chancel, also of the XVth century, and containing a handsome Jacobean communion-table and an interesting post-Restoration font of peculiar form decorated with cherubs' heads in relief and retaining its old wooden cover. There is a good tomb and effigy of a civilian on the north side of the chancel. The tower was used in common with the destroyed Church of St. Lawrence, which adjoined it on the west. The under church is not now used for services, but contains an interesting early XVth century alabaster tomb with effigies of a civilian and his wife, as well as other ancient memorials. The chief features of the church were pointed out by Mr. H. C. M. Hirst.

Lake Dwellings.

At the evening meeting Dr. Monro read a paper summarising the latest researches on Lake Dwellings, a subject which he has made especially his own.

Dr. Monro described lake dwellings as a unique phases of bygone civilisation, narrated the circumstances which led to research being made, and gave details of lake dwellings in different parts of the world. Speaking of the Glastonbury lake dwellings, the lecturer said they were discovered in the spring of 1892 by Mr. Arthur Bulleid, and had since been largely excavated under his care. The site of this remarkable settlement occupied some three or four acres of a flat meadow within the boundaries of what was supposed to have been formerly a marshy lake. Before excavation were begun all the eye could discern were sixty or seventy low mounds huddled in the corner of a field. These mounds were the debris and sites of dwelling huts, and the foundations on which they stood consisted of layers of brushwood and stems of small trees bound together, in some places at least, with transverse morticed beams precisely similar to the Scottish and Irish crannogs. The huts were circular or oval, and varied in size from 20 to 35 ft. in diameter. Each hut contained a central hearth, sometimes neatly made by flat stones imbedded in the clay flooring, which existed in all of them. But as subsidence, due to the compression and decay of the understructure progressed, the occupants superadded new clay flooring. The relics illustrated with rare and singular completeness the life history of the community which inhabited them. Many of them exhibited the special characteristics of

to Celtic art, which gave the collection an exceptional importance among lake dwellings hitherto discovered within the British Isles. The paper was illustrated by excellent engravings, showing remains of typical lake dwellings and the relics discovered within them.

Crocombe Church.

On Wednesday the 20th a special train conveyed the party, which numbered about ninety, to Shepton Mallet, when carriages were in readiness for a visit to Crocombe. Here the parish church, an interesting aisled structure, chiefly of the XIVth century, with western tower and spire, was inspected under the direction of Mr. J. T. Micklethwaite, who called special attention to the magnificent Jacobean screen, parloise, and pulpit with sounding-board, set up in 1616, as interesting testimony of the efforts made by the Carolines to revive the decent arrangements of our church, which had been done away with under Puritan influences. The church is also rich in woodwork of older date, retaining, as it does, most of its XVth century pews, as well as an open roof of exceptional richness. At the west end of the south aisle is a two-storied treasury with strongly grated windows, and to the north of theancel the shell of a two-storied vestry, with a ribbed stone vault to the upper chamber.

Glastonbury Buildings.

The drive was next continued through Glastonbury. Here, after luncheon at the George Inn, an almost unaltered hostelry of the late XVth century work, with an elaborately decorated front, a visit was paid to St. Mary's hospital, the history of which was explained by Canon Grant. This consisted originally of a XIIIth century hall, which served as the living and sleeping room of the inmates, with a chapel at the east end. Through later alterations and changed conditions the hall has been roofed, and the cubicles that lined the outer walls have given place to two rows of small utes, which have so encroached upon the hall as to reduce it to a narrow passage. The magnificent XIVth century barn of the abbots of Glastonbury was next visited, and described by Mr. Brakspear, who demurred to a suggestion made by Mr. Micklethwaite that the small side-aisle of exit were to furnish a draught of air for the main hall. The perambulation was continued to St. John's Church, a large XVth century building with grand western tower, but originally cruciform, with a tower over the crossing, which was lucidly described by Mr. R. Peers, who pointed out the evidence of the former arrangements.

From St. John's Church the party went to the Abbey, where Mr. W. H. St. John Hope explained in detail the architectural history of the buildings, and pointed out from the evidence of the existing remains that the great church was built, as usual, in regular order from east to west. He also discussed the singular history of the beautiful western Galilee and Lady Chapel, and showed that the accepted opinion of the latter with the name of St. Joseph Arimatea had no earlier authority than an engraving made by Hollar in 1650. The Bible XIVth century kitchen of the abbots' hall, and the chapel of Abbot Beor's almshouse for poor women in the outer court, with its original stone altar, were also inspected.

After an examination of the interesting series of objects discovered in the Glastonbury lake-dwellings, and now in the museum, the party returned by special train to Bristol.

Roman Somerset.

At the evening meeting a paper was read by Mr. F. Haverfield on "Roman Somerset." Mr. Haverfield described Roman Somerset as an interesting subject which had not been properly worked out. Its principal features were (1) an important spa at Bath; (2) a village at Emerton, explored by Mr. Skinner about 1815, and another at Hebestor; (3) lead mines at Mendip, of which our record was shamefully scanty; and (4) various villas, all apparently of normal types, distributed in groups (as near Merton, or in the Wrington Vale) or near the Fosse. Survivals of late Celtic art could not be traced, as on Ham Hill. Of these features the most important was unquestionably the spa at Bath, which was early used by the Romans. Its two great buildings were the temple of Sulis Minerva and the baths. The temple was a tetrastyle edifice with fine Corinthian columns and a pediment singularly well served containing a wonderfully vigorous head of Medusa. This head, fixed on a circular

shield, was no doubt connected with Minerva, like the owl which also appears in the same pediment. Its astonishing and barbaric vigour made it unique among the products of provincial art in the Western Empire. It was also remarkable for the beard and moustache on the Medusa's face, an almost "unique detail, but perhaps explicable as a "contamination" of similar heads. Another feature of the temple, or of its vicinity, was a pilastered façade, decorated (*inter alia*) with small bas-reliefs of the Four Seasons, poorer in style than the pediment. The baths were noticeable for the plan, which deviated widely from that of ordinary city baths, like those lately unearthed at Silchester. They consisted of large basins, the largest quite 80 ft. by 40 ft., with hypocaust rooms at the eastern and western ends of the suite. They resembled the baths of Badenweiler or of *Aqua Flavianæ* (in Numidia), and seemed to exemplify the plan of thermal baths as distinct from city baths. The visitors to Roman Bath consisted of invalided soldiers or veterans, and of civilians from various parts of Britain and actually from the north-west of the Continent—for example, from what are now Chartres and Metz and Trier—and must have formed a discreet society of a simple, provincial kind.

Corsham, Lacock, and Malmesbury Buildings.

On Thursday, the 21st, a special train conveyed the party to Corsham, when the picturesque group of freeschool and almshouses founded and built by the Lady Margaret Hungerford in 1663 was first inspected under the guidance of Mr. Harold Brakspear. The buildings comprise an L-shaped block, of which one wing contains the hall, with its carved wooden gallery, and which served also as the chapel and schoolroom. At the angle is the master's house, and the other wing contains the two-storied chambers of the inmates. In rear of these is an interesting covered ambulatory or portico, forming a gallery of communication with the hall, etc. and opening on to a row of little gardens divided by low stone walls. The journey was next continued to Lacock, where the parish church, an interesting building of the XIVth and XVth centuries with a very ornate lady-chapel, was first visited. The lady-chapel bears the arms of Bishop Nevill, and has a rich fan vault with pendants encircled by carved garlands of flowers. Against the north wall is the elaborate tomb of Sir William Sharington (*ob.* 1553), the grantee of the abbey. Through the courtesy of Mr. C. H. Talbot, an inspection was also made of the abbey itself. This was founded for a convent of Austin Canonesses by Ela Countess of Salisbury in 1232, and at its suppression in 1539 was converted into a dwelling-house by Sir William Sharington, who pulled down the church as superfluous, but added a picturesque courtyard of offices on the north. The cloister, with its XVth century groined ambulatories, is still perfect, and is surrounded by the two-storied ranges of the original monastic buildings, which are based upon the usual plan. The chapter-house is of considerable architectural interest, as is a large vaulted vestry on the north of the site of the choir, which served also as a quasi-transsept. The moulded chimneys, the picturesque gables, and other features of Sir W. Sharington's work are quite equal in interest to the remains of the mediæval period. The house also contains many important pictures and examples of old furniture, and in the muniment room and the prospect tower above it are two wonderful tables with marble tops and richly-sculptured stone supports with figures of satyrs, etc. After an examination of the buildings under the guidance of the Rev. W. G. Clark-Maxwell, the journey was resumed to Chippenham. From here the party went after luncheon by train to Malmesbury, and on arrival climbed the hill above the station to inspect the abbey church. This was described by Mr. Harold Brakspear as consisting of six bays of the nave only of a vast church, the eastern half of which has entirely disappeared, but the size of it can be recovered from the dimensions recorded by William Botener *alias* of Worcester. He also showed that the ascription of the building of the church to Bishop Roger was erroneous, the style of the work according more nearly to about 1150-60, by which time the property of the Abbey had reverted to the monks through the bishop's death in 1139. The existing remains consist of six bays with pointed arcades and triforium of transitional Norman work, with a fine XIVth century clerestory and ribbed vault, a rich porch, also of Norman date, and some

remains of the west front and central tower. The porch has been eased in the XIVth century, apparently with the object of carrying it up as a tower, but this was abandoned, and the steeple actually built over the last two bays of the nave. This seems to have collapsed during the latter half of the XVIIth century, ruining in its fall the western end of the nave, which has since remained walled off from the rest. After inspecting the market cross, a very complete example of a date about 1500, the party returned by special train to Bristol. The evening meeting, by invitation of the Lord Mayor of Bristol, was held at the Mansion House, when the Rev. Canon Church read a paper on some incidents of history at Wells in 1464, 1470, and 1498.

THE ETON WAR MEMORIAL COMPETITION.

THE Eton Memorial to those who fell in the war is to be, when executed, in the form of a memorial building containing a hall and library. The designs, all by architects who are old Etonians, were privately exhibited at Eton, and are now on view publicly at the rooms of the Society of Antiquaries. It should have been, we should think, the business of the Hon. Secretary to the Committee, in justice to the architects, to see that they were properly and intelligibly arranged, which has not been done. The drawings of several sets appear to be mixed; and while the names of a good many competitors are given on cards placed in front of them, two of the most important sets, at the time of our visit, had no name attached, and one of these must have been that of Mr. Mount, the winner of the second premium, whose name we could find nowhere in the room; but which of the two was his there was no means of knowing. That is not the way to do things.

If "the plans, sixteen in number, obtained warm approval from the assessor," as stated in the circular sent to competitors, we fear that the assessor's natural amiability induced him to make things pleasant all round; or else the Committee interpreted his praise in a more comprehensive sense than he intended. There are four good designs; the rest are but mediocre, and some of them very poor.

Mr. L. K. Hall (a name new to us), who obtained the first premium, has produced a refined and original design, with a plan which is perhaps a little too original; that is to say, though certainly calculated to be effective, it rather wants simplicity. He places his Hall on the upper floor of a longitudinal block, on the ground floor of which is a gateway in the centre of one side, opening on a wide columned passage which runs across the width of the building, and gives access to a museum on the right and to a pillared Hall leading to the main staircase on the left. Apparently this cross passage is intended for the purpose of a carriage porch when there are meetings in the Hall. Parallel to it on the left is an indoor corridor, as one may call it, leading to a porch at the other side of the block, which gives access to the library, an octagonal domed building attached unsymmetrically to the main block. It is certainly not a commonplace plan, but it is rather wanting in decisive lines of setting out. The general architectural style is late English Renaissance: a stone rusticated ground story; semi-circular headed windows above with stone architraves on a ground of brick-work, and festooned garlands over. Internally the hall is divided into bays by coupled columns, and decorated in the lower portion by rich and effective wood panelling; the roof is a segment of a circle with Welsh vaults over the windows. The library has a central dome on arches carried by coupled columns at each angle of the octagon, with an aisle between them and the outer wall. The columns are rather too narrow for their height. The drawings are very good, and the whole shows artistic feeling.

The design which is probably the second premiated one, shows the side elevation of the Hall block with a plain brick ground story, in the centre of which is a main entrance rather powerfully treated with a coupled order in rusticated masonry and a riot of rococo details above the entablature; at each end of the façade is a minor entrance, the two treated symmetrically; concerning these we may observe that a band of rusticated work lining up each jamb and carried round the arch in the same way, has a rather tame and

mechanical effect. In the upper story the windows are treated with massive masonry "dressings," alternately angular and circular, with heavy keystones; all this is in a very good style of work of its class. The plan is a straightened one with a longitudinal block for the Hall, and a square library block attached to it.

A design with a plan of somewhat similar type shows a very carefully worked out and rather grandiose classic exterior showing the influence of Wren. The flank façade shows stone pilasters on a brick ground, with large circular windows in the upper part of each bay; the two end bays are kept solid and treated entirely in masonry. In the section the Hall is shown decorated half-way up with wood wainscoting, again strongly suggestive of the influence of Wren; and the ceiling is treated in a monumental manner, with circular and side panels divided by massive bands of foliage in the orthodox manner. There is, it is true, much originality in all this, but the whole effect would be dignified and consistent.

The design by Mr. Ambrose Poynter (third premium) is more really collegiate in style than any other; at least, it turns a collegiate face towards one side of the site, the hall being lighted on that side by large mullioned windows; though on the entrance side the treatment, with separate smaller windows, is more of the late Renaissance type. The plan is cleverly arranged in regard to approaches, with a reception room communicated with two entrance vestibules, the one at the end the other at the centre of the side. The section of the hall roof is a semi-circle springing from a flat at each side; in the section the decorative treatment of the ceiling, in panels and with figures at intervals, is well indicated.

Another design we noticed which shows an effective side elevation with a plain coursed-stone ground story, and brick pilaster-like strips above with long windows in stone encadrements between, and circular windows worked in above as a part of the design of the bay. This is a good bit of work. It is one of the nameless designs; at least, there was no name attached to it when we saw it. There are others with the authors' names attached, but we fear we cannot say anything very complimentary of them, and therefore they may as well remain nameless.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

In continuation of our report of the annual meeting of the Association of Municipal and County Engineers, held at Shrewsbury under the Presidency of Mr. A. T. Davis, C.E., we give the following abstracts of papers with discussions:—

Shrewsbury Main Drainage.

Mr. Ridley Taylor, M.Inst.C.E., F.C.S., read a paper on "The Main Drainage of the Borough of Shrewsbury." He said Shrewsbury had an area of 3,525 acres and a population of 28,595 persons. The population was not rapidly increasing one, but provision had been made in the drainage scheme for an increase up to 35,000. The water supply to the borough amounted at the present time to about one million gallons per diem, and it was anticipated that this quantity would be sensibly reduced when the borough was provided with an improved water supply. Hitherto the borough had been supplied with a very limited quantity of drinking water from springs, whilst the bulk of the water supplied to the houses was unfiltered river water. In 1895 the author's firm were called in to advise the borough upon the general question of main drainage and purification of the sewage. The scheme was adopted by the Corporation, and presented to the Local Government Board, and had now been successfully brought to a conclusion. The difficulties that had to be contended with in the design of the scheme were, firstly, the necessity of keeping the sewers at such a level that they would not penetrate to any great depth in the beds of running sand; secondly, the necessity of laying the intercepting sewers at self-cleansing gradients; and, thirdly, the necessity of keeping the head of each intercepting sewer at such a depth as to admit of the existing sewers being connected with the intercepting sewers. The main intercepting sewer on the right-hand bank of the river did not present any great difficulty in its designing, as it was found that, by following along the bank of the river into Frankwell, a

sewer could be formed with satisfactory gradients and at a level sufficient to intercept the whole of the existing sewers. The problem presented on the left bank of the river, however, was a much more serious one, as an intercepting sewer laid under similar conditions to that on the right bank of the river would have been out of the ground at its higher end if self-cleansing gradients had been adopted; it was found, in fact, that the intercepting sewer could not be laid beyond Welsh Bridge at a sufficient depth to pick up the existing sewers. The two intercepting sewers described dealt with the majority of the sewage entering the river, but there still remained considerable volumes of sewage from the Cotton Hill and Castle Fields districts. It was found possible to bring the sewage from these neighbourhoods to the pumping station by means of a tunnel passing under the hill between Shrewsbury Castle and the gaol. These main intercepting sewers, with the necessary extensions, provided drainage facilities for the whole of the borough. The work of constructing these sewers proved an extremely difficult and costly undertaking, the nature of the ground involving the use of large quantities of concrete, and many thousands of cubic feet of timber had to be left in the trenches. The site of the pumping station was fortunately free from running sand, and the subsoil consisted of a fairly water-tight clay. Under these circumstances, it was found possible to construct a large circular storage sewer in brickwork, a cast-iron sewer after its passage across the river, was led into the bottom of this storage sewer, so that when it was full the sewer crossing the river practically became an inverted siphon; but when the suction tank and storage sewer were empty, as happened many times a day in the course of the pumping operations, the sewer crossing the river had a free outfall. This arrangement had been proved after some years' working to be entirely satisfactory. The connexion of the existing sewers with the intercepting sewers had proved an exceedingly difficult and costly undertaking, the work involved being of considerable magnitude. The principle adopted had been to trace out the line taken by the sewer to be intercepted, and, as far as possible, to intercept the sewer at a point above the level of the highest known flood. Owing, however, to the fact that many of these existing sewers passed for considerable distances across private property and under buildings, this had not been found possible in every case. Each intercepting chamber had to be of a separate and special design, but, generally speaking, the principle adopted was, after carefully ascertaining the dry-weather sewage flow down the sewer, to form controlled openings in the intercepting sewers of such a size as to admit a volume of liquid equal to six times the ascertained dry-weather flow. The old sewers had been retained to carry off as storm-water direct to the river any quantity of liquid in excess of that which had passed through the controlled opening. The intercepting sewers varied in size from 30 in. to 12 in., and each particular sewer was laid at a gradient sufficient to give a minimum velocity of liquid of about 130 ft. per minute when running half full. Experience had shown that these velocities were sufficient to keep the intercepting sewers in a clean and proper condition. Various storm overflows were provided along the lines of intercepting sewers, so as to relieve them of excess storm-water which might be brought to them in times of excessive rainfall. The sewage, on its arrival at the pumping station, was screened through double removable screens with $\frac{1}{2}$ in. spaces. After leaving the pumps, it was passed through a large air vessel, which was kept constantly charged with air by a special pump, and was delivered through a 21-in. cast-iron pumping main to the head of the gravitation sewer. This gravitation sewer was 30 in. in diameter and ran direct to the purification works without pumping. The sewage on its arrival at the purification works was passed through a mixing channel with slat baffles, and was chemically treated with cream of lime prepared in a pneumatic lime mixer. About 10 grains of lime per gallon was added, and, when necessary, a small dose of aluminoferric was also added to the sewage by placing eakes in trays suspended in the channels. After the sewage had received its proper dose of chemicals, it passed into one or other of six precipitation tanks. These tanks were each 23 ft. 9 in. wide by 111 ft. long, with an average depth of liquid of 6 ft. The combined capacity of these tanks was about 600,000 gallons, or rather more than

50 per cent. of the daily dry-weather flow. The tanks were provided with sloping bottoms, the deepest end of the tank being that at which the sewage was admitted. A sludge culvert ran the whole length of the tanks at the deepest end and the deposited sludge was swept into this culvert and eventually pressed. The tank effluent was finally purified by land irrigation. The total area of the land purchased by the Corporation for the purpose of sewage disposal was about 170 acres, and at the present time about 75 acres were laid out for irrigation.

Mr. J. Price (Birmingham) mentioned that the system adopted for dealing with storm water was on similar lines to the method had adopted at Birmingham.

Shone's System of Sewer Ventilation.

Mr. E. George Mawbey, M.Inst.C.E., read a paper on experiments on Shone's system of sewer ventilation at Leicester. He said that in July 1902, the Highway and Sewerage Committee of the Leicester Corporation entered into an arrangement with Messrs. Shone and Auld to instal a small district with Shone's system of drain and sewer ventilation (according to Shone and Auld's patents), for the purpose of carrying out experiments in order to test its practicability and efficiency, together with the working expenses involved therewith.

The area under the influence of the system was 2½ acres, and comprised portions of one of the modern built-up parts of the borough. The streets were 40 ft. wide. It included eight six-roomed houses of the artisan class, at a rental varying from 17l. 10s. to 19l. 10s. per annum, and having a population of 356, with an average of 4·45 persons per house. The total length of foul-water sewers ventilated was 297 yds., constructed on the separate system, the storm-water sewers being quite distinct and receiving the rain-water from the streets and front roofs only. The main line in Paton-street was a 12-in. pipe sewer 202 yds. long, with two branches at right angles, viz., 57 yds. of 12-in. pipe sewer in Wilberforce-road and 38 yds. of 9-in. pipe sewer in Crow-lane. The sewers were laid at an average depth of 10 ft. They discharged into a 3-ft. by 2-ft. brick foul-water sewer constructed on the separate system in Western-road. The sewers dealt with were constructed of Hassall's single lined stoneware pipes, laid in the years 1896-1897. The gradients of the 12-in. sewers varied from 1 in 120 to 1 in 36, and that of the 9-in. sewer was 1 in 50. The private drains operated upon comprised a total length of about 583 yds. They were 6 in. in diameter, with 6-in. branches to the water-closets and 4-in. branches to the sink wastes, constructed with ordinary stoneware socketed pipes. Rather more than half were jointed and filled with Portland cement. The remainder had the puddle joints. In both cases the joints were surrounded by a band of clay puddle 8 in. wide. There were no intercepting traps on any of these private drains. Four-inch diameter cast-iron ventilating pipes, jointed with red lead, were fixed at the heads of the private foul water drains, and carried up above the eaves at the back parts of the houses. To the eight houses there were twenty-seven of the ventilating pipes. The section of sewer experimented upon was trapped off from adjoining sewers at the outfall end by a siphon trap constructed in the manhole of the 3-ft. by 2-ft. brick sewer, and at the flushing manhole near the fan and at the manhole in Wilberforce-road at the junction of Equity-road by shutting down the flushing penstocks. At the upper end of the system a fan and motor chamber was constructed. A 9-in. brickwork in cement mortar, 6 ft. 6 in. long by 3 ft. wide, built under the footway opposite the flushing manhole. In this chamber was fixed a 15-in. Sirocco fan, driven by an electric motor working at 750 revolutions per minute, the current being supplied off the electric lighting cables at 200 volts. Connection was made between the flushing manhole at the fan by 18-in. stoneware socketed pipe. On the footway at one end of the chamber was erected a 9-in. circular steel ventilating shaft 40 ft. high. The fan was connected to this pipe by means of a zinc air discharge pipe, tapered in size from 7 in. square to 9 in. diameter. The main features of the arrangement were that the existing private ventilating pipes or soil pipes, as the case might be, were provided with suitably regulated fresh-air inlets, so that the entire lengths of soil pipes and drains should be swept by the ventilating current into the pub-

and drawn thence to the main extraction shaft, the volume of fresh air drawn in through these ventilating pipes to be sufficient not only to draw away the foul air through the drains from the vicinity of the dwellings in the direction of the flow in the drains, but to so dilute it that could be safely discharged through the main extraction shaft into the open air above the level of the houses, rendering it impossible for there to be any escape of dangerous foul air to or around the dwellings. The most important feature was the constant and uniform drawing away of the soil pipe and drain air from the dwellings and workplaces of the people, thus preventing it finding access thereto. The author had not gone into the question of the capital outlay, as this had been partly borne by the patentees, and would be variable according to the local conditions; but he was of opinion that it would not be such as to prejudice the adoption of the system. The actual working expenses were practically confined to the cost of the electric current consumed in driving the motor. The repairs and maintenance could not be a serious matter, and the attention required was obviously very small. The first complete experiments were commenced on April 27, 1903, and continued for five consecutive days. The average result of these five days' tests was that 16.10 cubic ft. per minute were extracted through the 6-in. shaft, at an average velocity of 1,266 ft. per minute, and a total of 17 cubic ft. per minute was admitted through the twenty-seven inlets on the private ventilating pipes at an average velocity of 3.3 ft. per minute. The total of 31.17 cubic ft. per minute represented an average per inlet of 1.15 cubic ft. per minute, or an average for the house of .43 cubic ft. per minute for the twenty houses in the system. After these experiments the author formed the opinion that not only was the sectional area of the inlets too small, but that the sectional area of the extraction shaft was also too small to obtain results from the motor and fan, and in consultation with Messrs. Shone and Ault, it was decided to experiment on the extraction shaft only. An experiment was then carried out by disconnecting the fan from the extraction shaft, and delivering the air at the street level. This not only resulted in discharging nearly four times the volume previously discharged through the 6-in. shaft, viz., 998 cubic ft. per minute measured in the 18-in. branch leading to the fan, but increased the air admitted through the twenty-seven inlets on the private ventilating pipes from 21.17 cubic ft. per minute to 105.55 cubic ft. per minute, representing 1.5 cubic feet per minute of air per house, at an average velocity of 99.27 ft. per minute, against 29.3 ft. per minute previously obtained, and every one of the inlets was found to be acting at such a velocity as could be recorded by the anemometer. In order to maintain as far as possible this increased efficiency, a main extraction shaft was then substituted for the 6-in., and the fan connected therewith, and tests were made, with a result that 741.9 cubic ft. per minute were extracted through the shaft at an average velocity of 1,264 ft. per minute; and a total volume of 74.59 cubic ft. per minute was admitted through the twenty-seven inlets on the ventilating pipes at an average velocity of 70.2 ft. per minute through the anemometer, representing an average per house of .94 cubic ft. per minute, which was more than twice the quantity of fresh air admitted into the inlets when the 6-in. diameter shaft was in work. At this point of the experiments, viz., in November last, the author felt satisfied that this was a practicable and efficient system of sewer ventilation, which could be thoroughly reliable at all seasons of the year, but the consumption of electrical energy, and, of course, also the cost thereof, was, in the author's opinion, too great for the number of houses dealt with. Although no large intercepting sewers had been at present experimented upon at Leicester, the author saw no reason to doubt that equally satisfactory results would be obtained by the application of the system thereto, and if some other of their members took this up, it would be desirable that he should apply it to a section of sewers of this character. When this system was first proposed by Mr. Shone, the author had serious misgivings as to its practicability, but was nevertheless so impressed with a paper read on this system at Eastbourne, at the Congress of the Royal Institute of Public Health, when he was President of the Engineer-

ing Section, that he felt it was well worth submitting it to a practical trial, and it was only after very exhaustive and practical investigations, extending over a period of at least two years, that he had felt at all justified in expressing any definite opinion thereon. The author was, however, now able to say that the soil-pipes, drains and sewers had by this system been satisfactorily and uniformly ventilated for the period referred to, under the varying conditions of the atmosphere and of the air within the sewers, and that this had been effected without any siphoning out of any of the traps in connexion with the house drains. In fact, the vacuum in all parts of the system had been too small to be registered by a water gauge, although many attempts had been made to obtain readings. The experiments certainly went to show that, by the Shone system, a quantity of fresh air direct from the atmosphere could be supplied into, and circulated through, soil-pipes, drains and sewers, to dilute the air therein to any extent which might be necessary, and according to the results obtained in this practical test at a cost which, having regard to the importance of efficient ventilation, could not fairly be considered to be prohibitory.

Mr. Scott Moncrieff said one of the cardinal points of present-day sanitation was to prevent anything like sewer gas getting into the house. The object of this system was to carry that out on a larger scale in the streets, and it deserved all encouragement.

Mr. W. Weaver (Kensington) said the question of sewer ventilation was a pressing nuisance, and they had so far not been able to get rid of it, especially as regarded large brick sewers. He would hesitate to say that with the large brick sewers they would get a fan effectually to draw out the air at any distance from the base. Mr. Mawbey had shown them that something could be done in the direction of ventilating small pipe sewers, and if some one could embark on another experiment to see how it could be applied to large brick sewers, he was sure the various municipal councils would not hesitate to spend a moderate amount of money to achieve results such as had been obtained at Leicester.

Mr. L. Shone claimed that the system could be as easily applied to large brick sewers as to pipe or iron sewers.

Mr. Caink (Worcester) said that, according to the section, the openings were governed by the distance from the extractor and the number of openings into the sewer. If that was so a difficulty arose when extensions came to be made and houses were added to the section.

Mr. Mawbey, in reply to Mr. Caink, said they calculated the number of houses to be built the same as if they were sewerage a district.

THE SANITARY INSTITUTE CONGRESS AT GLASGOW.

LAST week Sir John Ure Primrose, the Lord Provost of Glasgow, in the presence of a large company of delegates from different parts of the kingdom, opened within the buildings of the recent East-end Exhibition, Glasgow, a health exhibition, which has been organised in connexion with the Congress of the Sanitary Institute. The exhibition is divided into colonial, municipal, and educational sections, and among the exhibits is a model hospital and a model one-house dwelling. In the various sections are sanitary appliances, building materials, heating, lighting, and cooking appliances, water fittings, washing and wringing machines, clothing, disinfectants, disinfecting apparatus, and hospital and sick room appliances. Amongst the most interesting departments is that relating to the hygiene of schools, trades and manufactures, hospitals, prisons, barracks, ships, workhouses, asylums, the burial of the dead, cremation and other means of disposal, and the prevention of accidents and fires, the filtering, softening, and purifying of water, flushing, and sewage treatment are all represented. There is also an equally interesting exhibit of apparatus for water supply, water waste preventers, sinks, baths, lavatories, sewers, drain-pipes, and sanitary goods. Over one hundred of the leading sanitary firms of this and other countries are represented. The main object of the exhibition is to illustrate the practical steps that are being taken to deal with the many problems that present themselves to municipal authorities. The Lord Provost, in declaring the exhibition open, said that they were that day on the threshold of a great sanitary Congress in Glasgow, and while they would

hear much of the onward march of sanitation, it was proper that the material results of that progress, in the way of appliances for healthier and more wholesome living should be demonstrated at the same time. The exhibition served therefore to bring forward in a practical way the methods and problems discussed at the meetings of the Congress in the past.

The annual Congress of the Institute opened on Monday at Glasgow, when the members were received in the St. Andrews Halls by the Lord Provost, Sir John Ure Primrose.

Presidential Address.

Dr. A. Wynter Blyth (Registrar of the Institute), in introducing Lord Blythwood, the President, reminded the members of the valuable service Lord Blythwood had rendered to the country in the furtherance of questions affecting improved sanitation. He also alluded to the fact that a quarter of a century ago the Sanitary Institute, at the invitation of the Corporation, held an exhibition and Congress in Glasgow, which was successful in every way, and excited a great deal of interest and attention in the country. Since then they had many eminent men as presidents, and the list showed that to develop the aims of the Institute, and to diffuse the science of public health, required the efforts of eminent men trained in various schools, and that it could not with profit be relegated to any one class or profession.

Lord Blythwood in the course of his presidential address, said that if any one who was at the first Congress in Glasgow, twenty-five years ago, was at the conference that week they would be able to see the fruits of their labours in the increase of the sanitary arrangements of the city. He was reading the remarks of Dr. Russell, the medical officer, on the condition of Glasgow in 1818, in which he pointed out that the narrow alleys were the receptacles of every kind of filth which was left to rot in the roadway, while the cellars inhabited by human beings were in no way different from pig-stys. In 1837, with a population of 253,000, the death roll of Glasgow was 31 per thousand; in 1847, with a population of 320,470, it was 56 per thousand; in 1893, with a population of 677,880, the death rate was 23 per thousand; and in 1903 it fell to 18.4 per thousand. That was a proof of what had been done in Glasgow in the way of sanitary education and sanitary work. Proceeding, the President referred to the introduction of a pure water supply to the city in 1859 and the passing of the City Improvement Act in 1866, and also to the establishment of hospitals, a refuse destructor, and the construction of sewers. With a vast population continually increasing, the question of the getting rid of filth had always to be faced, and drainage works were now being carried on. He trusted that when these were completed the city would be able to call on the neighbouring towns to purify and clean themselves and their waters, and that they might look forward to the time when salmon would again disport themselves in the Clyde. A great problem which now had to be faced was the smoke nuisance, which was most necessary to be dealt with, for the sun was the greatest of all sanitary agents, and if the health of the people was not to be deteriorated, they must have that power of recuperation. He knew as a boy that seven miles from Glasgow in the gardens apricots and plums grew, but although the trees were there no fruit was forthcoming now. This was no doubt due to the geographical position, for the smoke generated in Glasgow and around blotted out the rays of the sun. Were it not for what he would term the awful conservatism of manufacturers, he believed that many of the inventions would purify the smoke at not an expensive cost. He trusted the meeting of the Congress would do something to stimulate efforts to get rid of the pall which hung over them. The Institute was doing a great work by increasing the sanitary condition of the country. If they wanted to hold what their forefathers had won, they must keep up the high standard of the population, and one of the agents in this direction was sanitation.

The Lord Provost, in moving a vote of thanks to the President, which was carried, said the death rate of the city was now down to 15 per thousand. They were endeavouring to blot out some of the disfigurements of the city, and the Clyde was becoming purer. The smoke question was a difficult one, for there were commercial considerations to which due weight must be given, but he believed the smoke pollution was preventable and economically preventable.

Sanitary Science and Preventive Medicine.

Section I. of the Congress met in the Medical Jurisprudence Class-Room on Tuesday, under the presidency of Professor Glaister, when papers were read by Professor H. R. Kenwood on the "Practical Disinfection in Rooms and Workshops occupied by Sufferers from Consumption"; by Dr. Raw on "Tuberculosis in Cattle and its Conveyance to Human Beings"; and by Dr. Jackson Clarke, on the cause of small-pox.

Conference of Engineers and Surveyors.

On Tuesday morning a conference of engineers and surveyors to county and other sanitary authorities was held in the Law History Class-Room of the University, under the chairmanship of Mr. W. Weaver, M.I.C.E. (Borough Engineer and Surveyor, Kensington).

In a short presidential address, Mr. Weaver referred to the great increase in the number of incapables amongst the population, and said that sanitation should apply to the individual as well as to his dwelling.

Mr. C. H. Cooper (Wimbledon) followed with a paper on "Card Index as Applied to the Works of Local Authorities." For years he said he had kept his notes on cards, which, being inserted in trays under their different headings, are available for reference at any time, independent of the period over which such notes extend. The saving in time by the adoption of his system was enormous. The author exhibited the cards, books, etc., he used, and explained his system.

Motor Vehicles and Municipal Service.

Mr. E. Shrapnell Smith, secretary and treasurer of the Automobile Mutual Protection Association, read a paper on "Motor Vehicles in Relation to Municipal Service," in the course of which he referred to the great increase in the number of motor-cars, and said this great increase in the popularity of light motor-cars had brought proportionate benefit to roadside interests throughout the land, though its train was chiefly remarkable for one grievous accompaniment—the dust nuisance. The dust problem is admittedly one for every user of the highway, but it should be the permanent concern of the municipal or county surveyor. The remedy is to be found in the gradual laying of metal that has been steeped in tar or other similar liquid. The use of surface treatment *ad interim* can be urged as an expedient only, and not as the final attainment. He advocated the provision of motor-cars for borough and county engineers as time-saving machines, and referred to the trials made by the Liverpool Self-Propelled Traffic Association in 1899 and 1901 of heavier machines suitable for street removal, haulage of material, and refuse removal. These trials were followed by what might be called a commercial experiment in road transport, and operations were carried out in Lancashire with fourteen waggons of 3 tons over a period of twelve months. The result was a breakdown with this weight of cars, but the Association is being maintained with a view to renewed activities when fresh circumstances shall have rendered the scheme more feasible. There were now about 950 heavy motor vehicles at work in the United Kingdom, which was a solid argument to advance in support of the purchase of motors for heavy transport as soon as the new regulations occur. Mr. Smith concluded by submitting the following resolution, which he suggested should be carried by the meeting:—"That this conference of engineers and surveyors to county and other sanitary authorities is of opinion that the advent and increase of motor vehicles on public highways renders it imperative, in the interests of public health, (a) that municipal, urban, and county estimates should in future provide for the use of fixing liquids during dry weather on existing macadamised roads, and (b) that in the construction and repair of macadamised roads the metal should be impregnated before spreading with some cohesive liquid appropriate to the local conditions, and this meeting recommends the Council of the Sanitary Institute to make known these views as widely as practicable."

Mr. Humphreys doubted the wisdom of passing the resolution as it stood, seeing the great disagreement there was as to the best methods of reducing the dust nuisance.

Mr. Cooper suggested that they should merely pass an abstract resolution. The Chairman moved, "That this conference of engineers and surveyors to county and other sanitary authorities is of opinion that the

advent and increase of motor vehicles on public highways renders it imperative, in the interests of public health, that municipal, urban, and county authorities should adopt methods for the prevention of dust during dry weather on existing macadamised roads." When wheel traffic took the place of packhorse traffic the people made the road, and there was not the slightest reason for doubting that engineers would be able to make the roads suitable for the altered needs of the age.

In the course of further discussion there was a general agreement that for dust collection motor vehicles were not economical, and also that in the case of very large towns electric tramways were more suitable than motor buses.

The resolution as moved by the Chairman and seconded by Mr. Mawbey was carried.

Utilisation of Destructor Residuals.

Mr. W. Hillman next read a paper on the "Utilisation of Destructor Residuals," and said that in connexion with refuse-destructors the problem was how to dispose of the indestructible residuum. Assuming he said, that the leading types of destructors are of equal efficiency, and produce a vitreous clinker—with the present high temperatures there is no justification for any other—there are many purposes to which it can be applied, and the object in view is to ascertain the most remunerative. As a filtering medium for sewage works, crushed clinker is unsurpassed, being harder, more porous, and less liable to disintegration than coke. As an aggregate for concrete it is superior to such materials as broken stone or ballast. Ground into mortar it finds a ready sale for building works, and makes an excellent plastering material, provided the iron particles are extracted. It may be crushed or graded for tar paving. For road making rough clinker from the cooling floor makes the best hard core procurable, providing, as it does, a superior drainage bed, tending to keep the road surface dry. A new industry was springing up in the manufacture of bricks, and this seemed to him one of the most satisfactory methods of clinker utilisation. A plant to produce 50,000 bricks per week would cost approximately 3,000*l.*, and the working expenses 30*l.* per week, summarised thus:—Interest on capital and depreciation at 10 per cent., 6*l.*; labour (estimated), 15*l.*; power, 2*l.* 10*s.*; lime, at 10*s.* per ton, 6*l.* 10*s.*; total, 30*l.* Assuming fifty working weeks to the year, this gives the average cost of 12*s.* per 1,000 bricks made. A combination of flag and brick making would be still more profitable—i.e., making bricks and flags alternate weeks, the same preparation plant serving for both purposes. No serious difficulty seems to be experienced with the disposal of the dust, its absorbent qualities being such that up to 30 per cent. of pure carbolic acid can be added, thus making an economical disinfectant for ordinary purposes. The greatest source of inconvenience in a destructor works is the number of tins and discarded metal vessels, inasmuch as they uselessly occupy much valuable cube space. It is possible to reduce them to marketable form at one operation by running off the solder, hurrying off the tin, and then compressing the sheets into "cheeses" with the miscellaneous bits of old iron interposed.

Mr. Mawbey, who opened the discussion, said that his experience at Leicester was that the disintegration of a filtering medium in sewage work it was surpassed by a number of different materials. Then they found they could not make good enough flags to put down in Leicester unless they used a proportion of gravel. With one proportion of granite to two portions of crushed clinker they had certainly got a good flag.

Dr. Willoughby impressed on the Congress the fact that destructors were for the destruction of refuse, and too much ought not to be expected of them as heat producers.

Mr. Cooper thought they could get no better foundation for ordinary macadam roads than clinker from the destructors.

Mr. Hillman, replying to a vote of thanks, said that it was true clinker flags were not things of beauty, but for paving cellars and side streets there was nothing better.

This closed the sitting of the conference.

Conference of Municipal Representatives.

A conference of municipal representatives was held in the Examination Hall on Tuesday, under the chairmanship of Mr. Councillor W. F. Anderson.

The Smoke Problem.

Sir John Ure Primrose (Lord Provost) read a paper on the "Smoke Problem," in which he recalled the fact that, at a Congress in 1896, the problem of smoke pollution and its remedies brought forward and discussed, and he remembered how they listened to Sir Wm. Raw and Mr. A. F. Fletcher, H.M. late C. Inspector under the Alkali Acts, whose addresses did much to attract public attention to smoke pollution and its dire effects. They had travelled during the three intervening years considerably nearer a solution of the problem. He was quite convinced that mechanical science in its application to the proper combustion of fuel, whether fuel be coal or the gas obtained from it, was quite capable of relieving them from nuisance. Further, this much-needed remedy may be obtained in a manner quite consistent with economy, so far as steam production concerned. It was only fair, however, to state that many manufacturers who had hitherto adopted the best structural means they knew of to prevent the pollution, had had their efforts rendered abortive by the absolute carelessness of their firemen. In such cases it appeared to him that the penalty should fall on the absolute transgressor. The domestic boiler also was by no means free from blame in regard to the evil, and he was led to the conclusion that the time might not be far distant when the gas fire would supersede the burning raw coal in the grate.

A short discussion followed, and a vote of thanks was passed to the Lord Provost, on motion of Mr. W. Whitaker (Chairman of Council of the Sanitary Institute), seconded by Mr. A. H. Reid (Chairman of the Board of Examiners of the Sanitary Institute in S. Africa).

The Work of the Plumber.

EX-BAILIFF R. Crawford, LL.D., gave an address on "The Municipality and the Plumber." He said that the plumber is pre-eminently the man whose work is difficult to find or understand. It was hidden work, which might be termed *caevare* to the general public, but which most immediately affects public health. The plumber was the tradesman who in recent times had made persistent efforts to organise himself for a view to legislative recognition, and to secure his trade from the influx of incompetent men who in recent times had taken the place of the old plumber. He said that it might become a protection and a security instead of a menace to the public. A doctor might by incompetence kill his patient quickly, but the unskilful or incompetent plumber might do his work so as to poison a family and imperceptibly a whole family. They were protected against the one, but were open to the mercy of the other. Last year drainage of 1,526 old properties in Glasgow were tested by the smoke test and only 100 were found in order. This was not a satisfactory record, and suggested that a large amount of defective plumbing work still lay undiscovered in city property. He asked if the rates should for all time have to keep up an army of inspectors to insure themselves against the risk of disease traceable to the work of ignorant and incompetent men. Was it not much more reasonable to seek for a condition of the work so closely connected with the public health, which would, by examination and registry, prevent it from being occupied or invaded by the ignorant and the unworthy? Dr. Crawford proceeded to refer to the efforts which the plumbers had put forth in their Registration Bill to secure legislative recognition for their trade and the nature of the opposition which for so many years been successful in opposing it in the House of Commons. In conclusion he said that local and water authorities should render much help to reform by deciding to give preference so far as lay in their power to the employment of registered plumbers against plumbers not registered. He said "That it is necessary to the effective administration of the Public Health and Water Act that the authorities be recommended and enabled to require that the competency of plumbers employed to execute or inspect plumbing work under the regulations of those authorities shall be certified by the Plumbers' Company under conditions appertaining to the registration of plumbers or by such other means as may be set up by statute or by agreement with the Local Government Board."

Mr. Cooper (Aberdeen) asked why the resolution had been altered from the one of notice had been given.

Dr. Crawford explained that the object of the plumbers' Registration Bill was to create a new authority, the Plumbers' Company being the body acting authority up to the present time. Mr. Hind (Stockton-on-Tees) seconded the motion, and pointed out that, while they might be the most perfect plans and most stringent regulations, yet if they had indifferent workmen the whole of the work was prejudiced. The importance of having plumbing work done effectively could be realised when it was remembered that, while decorative and other work was within view, the work of the plumber was hidden away out of the sight of the architect and clerk of the works. This question had been agitated since 1884, and people now giving instructions for buildings were insisting on the sanitary arrangements being as perfect as possible, and this was a proof of the general progress which had been made in the matter. Mr. Robinson (Durham) asked if the effect of the resolution would be that in future a medical officer, surveyor, or sanitary inspector was to be a plumber would be unable to certify as to the sanitary effect of the fittings. Mr. Crawford said that was not so. Mr. Smith (Birmingham) considered that attention should be given to the plumber's work, who was often given work to do while the plumber was enjoying himself in the neighbouring hotel. Mr. Crawford thought the plumber's boy was peculiar to Birmingham, for he had never known plumbing done by the boy. In any case, the object of the proposed registration was to make the plumber responsible for the work he did, and one feature of the movement in connexion with registration was to insist on apprenticeship for plumbers. After some further discussion the resolution was carried.

Housing of the Poor.

Sir S. Chisholm, Bart. (Glasgow), in the course of a paper on "The Municipality and the Housing of the Poor," said that the whole of the science of sanitation might truly be said to be introduced in the home. It was to make the homes of the people sweet and clean that this science had been founded. Had the municipality any responsibility in this connexion, it should the so-called law of supply and demand be left to deal with the question? His answer was not far to seek, because, if the law of supply and demand were left to take its untrammelled action, society would quickly come to chaos and fall back into absolute anarchy. Under the direction of the local authority, many slums had already disappeared and many were still disappearing; whereas, if the matter were left to the landlord and tenant to settle, with need and greed on the one hand and poverty and vice on the other, the homes of the poor would remain the reeking abodes of stilted and death. The housing problem was essentially a complex one, and if it were to be solved there must be better-behaved people, as well as improved housing conditions. The people must live, and live as human beings should live, and no theories, however plausible, should be allowed to stand in the way of the attainment of this end. The municipality could build with a minimum of loss to the community and in many cases with no loss at all. When the necessity arose for this, the municipality acted as neglected to act was preparing for itself day of retribution. Mr. Councillor Burgess (Glasgow) opened the discussion, and opposed the provision of single-apartment houses, as was done by the Glasgow Corporation. Mr. Gleaves (Liverpool) said that in the district he came from, a few miles from Liverpool, he had six-roomed cottages to let at six shillings a week, and if that could be done at Liverpool he did not see why it could not be done at Glasgow. Mr. Lambie (Larkhall) defended the Glasgow Corporation against the criticism of providing re-tenement houses. It was all very well to talk about having three or four roomed houses, but where was the money to come from? Dr. Simpson (Liverpool) corroborated what Mr. Gleaves had said as to six-roomed houses at Liverpool at six shillings a week. In answer to the Chairman, Dr. Simpson said the cost of the ground was 1s. per sq. yd. and the cost of the houses was £150 each. Considerable discussion followed, most of the speakers referring to the dirty habits so prevalent amongst the very poor, and contending that the people themselves must be improved.

The President, in closing the discussion, said he did not wish to provide for those who could earn a sufficient wage to look after themselves, but for that portion of the community who, strive as they would, could not earn sufficient to maintain themselves. They would be materially helped in solving the problem if they had a more sympathetic department of the State to which they might appeal, and sixty years was not long enough in which to spread over the payment for dwellings, houses, and land.

HEALTH CONGRESS AT FOLKESTONE.

The annual Congress of the Royal Institute of Public Health was held at Folkestone from Thursday, July 21, to Tuesday, the 26th inst., many hundreds of members and delegates representing County, City, Borough, Urban and Rural Councils from all parts of the kingdom, port, sanitary, municipal and other authorities, and a number of learned societies, taking part, and the Earl of Radnor, lord of the manor of Folkestone, being President of the Congress. The inaugural meeting was held on Thursday morning in the Pleasure Gardens Theatre, which was attended by the President (Professor W. R. Smith) of the Royal Institute, and some of its leading officials, and the chief officials of the Congress, the company including, besides the Earl of Radnor, Sir Albert Sassoon, M.P. for the division, the Mayor of Folkestone, Chairman of the Executive Committee, the Mayors of Hythe, Salford, and other towns, and many municipal representatives. The Mayor of Folkestone opened the proceedings, followed by the President of the Royal Institute, who, after a brief address, in which he alluded to some of the leading objects of the Institute, invested the Earl of Radnor with the badge of office as President of the Congress, and presented him with a diploma as Honorary Fellow of the Institute. In an extempore address the Earl of Radnor welcomed the delegates to their beautiful town, expressing the hope that the deliberations of the many experts assembled would lead to very satisfactory results. The meeting was also addressed by Sir Edward Sassoon, M.P., the Bishop of Dover, the Mayors of Hythe and Salford, Sir Charles Cameron, M.O.H., Dublin, and Mr. Councillor Todd, Chairman of the Health Committee of Edinburgh.

The work of the Congress was distributed over six sections, including a Ladies' Section, presided over by the Countess of Radnor. One or two of the sections sat in the afternoon, but most of them commenced the sectional proceedings on Friday morning.

Section C.—Engineering and Building Construction.

The President of the section, Mr. Wm. Harpur, M.Inst.C.E., Borough Engineer, Cardiff, in his inaugural address devoted himself chiefly to two points, the status of the building surveyor, and the necessity of amendments in the building regulations. It was a matter of great regret that for the office of surveyor, with the hundred and one important duties he was called upon to perform, no diploma or proof of qualification was imperative. The appointment depended on the good will of the council or local authority, who might, if they chose, appoint to the office a farmer, a tailor, or a carpenter. The surveyor ought to be an officer possessing due qualifications, and working under the authority of government. In order to secure duly qualified men to fill the office the salaries must be adequate. At present they were quite inadequate to command the services of the right sort of men. With regard to the building regulations, in most cases the sanitary authority was unable, under the by-laws as they stand, to carry out the provisions of the Housing Acts, except at enormous cost. In dealing with insanitary areas and in rehousing families that had been dispossessed, they were harassed by a multitude of restrictions and conditions, so that it became impossible for the local authority to compete with the builder. As soon as it became known that the local authority proposed to build, the price of every eligible site was run up and costs were multiplied so that the builder could always let his houses at less rent than the local authority could do without throwing a burden on the ratepayers. The costs would be reduced if the requirements of the model by-laws were relaxed, and if the Government would assist the municipality in getting better terms for loans. The cost of sites within

the boundaries of large towns was prohibitive, and where building operations were active outside the boundary, the local authority had no control over the class of houses erected, or over the width or direction of new streets. A much needed amendment was the giving of powers to local authorities promptly to extend their boundaries where new streets and buildings were likely to be wanted. With regard to the model by-laws of the Local Government Board, where they were intelligible, they were impracticable and incomplete. The maximum width for streets of 36 ft. or even 40 ft. was now quite insufficient with all the new means of locomotion. In many cases landlords were broad-minded and generous, and readily acceded to the demand for wider streets. But to depend upon the generosity of landlords was not enough. The local authority ought to be able to obtain, through a reformed Local Government Board, the right to fix the width of streets at such a maximum as circumstances might require. At present little townships are allowed to spring up all round the larger towns under all sorts of undesirable conditions, and defects have subsequently to be remedied at enormous cost. Government regulations ought to make it easy for a municipality promptly to extend their boundaries so as to bring new districts under proper jurisdiction.

A vote of thanks to the President of the section was proposed by Mr. H. G. Whyatt, Borough Engineer, Grimsby, who said he agreed in the main with the views expressed in the inaugural address, but upon one point he differed from the President. He agreed that the requirements of the Local Government Board needed modification in numerous cases to make them practical, but he did not agree in the suggestion that the special by-laws governing the erection of dwellings for the working-classes should be relaxed. The members of the Local Government Board should be more practical, and should make themselves better acquainted with the special difficulties encountered in different localities that made the model by-laws inapplicable in many cases, and rendered modifications absolutely necessary. But whatever concessions might be obtained by local authorities would at once be claimed by the jerry-builder. If the by-laws were relaxed, or if they had no by-laws, they would be unable to control the jerry-builder.

Mr. Councillor Musgrave (Rugby), in seconding the vote of thanks, said we must not seek to relax the requirements of the by-laws in the interest of the jerry-builder. He should oppose the interference of the Local Government Board in the appointment of surveyors. On many occasions the Local Government Board had proved itself incompetent. The model by-laws were much in need of amendment. As they stood they were a mass of verbiage, the interpretation of which would puzzle a Philadelphia lawyer.

The vote having been accorded by the section, Mr. Harpur replied. He said he did not suggest that there should be any retrograde action on the part of local authorities, and perhaps, instead of the word relaxation, he ought to have used the term modification. The main point was that, with all the expenses that have to be incurred by a local authority in building cheap houses under the Housing Acts, it became impossible to compete with the builder. The exaction of a height of 10 ft. and of 14-in. walls for cheap cottages of two floors was unnecessary. The scantling of the timber prescribed was often also too great. For such cottages, 9-in. walls were quite thick enough. The expense of building such cottages must be reduced. The term for the repayment of loans had been extended by the legislature from fifty years to eighty years, but the Local Government Board would only grant the extended term for freehold property. Local authorities ought to have the benefit of improved legislation to the fullest possible extent. It was an impertinence on the part of the Local Government Board to put obstacles in the way when the law had granted eighty years for the repayment of loans. Again, with the assistance of Parliament, loans might be obtained by local authorities on much better terms. Mr. Musgrave objected to the interference of the Local Government Board in the appointment of surveyors. But there should be some authority to control those appointments, and if the Local Government Board were reformed and would exercise its powers, it might render great services to the public in this and other matters.

Seaside Sewage Disposal.

The first paper called for was on "Seaside Sewage Disposal," by Mr. A. J. Martin, of Westminster. A town possessing a well-chosen sea-outfall had a much less difficult problem to face in the disposal of its sewage than an inland local authority. An efficient sea-outfall gave a nearer approach to finality than any other mode of disposal yet in vogue. South Wales and Monmouthshire were laying trunk sewers to take the sewage from their river valleys and towns to the Bristol Channel, and for London itself a scheme had been propounded to carry the sewage 56 miles across the whole breadth of Kent to an outfall at Dungeness Point. An instance of an efficient sea-outfall was found at Torquay, which for the past forty-five years had discharged its sewage into deep water in the English Channel. Very few seaside towns were so happily situated as Torquay. In most cases the absence of adequate fall or other causes necessitated preliminary treatment of some kind for the sewage of seaside towns. The efficiency of treatment by the removal of the solid matters in suspension, and of treatment by the septic tank system, were compared in the paper, and the following conclusions were arrived at:—

"1. That under certain exceptionally favourable circumstances the discharge of untreated sewage may yield perfectly satisfactory results.

"2. That under ordinary conditions the separation of the solids is desirable.

"3. That this may be partially accomplished by screening, and more effectually by sedimentation, precipitation or septic action.

"4. That under ordinary conditions septic treatment will be most satisfactory.

"5. That the effluent should, if possible, be discharged continuously.

"6. That if storage is inevitable, it should take place in a tank rather than a sewer, and that the opening and closing of the valves should be effected automatically.

"7. That the utmost care should be taken in selecting the point of discharge."

The President proposed a vote of thanks to the reader of the paper. He was engaged in carrying out the trunk sewer for Monmouth, and three years ago had been interested in a scheme before Parliament for a sewer of 4 ft. 6 in. diameter three miles away. They knew they should meet with opposition, and it had been necessary to be prepared for every difficulty. They could not obtain the necessary conditions for a continuous discharge, and would have to discharge on the top of the tide. They had to discharge a sewer containing 4½ millions of gallons in four hours. But where conditions were favourable, a continuous discharge was the most desirable.

The motion having been seconded, Colonel Brownridge, borough engineer, Birkenhead, supported the motion. He was glad to be able to say that the works on the Mersey, with which he was connected, permitted of a continuous discharge. They could discharge into the Mersey at all states of the tide, but he did not know if that would be practicable in cases where all the sewers concentrated into one. If possible they should obtain a continuous discharge into the sea. It was possible to trace the course of a stream of sewage at a great distance by means of birds. When the sewage could be broken up and rapidly mixed with sea-water, it must be better. He did not propose to discuss, where treatment was necessary, whether it should be septic or otherwise. The main thing was to provide for the discharge of an effluent under good conditions, and if they had the advantage of being able to select the method of treatment, the disposal of the sewage of a seaside town would not offer much difficulty.

Mr. Martin said the discussion had left him no points to reply to. He was gratified to find so kind a reception given to his paper, which was on a subject upon which it was not easy to say anything new.

Sewage Discharge into Estuaries of Small Tidal Rivers, Etc.

A paper of much interest on a cognate subject was read in section B, over which Dr. Edward E. Klein, of London, presided. The paper was prepared by Dr. A. G. Russell Foulerton, Director of the laboratories of Middlesex Hospital, to show the results of the discharge of sewage into the estuaries of small tidal rivers and on the coast, on the health of the populations residing near the outfall. The paper first dealt with the injury to fish and fishing, and especially to the oyster industry, through the pollution of tidal waters by sewage and the possible danger of typhoid through the consumption of shell fish, and then considered the danger of the direct causation of typhoid among the communities dwelling near the

sewage-polluted foreshores of rivers and estuaries. The report of a commission appointed last year to consider the subject, issued in January, stated that some alteration of the laws dealing with the pollution of rivers was required. The investigations of Dr. Foulerton were chiefly in Sussex, and extended to Chichester Harbour, a village of 241 inhabitants at the mouth of the Sussex Ouse, a town of 6,770 population, about 8 miles from the outfall of the sewage of Lewes, two large towns respectively of 45,344 and 36,535 population, twelve urban districts and twelve rural districts in the county. The general conclusion arrived at is, that the danger of the air-borne infection of typhoid from the sludge on the banks of tidal rivers into which crude sewage has been discharged, has been overlooked. Dr. Foulerton thinks it unfortunate that the "Prevention of Rivers Pollution Act" allows such discharges as are not a nuisance to the eye or the nose. Leaving to the future the question of crude sewage discharges on open coasts, he has no doubt that danger to public health exists through the discharge of crude sewage into narrow estuaries to settle on the foreshores of rivers. In the village of 241 inhabitants there had been fifteen cases of typhoid in twelve years. Typhoid is prevalent in the town of 6,770 inhabitants a few miles from the point on the Ouse where Lewes discharges its crude sewage. It only requires a fly to feed on the sewage polluted mud and then on milk or other human food to provide an effectual means for propagating typhoid. The morbidity rates observed in the two large towns referred to, the twelve urban and twelve rural districts, show a contrast which is very significant. The morbidity rate for typhoid was for the whole county 4.08, for the two large towns 6.03, for the twelve urban districts 4.7, and for the twelve rural districts 2.5. Of fourteen urban districts the towns with the highest morbidity rate were the least crowded; six on rivers or coasts showed the highest, and six inland towns showed the lowest morbidity rates. These facts prove, in the opinion of Dr. Foulerton, that our ideas of the causation of typhoid require to be extended, and that we must reconsider the advisability of allowing the discharge of large quantities of crude sewage in the neighbourhood of towns situated on our tidal rivers and on our coasts.

Conservation of Subterranean Water Supplies.

A paper, prepared by Mr. W. H. Maxwell, Borough and Waterworks Engineer, of Tunbridge Wells, was read by Mr. Nicholls, of the hon. sec. of the section, in the absence of the author through illness. The subject was "The Conservation of Subterranean Water Supplies." In fifteen of the largest towns of Kent and Sussex, with an aggregate population of 687,700 people, the sole or the main sources of water supply are subterranean. Hence the question of maintaining at all seasons such sources of supply becomes of the utmost importance. This was so clearly recognised in 1902, when the Cray river disappeared, through the excessive pumping (so it is alleged) of a London water company, that an Underground Water Preservation Association was formed in that year with the object of preventing, if possible, the excessive abstraction of underground water. Diagrams accompanying the paper showed some of the devices by which the natural storage of underground water may be increased, and the escape of underground water through natural outlets can be diminished.

In the absence of the author of the paper it was not discussed before the section adjourned.

Disposal of Waste of Public Institutions.

On Monday the proceedings of the section were resumed with the reading of a paper on the "Disposal of the Waste of Public Institutions and Works," by Mr. W. Francis Goodrich, of London. The great improvements which had taken place in recent years in the construction of Municipal Refuse Destructors had led medical men and sanitarians to look for a small destructor for the purpose of burning the waste of hospitals and other public institutions which, from the nature of the case, required to be as perfect as possible. Noxious fumes or nuisance of any kind could not be tolerated within the walls of such institutions. The defective features of the older types of destructors were pointed out in the paper. The adoption of forced draught had been the means of effecting great improvements in the smaller as well as in the large municipal refuse destructors, and a temperature of 2,000 deg. Fahrenheit being now easily maintainable, no nuisance of

any kind was now possible. A number of photographs accompanied the paper, showing various types of small destructors, one designed for a small London isolation hospital, with a destroying capacity of only ½ cwt. of refuse an hour. Another illustration showed a portable destructor, with a destroying capacity of 5 tons per day. Types of small destructors for tra refuse were also illustrated in the paper.

Before the discussion was entered upon, second paper was read on the same subject. It was entitled "Disposal of Refuse," by Mr. E. Watson, A.M.Inst.C.E., of Leeds. Having on previous occasions expounded the principle of an efficient refuse-destructor should be constructed, Mr. Watson, in the present paper described the leading features of three types of destructors on which he had recently been engaged—one at Brussels, opened last year for a capital city, which was of the large kind; a plant of moderate size, with two cells, for the town of West Hartlepool; and small one of three cells erected at Folkestone.

The plant at Brussels was one of two or four cells, in two groups of twelve cells each, which embodied all the most recent improvements. The cells are of the back-to-back "top-fed" type, each capable of burning from 8 to 10 tons of refuse per day or a total capacity of 240 tons per day. Special difficulties to be met in the case of Brussels were the getting rid of immense accumulations of refuse formerly sold to farmers, but of late years discarded for agricultural purposes, and the sparseness in the refuse of combustible matters, such as cinders. It had long remained doubtful whether the expense of providing coke or other fuel to help in the cremation of the refuse would be necessary. Mr. Watson, in his paper, stated that there has never been any difficulty in keeping steam either in summer or winter, although, owing to climatic conditions and an extensive use of gas cooking stoves, the refuse of Brussels contains far less combustible matter than is the case in any ordinary English town.

The plant at West Hartlepool was of two periods, the fires in the original six cells being lighted in 1901 and those of the six extension cells in 1903. The contract for the new plant as well as for the old was offered to open competition, the committee being determined to obtain in the extension plant the best furnace without regard to what they had in use already. The original plant was guaranteed to evaporate 1 lb. of steam per lb. of refuse, the new plant was guaranteed to evaporate 1.25 lb. of steam per lb. of refuse burned. In both cases guaranteed evaporation was exceeded. The evaporation realised in the old plant averaged 1.25 lb. of steam per lb. of refuse and in the new plant it rose to 1.52 lb. The cost of labour, 10d. per ton of refuse consumed, and in new plant only 9d. per ton.

The Folkestone plant, which has just been completed, differs in several important respects from the others described. The cells are capable of dealing with 15 tons of refuse per day every twenty-four hours. They have an enlarged grate area of 42 sq. ft. per cell, by which it is expected that considerable economies will be effected as compared with the standard. The arrangements permit of an increase in size of the destructor when the growth of borough demands such a step. The boilers are made ample for an enlarged plant, and another boiler can be added when required. The author, in concluding his paper, expressed gratitude for valuable suggestions made by Messrs. E. Putzeys, Chief Engineer of Brussels, Mr. J. W. Brown, M.I.C.E., of West Hartlepool (late Borough Engineer), and the Borough Engineer of Folkestone, Mr. A. E. Nicolson, A.M.Inst.C.E., with whom he has collaborated in the creation of the several plants, and to whom are due in large measure the success achieved in the respective cases. To illustrate the paper a large number of enlarged photographs were thrown upon the screen, each of which being described by Mr. Watson as it appeared.

The President proposed a vote of thanks to both the readers of papers. He would like Mr. Watson to tell the section why the Babcock-Wilcox boilers were, in the case of destructor, preferred. Did they possess any advantage over other types of boilers?

Mr. Councilor Atkinson (Hull) seconded the motion. The section was deeply indebted to both these experts. In Hull they had a good deal of experience of destructors.

r population of 250,000 they had two destroyers, one of them of an old and very primitive type. They had adopted Horsfall's destroyers, after a very full consideration, at a cost of £22,700. In reply to the President, Mr. Mott perhaps be allowed to say that the Babcock and Wilcox boilers were adopted because they were the most economical. The destructor at Hull had twelve cells, with room for more. Last year they had burned off 15,577 tons of dry dust, which was collected and delivered to the destructor works of the corporation. They supplied steam for electric lighting and the crushed clinker was used with a disinfectant and used as a deodoriser, thus effecting a great economy.

Colonel Brownridge (Borough Engineer, Birm.) asked the authors of the papers if they could state the average cost of a destructor for a long period. Too often the cost of a destructor was given over too short a period, and the works were new and everything was in order the cost for repairs was naturally small, but as the years went on the cost for repairs became greater and greater, and therefore, as an engineer, he would rather have the cost of maintenance stated for a lengthened period. He happened to have been mixed up in the early experiments with destructors, which had led to the introduction of high temperatures. He had followed the developments and the improvements made from time to time by rival manufacturers. A healthy rivalry between different inventors could only result in benefit to the community. The claims of inventors were sometimes misleading. They were not concerned to know how much water had been evaporated. They wanted destructors to destroy the refuse of towns, but if they could do that object, and could get other commercial results, so much the better. The duty to be looked for in a destructor was that it should destroy refuse in a satisfactory manner.

Mr. Alderman Cohen (Hull), in supporting the paper of the author, said he was a decided advocate of the destructor. He was at the laying of the foundation-stone of the first destructor erected in this country, and he had watched with interest the scientific improvements introduced from time to time in the later types. In the case of most towns a great economy could be effected by the use of the destructor in the disposal of their refuse.

Mr. Councillor Short (Bootle) said Mr. Mott's paper was very interesting as showing the improvements made in the application of the destructor to the production of a good destructor. He hoped that, by means of such papers, they would get the very latest up-to-date destructor. The question was increasingly important to the municipal administrator, whose chief concern was to safeguard the health of the people and to save life.

Mr. Alderman Burridge (Bedford) said that what they wanted to find was a destructor which would do its work without causing a nuisance. He would avoid creating a nuisance by putting up a destructor in a central situation, they were advised to go a mile or two out. But this would involve great cost for cartage, and he hoped a destructor would be produced some day which could be erected in a central situation without itself being a nuisance and a danger to health. Mr. Walker Smith (Borough Engineer, Barrow-in-Furness) thought their thanks were equally due to the readers of both the papers. How were they to gain instruction unless firms would come to these meetings to give them the benefit of their experience? A previous speaker had explained that here in section C they had only two papers before them and that of the President. Was it worth the while of their authorities to send them to a Congress which had so little before it? Might not the section be amalgamated with the Sanitary Congress?

The President ruled that the remark was out of order. They might as well ask why the papers of both bodies should not be read before the Association of Municipal Engineers. Mr. Turley (City Surveyor, Canterbury) said he would like to know what was the average cost of working a destructor. At Canterbury the cost for repairs to the destructor was enormous. They had a destructor erected only three or four years ago, and already the cost for repairs was getting rather alarming. Was it always wise to go in for high temperatures? He thought it was wrong to seek after high temperatures for the sake of saving the rates by utilising the destructor for electric lighting. If the temperature was less, they might be able effect-

nally to destroy the refuse and save a good deal on the cost of repairs.

Mr. Morrall (Mayor of Bridgnorth) said they must get their information from gentlemen who possessed it. They wanted to determine which destructor was the most suitable for their requirements. He would like to know what would be the first cost of a destructor for a town of 10,000 and for one of 20,000 inhabitants, and how much they might expect to incur for repairs. The reported enormous cost of repairs at Canterbury was not encouraging.

Mr. Whyatt (Borough Surveyor, Grimsby) said he would rather like to dissociate himself from the remarks of some of the previous speakers. Who else was there to tell us what we require to know if not the manufacturers? It was a decided advantage to hear their views. He should certainly apply Mr. Goodrich's suggestion as to forced draught to small hospital destructors. At present these destructors were usually of low temperature, and therefore gave off foul effluvia. The next he had to construct should be adjoining the laundry, and he would use a forced draught. With regard to the fewness of papers, was it not to their own discredit rather than that of the Institute? There was now no nuisance from the chimney of a well-built destructor, and it was better to put it in the centre of a town. A far greater objection to a distant site was that the difficulties of inspection were increased. When the destructor was only a few hundreds of yards from your office you could find time to drop in when your visit was not expected; but if three miles away, your visits would be fewer and more or less expected. At the worst there was only a burnt smell perceptible, and as the wind varied a good deal at Grimsby each part of the town got it in turn.

The President of the section, before calling upon the readers of papers to reply, said the subject they had been discussing was one of great moment at the present time. The authors of the papers had treated it in an impartial manner, and he had great pleasure in tendering them the thanks of the section. Personally he was sorry that there were not more papers, but there were other sections sitting, and all the sections were open. It was a pity that Mr. Smith had not himself given them a paper. With regard to another suggestion that had been made, he would only say that this Institute would always take its own course.

Mr. Goodrich was then called upon to reply. He said a delegate in the centre of the room (Colonel Brownridge) had asked for an estimate of the cost of maintenance of a destructor over a considerable period. He was not able to give the required information with regard to trade refuse destructors. The man in charge would have other duties to perform, and therefore it would be difficult to say how much was due to the destructor. With regard to the cost of the destructors he had described, a small destructor to destroy from 56 lb. to 1 cwt. of refuse per hour would cost from 75l. to 100l. The larger type would cost from 200l. to 300l. The portable destructor to burn half a ton per hour would cost about 500l. With regard to papers prepared by manufacturers, he would reply by stating what had recently taken place at a joint meeting of British and American Mechanical Engineers at Chicago. Two papers were read on this subject, upon which the American engineers were anxious for information. One which was read by a London engineer was so full of commonplaces and inaccuracies as to be pronounced ridiculous. Instead of being informed, the American engineers would have been misled had there not been another paper on the same subject read by the representative of a manufacturer. The reader of the latter paper, which was very helpful to the American engineers, was Mr. George Watson, brother of Mr. F. L. Watson, whose paper they had just heard. With regard to the question of Mr. Turley, of Cautehrury, it was not to him a matter of surprise that high-temperature cells in a destructor put up four or five years ago should be in need of some repairs.

Mr. Thornley (St. Pancras), representing the Metropolitan Asylums Board, said his experience of small destructors for isolation hospitals was not so favourable as that given in the paper read before the section. In the case of a destructor of which he had experience, he found it in continual need of repairs ever since it was erected. He complained that the papers before the section were private. How could he inform his colleagues if the information was not to be published? It was necessary too that they should have some more independent testimony.

He wanted the testimony of somebody not connected with the destructor manufacture.

Mr. F. L. Watson, in reply to the President's question with regard to the Babcock and Wilcox boiler, said he could not affirm that there was any very considerable economical advantage in the use of the Babcock and Wilcox boiler over boilers of the Lancashire type, for example, but it was more convenient. If the two types were equally suitable to the work to be performed, the results obtained would be about equal.

A delegate asked whether it was not the fact that the Babcock and Wilcox boiler was a more rapid steam-raiser than the Lancashire boiler. The question was not answered.

Mr. Watson, continuing, said it was not easy to give an estimate of the cost of maintenance of destructors over long periods. He must refer his questioner to the reports of municipal authorities. The cost of a destructor for a population of 2,000 would be from 2,500l. to 3,000l. Refuse varied so much in character that it was difficult to give an exact estimate. If a town had a good destructor they would not have any noxious smell. In saying that he did not imply that there was only one form of good destructor. There were several firms who made good destructors.

The proceedings of the section then closed.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Board of Architectural Education.

THE following additional appointments as advisory members have been made:—

Sir Isambard Owen, M.D., to represent the University College of South Wales and Monmouthshire; Professor Elsey Smith, to represent King's College, London.

Visit to Newcastle-on-Tyne.

The following arrangements have so far been made for the Institute visit to Newcastle-on-Tyne, where the annual dinner will be held on Friday, October 7.

Members will be welcomed on their arrival at Newcastle on Thursday evening, October 6, by an influential local committee at the County Hotel, Newcastle, which will be the headquarters of the Institute during the visit.

On Friday, October 7, the Right Worshipful the Mayor (Mr. Alderman A. P. Anderson) will receive the members at the Council Chamber at 10 a.m., and deliver an address of welcome on behalf of the city of Newcastle.

The members will then adjourn to the lecture theatre of the North of England Institute of Mining and Mechanical Engineers, where the President of the Institute will take the chair, for the purposes of a conference on matters of interest to the profession. The Cathedral Church of St. Nicholas and Trinity House will be visited during the morning.

At the conclusion of the conference the members of the Northern Architectural Association will entertain the visiting members at luncheon at the County Hotel.

Arrangements will be made to enable members to visit in the afternoon "Jesmond Dene House," the residence of Sir Andrew Noble, K.C.B., and "Jesmond Towers," the residence of Mr. Charles Mitchell, returning through Jesmond Dene.

In the evening, at 7.30, the annual dinner of the Institute will be held at the County Hotel.

On Saturday, October 8, arrangements will be made (for those who desire to do so) to visit Hexham Abbey and the Roman Station at the Chesters, Chollerford, under the guidance of local members.

Members will be able to return to the south via Newcastle, or those who prefer to do so can proceed to Carlisle and the Lake District, and return by the West Coast route.

A handbook is in course of preparation, containing full information as to hotels, train times, places of rendezvous, etc., and will be sent to any member who decides to attend the meeting. *Seventh International Congress of Architects, 1906.*

At the closing meeting of the General Committee of the Sixth International Congress, Madrid, 1904, the following were appointed as British members of the Permanent Committee of the International Congresses of Architects:—Mr. John Belcher, A.R.A., Mr. Aston Webb, R.A., Mr. T. E. Collett, Mr. Henry T. Hare, Mr. Alexander Graham, Mr. John Slater, Mr. Leonard Stokes, Mr. John W. Simpson, and Mr. W. J. Locke.

The Council of the Institute have appointed the above to be the Executive Committee of the

estate, Cantarbury-grove, West Norwood (Mr. J. Wilson).—Agreed.

Wandsworth.—That an order be issued to Messrs. Lucas and Sons refusing to sanction the formation or laying out of new streets for carriage traffic out of the western side of Tooting Bec-road, Upper Tooting (for Messrs. F. W. and E. Lucas and H. Erichsen).—Refused.

Lewisham.—That an order be issued to Mr. H. Langton refusing to sanction the formation or laying out of new streets for carriage traffic on land abutting upon the south side of Southend-lane, and east side of Worsley-bridge-road, Lewisham.—Refused.

Formation of Streets and Line of Frontage.

Woolwich.—A deviation from the plans approved for the formation of Bereta-street, Foots-crays-road, New Eltham, and sanction to the creation of buildings on the western side of Foots-crays-road, northward of Bereta-street (Mr. G. Busb).—Consent.

Space at Rear.

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of four houses on a site adjoining No. 123, Leahurst-road, Lewisham (Mr. J. Johnson).—Consent.

Paddington, South.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of residential flats on the north side of Moscow-road, Bayswater, between Palace-court-mansions and the Greek church, with open spaces at the rear (Messrs Gordon and Gunton for Mr. Raffety).—Consent.

Means of Escape from the Top of High Buildings.

Holborn.—Means of escape in case of fire on the fifth story of Nos. 112 and 113, High Holborn, for the persons dwelling or employed therein (Mr. A. Burr).—Consent.

Buildings for the Supply of Electricity.

Poplar.—For an addition to the transformer station at Glengall-road, Poplar (Mr. H. Heckford for Poplar Borough Council).—Consent.

The recommendations marked + are contrary to the views of the local authority.

Illustrations.

SCULPTURE FROM THE PARIS SALON.



We illustrate this week two of the best works in sculpture which were exhibited at the Paris Salon this year. We should have been glad to have given them earlier, but the photographs of the year's sculpture which are readily procurable at the time of the Salon, and are sold in the Palais des Beaux-Arts, are never those of the best sculptural works of the year, but of those which appeal to popular taste.

M. Levasseur's "Nymphé" is one of the class of works which aim simply at the realisation of beauty of form, without any special intellectual meaning being attached to the work; nor can sculpture, perhaps, be better employed than in producing a thing of beauty, which indeed, rightly regarded, has its own spiritual significance. No one has produced finer work of this class than M. Gustave Michel, the author of the other figure illustrated; but in this case he has chosen, as French sculptors sometimes do, to express through the medium of sculpture an intellectual idea—the effect on human feeling of the contemplation of the infinity of space. The figure suggests an astronomer who has been considering the orbits of the planets (see the chart of ellipses and the compass), and is carried beyond them to the contemplation of the infinity of space.

We might attach to it, as a motto, George Herbert's verse:—

"O rack me not to such a vast extent|
Such distances belong to Thee;
The world's too little for Thy tent,
A grave too big for me."

[NEW] CREMATORIUM, SHEFFIELD.

This building is being erected by the Sheffield Corporation at their City-road Cemetery, and forms an annexe to the existing chapel on the unconsecrated portion of the cemetery. The chapel, together with the remainder of the cemetery buildings, was the work of Messrs. M. E. Hadfield and Charles Hadfield, and was carried out in 1880.

The new building takes the form of a square chamber, 36 ft. by 36 ft. inside, to accommodate two cremating furnaces of Messrs. Simons, Ltd.'s latest type; only one is being installed at

present. The building is entirely fireproof, being roofed with an octagonal dome of stone ribs and concrete, covered with roofing slabs of artificial stone. It terminates in a stone lantern which is designed to provide both light and ventilation, and which also serves to enclose the main furnace shaft.

The building is being erected for the Corporation by Messrs. D. O'Neill and Son, contractors, from the design of Mr. Charles Hadfield and Mr. C. M. Hadfield, the joint architects.

SHEFFIELD POOR CHILDRENS' HOLIDAY AND CONVALESCENT HOME, HOLMESFIELD, DERBYSHIRE.

This building is proposed to be erected at Holmesfield, about seven miles from the centre of Sheffield, on a sloping site commanding a beautiful view of the Cordewell Valley. It is intended mainly as a summer holiday home for about eighty of the poorer children from the Sheffield elementary schools, boys and girls being sent alternately. It will also be used as a convalescent home throughout the year for a limited number of children.

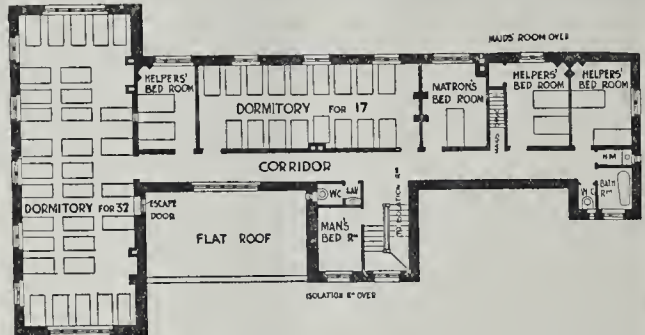
The materials proposed are irregularly coursed local stone, with ashlar dressings for the lower portion, and roughcast rubble walls for the upper portion. The roof will be tiled.

The architect is Mr. H. L. Paterson, Sheffield.

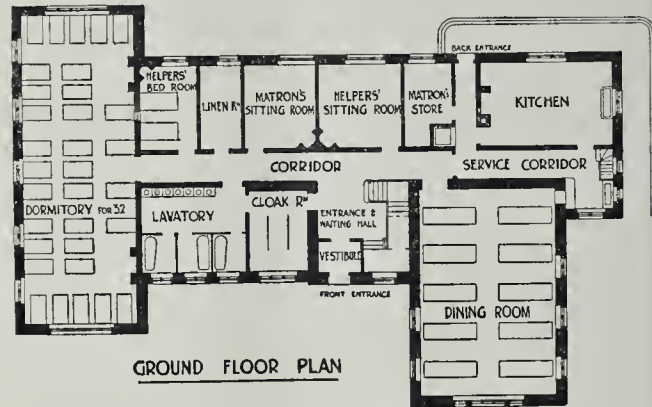
HOUSE AT WINDERMERE.

This building is intended to serve the joint purpose of a residence for Mr. R. R. Mawson, the head of the firm of Mawson Bros., nurserymen and garden furnishers, and also as central offices for the various nurseries and other departments of the firm.

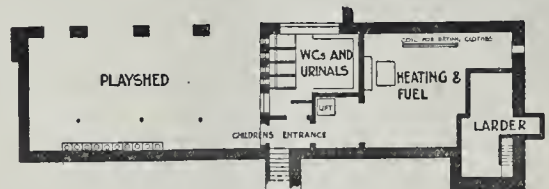
It is to be built adjoining the Rayrigg Wood, and the Rayrigg nurseries, according to the best Westmorland traditional methods of building—native rock roughcast and lime-tinted, with very little in the shape of dressings except sills and coping and steps; and to be roofed with the pale blue-grey Coniston slates. The aim throughout is to obtain a quiet restful feeling from large masses of tone or sober colour as regards both house and garden; the needed variety and brightness in colour being obtained from a few herbaceous borders filled



FIRST FLOOR PLAN



GROUND FLOOR PLAN



BASEMENT FLOOR PLAN



Sheffield Poor Childrens' Holiday and Convalescent Home, Holmesfield. Plans.



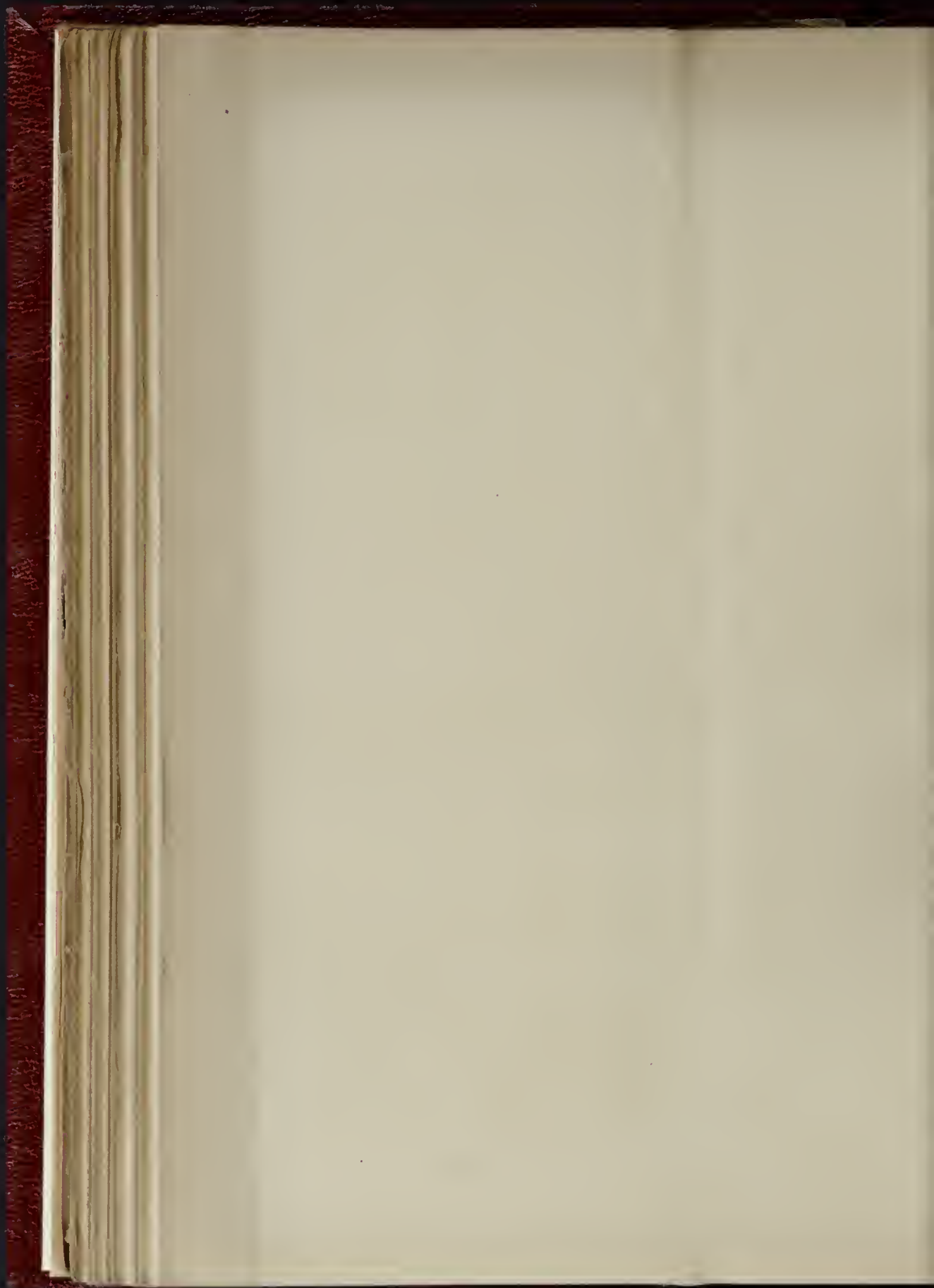
THE PHOTOGRAPH BY MR. J. H. & S. EAST-HARDING STREET, FETTER LANE, E.C.

SCULPTURE "NYMPHE À LA SOURCE"—M. H. L. LEVASSEUR, SCULPTOR.
(EXHIBITED AT THE PARIS SALON).



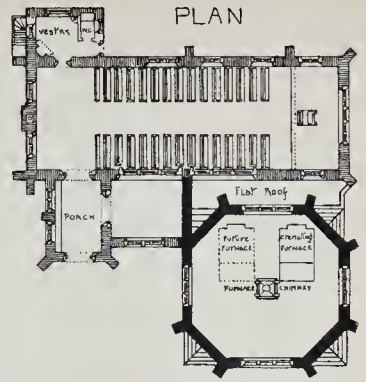
THE PHOTOGRAPH BY MR. J. H. & S. EAST-HARDING STREET, FETTER LANE, E.C.

SCULPTURE, "EXTASE DE L'INFINI"—M. GUSTAVE MICHEL, SCULPTOR
(EXHIBITED AT THE PARIS SALON.)

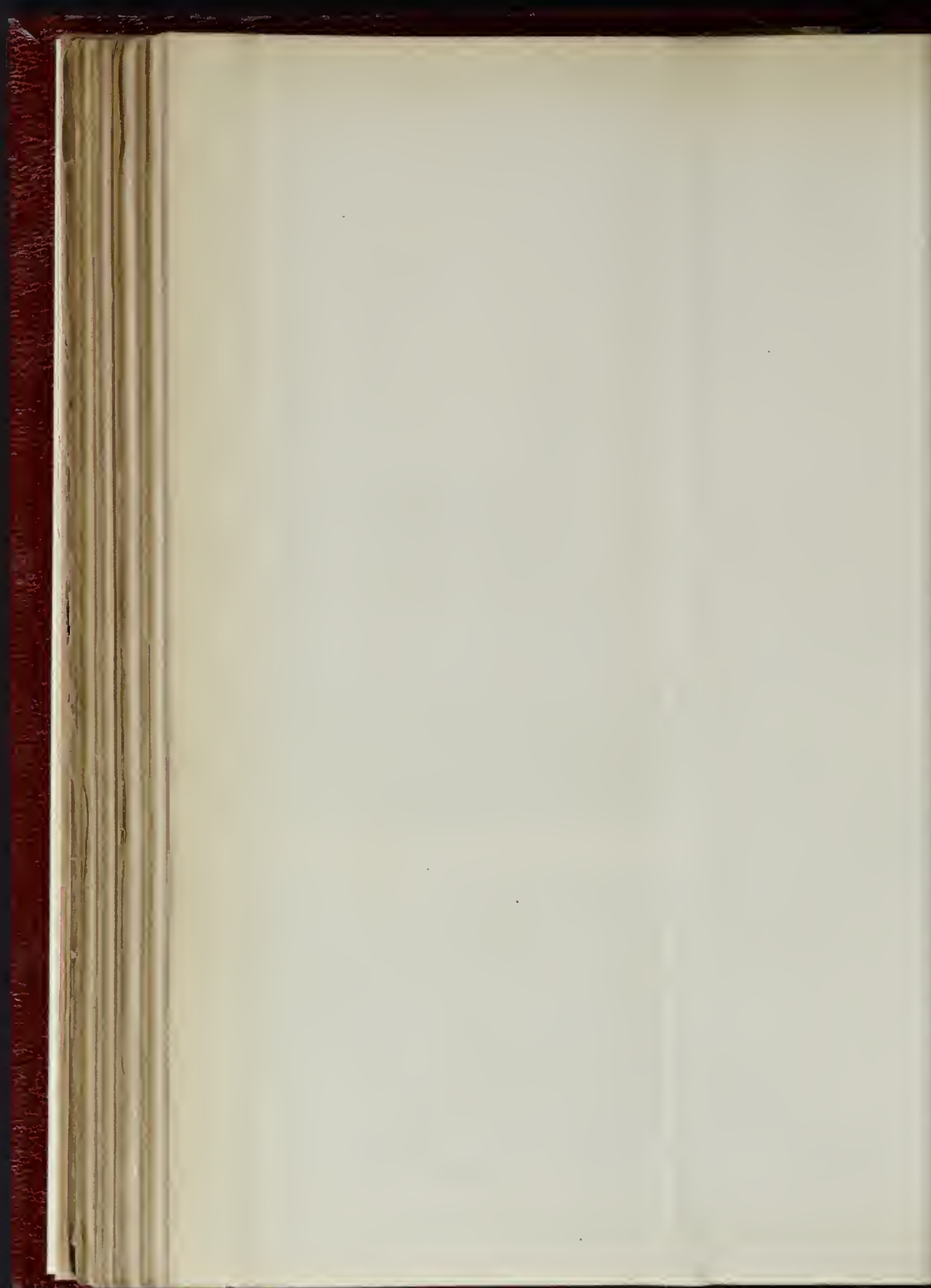


CREMATORIUM ++
 CITY ROAD CEMETERY
 ++ SHEFFIELD

C. HADFIELD & C. M. HADFIELD
 ARCHITECTS - 1909



Percy Washburne Del.





H. Paterson del.

VIEW OF ENTRANCE FRONT.
SHEFFIELD POOR CHILDREN'S HOLIDAY AND CONVALESCENT HOME, HOLMESFIELD, DERBYSHIRE.
MR. H. L. PATERSON, A.R.I.B.A., ARCHITECT.

THE BUILDER, JULY 30, 1904



H. Paterson del.

VIEW OF FRONT OVERLOOKING THE VALLEY.
SHEFFIELD POOR CHILDREN'S HOLIDAY AND CONVALESCENT HOME, HOLMESFIELD, DERBYSHIRE.
MR. H. L. PATERSON, A.R.I.B.A., ARCHITECT.

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PHOTO SPRAGUE & CO. 4 & 5 EAST MADISON STREET, PETER, LANGE & CO.

RESIDENCE AT WINDERMERE.—MR. T. H. MAWSON, HON. A. R. I. B. A., ARCHITECT.

THE BUILDER, JULY 30, 1904.

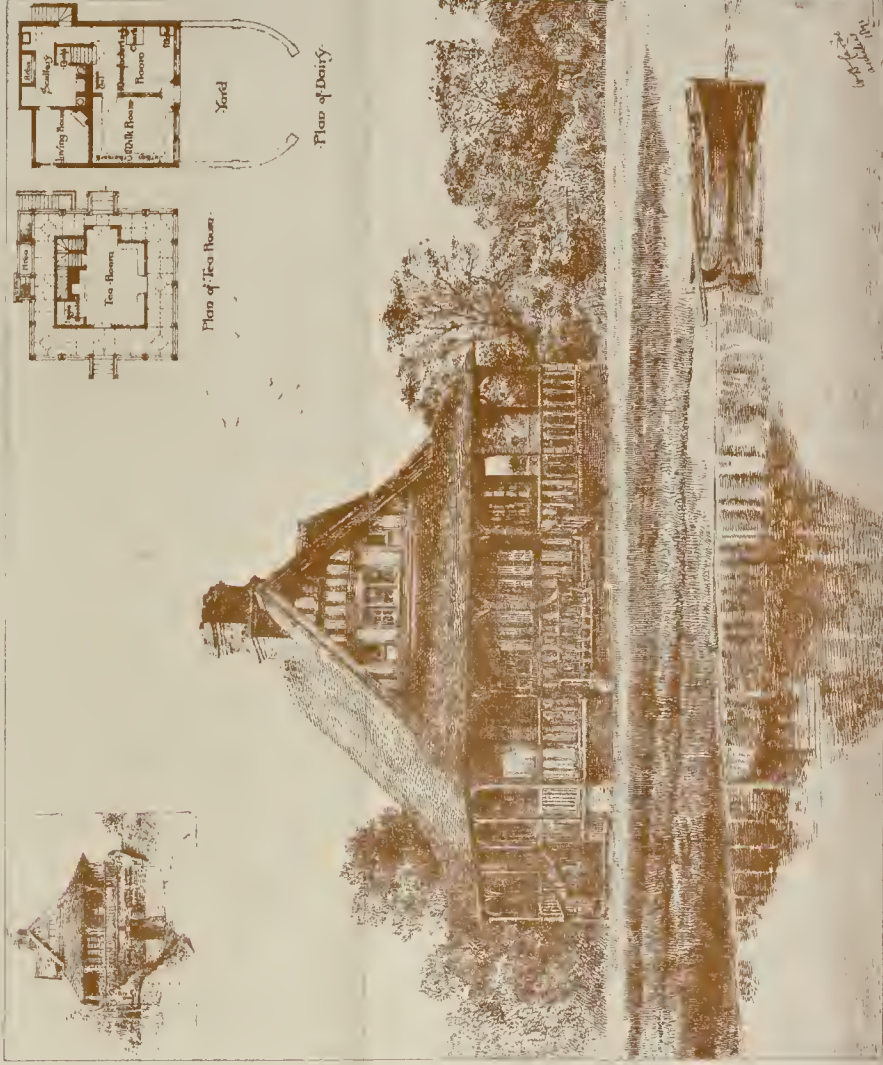


PHOTO SPRAGUE & CO. 4 & 5 EAST MADISON STREET, PETER, LANGE & CO.

BLYTHWOOD DAIRY, STANSTEAD, ESSEX.—MR. W. D. CARREL, F. R. I. B. A., ARCHITECT.

ith old-fashioned perennials and climbers on the walls; and if it is thought that the surrounding furze and woods are insufficient to give the desirable balance of warm colouring in winter a proportion of beech and hornbeam hedges would be introduced. T. H. MAWSON.

BLYTHWOOD DAIRY, STANSTEAD, ESSEX.

This dairy was erected some years ago for Sir James Blyth, Bart., at Stanstead, Essex, and was one of the first dairies equipped with electric plant.

Sir James Blyth has recently lent his farm to the Blythwood to the Government for the work of the Tuberculosis Commission, whose interim report was published a short time since.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—On the invitation of the York Architectural Society, a party from the Leeds and Yorkshire Architectural Society, including Mr. G. B. Bulmer, the President, visited York on Saturday to inspect the west front of York Minster. A scaffolding is at present erected at the Minster, and afforded an opportunity for minute inspection which may not occur again for many years. The party were shown over the work by the clerk of works, and were able closely to examine the south tower, and afterwards went over the stone yard in connexion with the work.

ENGINEERING SOCIETIES.

INSTITUTE OF SANITARY ENGINEERS.—The members of the Institute of Sanitary Engineers in the 16th inst. visited Tunbridge Wells, on the invitation of their President, Mr. W. H. Maxwell, the Borough Engineer. The Mayor greeted the members on their arrival at the Town Hall. Mr. Maxwell then accompanied the party to the various public works in the district. The water supply of the borough is derived from twelve deep-seated springs gravitating through iron collecting pipe lines to a large open storage reservoir of about 45,000,000 gallons capacity, and is supplemented, when required, by an excellent water obtained from deep artesian borings through the Wadstrey clay into the Ashdown sands. The works are situated at Pembury, about four miles to the north-east of Tunbridge Wells. The daily supply fluctuates from about 700,000 gallons to 1,000,000 gallons, according to the time of year, and the total yearly supply is about 60,000,000 gallons, equivalent to a total consumption of about 20 gallons per head per day, including that used for trade, garden, and municipal purposes. The waste in distribution is therefore reduced to an almost negligible percentage. From the works at Pembury the supply is pumped through some two miles of rising main (12 in. in diameter and provided in duplicate) into a covered service reservoir of about 1,000,000 gallons capacity, situated at Blackhurst, on the eastern outskirts of the borough. In pumping into this reservoir the engines work against a total head, including friction, of 385 ft., which is equal to a pressure of 167 lb. to the square inch on the lower end of the rising mains. The top water level of this reservoir is 500 ft. above the sea level and the lowest portion of the borough supplied about 40 ft. above the same datum, a difference of head which is capable of giving a pressure of about 113 lb. to the square inch. For the better supply of high portions of the borough not fully reached by the service reservoir a stand-pipe 40 ft. in height is provided close to the reservoir, and over which a supply is given daily. For drainage purposes the borough is divided into three watersheds, one gravitating to the northern sewage farm situated near the Southborough railway station (S.E.R.), one to the southern sewage farm near Groombridge (L.B. and S.C.R.), and one to the Hurstwood pumping station, where the sewage is pumped into the outfall sewer gravitating to the southern farm. The sewerage system of the town consists of brick and pipe sewers, varying in diameter from 6 in. up to 5 ft. diameter. At the Hurstwood pumping station are two Crossley gas engines, for the purpose of raising the sewage through about three-quarters of a mile of 9 in. rising main against a head, exclusive of friction, of 14 ft. During the year 1903 this plant pumped about 50½ million gallons in 4,150 hours, or at the rate of 12,170 gallons per hour, at a cost for gas of .88d. per 1,000 gallons

—the price of gas being 3s. per 1,000 cubic feet. The two sewage farms above named are each of about 200 acres in extent, equal to about ninety persons to the acre, and deal with the sewage and a portion of the storm-water on the broad irrigation principle. The heavier solids are first removed in precipitation tanks, and the sewage then distributed by means of "carriers" contouring the slopes of the land. The treatment consists of from three to five applications, according to circumstances, and the two farms engage some twenty-two men on the sewage treatment and farming operations. The crops grown consist principally of ryegrass, root crops, etc., and a little hops.

THE JUNIOR INSTITUTION OF ENGINEERS.—The members of this Institution, through the courtesy of Messrs. Coode, Son, and Matthews, the engineers, and Messrs. S. Pearson and Son, the contractors, were recently afforded the opportunity for inspecting under special facilities the National Harbour Works at Dover. Permission was also kindly given for the works of the Dover Harbour Board, of which Mr. A. T. Walmisley is the engineer, to be seen, and the turbine South Eastern and Chatham Railway Channel Steamer *The Queen*. On arrival at Dover the party (about one hundred in number) went aboard *The Queen* just previously to her starting for Calais, the chief interest, of course, being centred in the engine-room, containing Parsons turbines of 8,000 I.H.P., capable of propelling the vessel at 21.73 knots. From the Admiralty Pier the members were taken by a tug belonging to the Dover Harbour Board across to their Prince of Wales Pier, where the big Atlantic liners of the Hamburg-American Line now call. This pier was built by Sir John Jackson to the designs of Messrs. Coode, Son, and Matthews. The swing bridge on the connecting railway was shown in motion. After luncheon the Admiralty Harbour Works were seen, the members being conveyed along the East Arm by the contractors' railway. All the operations in the preparation of materials and in the processes of construction were explained in detail. Some of the party viewed the work from one of the Harbour Board's tugs. The total length of sheltering works is 9,520 ft., and the area enclosed will be 610 acres at low water. All the under-water work of the Admiralty Pier extension and of the East Arm is practically completed, and a commencement has been made on the island breakwater, which is to be built in a similar manner by concrete blocks, the bedding of the first course being prepared by means of grabs and the use of diving-bells.—On July 22 a visit was paid to Messrs. Bryant and May's Match Manufacturing at Bow, the processes in the making of both square stick matches and wax vestas being shown. Special interest was manifested in the continuous machines for both classes of matches, which treat the raw material and convert it into the finished product automatically throughout, filling into boxes which are then placed in the covering by operatives stationed at the machines.

COMPETITIONS.

SCHOOL, OLDHAM.—At Oldham the outgoing School Board had held a competition for a new school on the Clarksfield-road site. Not being satisfied with the result, they left the matter over to be dealt with by the new authority. The Education Committee of the Corporation have now held a fresh competition consisting of local architects only. With the aid of Mr. Edward R. Robson, F.S.A., as assessor, they have awarded the first position to Mr. Harold Cheetham, the second to Mr. Arthur Turner, and the third to Mr. Charles T. Taylor.

CHELSEA TOWN HALL EXTENSION AND PUBLIC BATHS.—On Tuesday the committees of the Chelsea Borough Council who are in charge of the matter reported having invited Mr. R. Dickenson, Messrs. Sheppard and Burkinshaw, Mr. L. Stokes, and Messrs. Wills and Anderson to furnish preliminary reports and plans for the extension of the town hall and the reconstruction of the public baths. With reference to the extension of the town hall, six schemes were received (alternative designs being submitted by Messrs. Sheppard and Burkinshaw and Messrs. Wills and Anderson), and these had been carefully considered. All the architects practically provided the accommodation required. The scheme which, subject to certain alterations, the committee were of opinion best suited the Council's

requirements, was that of Mr. Stokes, the estimated cost of which, exclusive of alterations to the town hall, cloakrooms, and gallery staircases, is 17,704. Designs for new baths were submitted by the four architects, and the committee had selected that of Messrs. Wills and Anderson as being the one best adapted for their purposes. Mr. A. G. Cross was appointed quantity surveyor in connexion with the extension of the town hall, and Mr. F. H. A. Hardeste quantity surveyor in connexion with the reconstruction at the baths. Information had been obtained as regards the latter work as to the cost of a second-class swimming-bath, Turkish bath, water supply, electric light and superintendent's house, and the quantity surveyor is to report on the prices for these extras as planned by Messrs. Wills and Anderson.

PUBLIC LIBRARY, PETERBOROUGH.—The competition for the Public Library, Peterborough, has now been decided as follows:—First premiated design, Messrs. Hall and Phillips, 6, Great James-street, Bedford-row, London, E.C.; second premiated design, Messrs. Briggs and Wolstenholme, Central-buildings, Richmond-terrace, Blackburn; third premiated design, Mr. Thomas Davison, 28, Great Ormond-street, London, W.C. Mr. Leonard Stokes of Westminster was the assessor, and his award was received and adopted by the Council.

Books.

Pocket-Book of Useful Formulae and Memoranda for Civil and Mechanical Engineers. By SIR GUILDFORD L. MOLESWORTH, K.C.I.E., President Inst.C.E., M.I.Mech.E., and HENRY BRIDGES MOLESWORTH, M.Inst.C.E. Twenty-fifth Edition. Revised and enlarged, with an Electrical Supplement, by WALTER H. MOLESWORTH. London: E. and F. N. Spon, Ltd., 125, Strand. 1904.

VERY little need be said about this book, for the simple reason that, during a period of more than forty years, it has been the constant companion and daily guide of engineers throughout the world. Although other pocket-books of somewhat similar character have appeared within recent years, "Molesworth" retains the premier position, and it is a noteworthy fact that the eminent engineer who produced the first edition is still one of the authors of the present volume. Fully recognising the obligation of keeping abreast of the times, the authors have made considerable alterations and additions in many of the subjects covered; new matter has been substituted in place of that which has become obsolete, and full recognition has been taken of the immense strides taken by electrical science. Notwithstanding the fact that the book is dedicated simply to engineers, we recommend it strongly to architects, surveyors, and builders, who will find in it much information that is applicable to their respective avocations.

How to Estimate. Being the Analysis of Builders' Prices. By JOHN T. REA, F.S.I. Second Edition. Revised and Enlarged. London: B. T. Batsford, 94, High Holborn. 1904.

THE author must be congratulated upon the well-merited success of his work, the first edition, as he states, having been sold out within a year. We gave a somewhat lengthy review of that edition at the time of its appearance, partly on account of the importance of the subject dealt with, and partly because of the very thorough way it had been treated by the author. At that time we praised his effort, but with certain qualifications. This second edition is much more than a reprint of the first, and the author must be commended for the very thorough way he has taken up the revision—no small task in a work of this size and description. This revision has been most judiciously done, and the work bears evidence that the author has conscientiously considered almost every item upon its merit. Many of the strictures we passed in our review of the first edition do not, in consequence of this, now apply. In addition to the revision, the work has also been somewhat extended, with increased usefulness, and we have little doubt that we shall be able to congratulate Mr. Rea upon a similar success with this edition as with the first. One little slip we notice on page 270. While throughout the work the author, in arriving at his prices, has revised the rate of wages (from 10d. to 10½d.),

in the example given on this page he has allowed the old rate (10d.) to stand. On the other hand we may take as an example of the drastic nature of the revision the items on concrete on pp. 89, 90, and 91.

Spons' Architects' and Builders' Price-book, with Useful Memoranda and Tables. By W. YOUNG, Architect. Thirty-first edition. Edited by CLAUDE YOUNG, A.R.I.B.A. London: E. and F. N. Spon, Ltd., 125, Strand. 1904.

We note with a certain degree of pleasure that the editor has at last seen his way to attempt some revision, both in prices and arrangement; but a good deal more requires to be done before it can take the place it did in the earlier editions—say those of twenty years ago and thereabouts. There is much in the work that might be of a useful character were it brought more up to date—a most important consideration in an annual publication. We still notice the glaring inconsistency which we pointed out in our review of the thirtieth edition, of a list of rolled steel joists with rolled iron weights. The standard list which was arranged last year is not given, but an old list which used to appear in the appendix now turns up in the "Useful Memoranda and Tables" section, and this differs from that given in the prices section in every particular. We must still insist upon the position we have previously taken—viz., that the work substantially requires re-writing, or at least complete revision item by item.

Builders' Quantities. By HERBERT C. GRUBB. London: Methuen and Co., 36, Essex-street, London, W.C. 1904.

THE author in his preface hazards the startling opinion that "The study of builders' quantities is probably the most fascinating of any undertaken by architectural and building students," an opinion that will be received with a large measure of scepticism by those who are best qualified to judge. In the case of the "architectural student," we are afraid that the fascination is not altogether unconnected with the opportunity of turning an honest penny by doing work that would more properly be left to those specially trained in this class of building practice. Be this as it may, there seems a tendency at the present time to treat the subject as a "school" one, rather than a "professional" one requiring a practical training, and in perusing this book this opinion is strengthened. In fact, the author opens his preface by candidly stating that the work "has been compiled to assist students who are preparing for examination." This is most obvious to any one who studies the work, and doubtless the student who is bent upon passing his examination will find it useful, especially as sample questions are given in the appendices. Taking the work as a whole, the author, with the view of passing examinations before him, has doubtless achieved his object. The form in which the examples of abstracting are given will be of very little use in practice. The various diagrams throughout the work are worthy of all praise, but some of the descriptions are very bald, and would be the cause of very wide tendering. This is, of course, quite a matter of detail in more senses than one, but it is a just cause for the complaint on the part of contractors as to the paucity of description in "architects'" quantities. The "building student," who is taking quantities for his own use only, and not for the use of other builders, will probably find the work useful.

Journal of the Sanitary Institute, Vol. XXIV, Part IV. London: The Sanitary Institute, Margaret-street, W. 1904.

This issue of the *Journal* consists principally of papers read at the Institute's Congress at Bradford last year. Many of these are of more or less general interest, but we must confine ourselves to those relating to building and sanitation. A short paper by Mr. M. S. Briggs on "Cottages for Agricultural Labourers" is not without value, but the "two typical sketch-plans" with which it is illustrated are far from perfect; in Plan A the living-room is too narrow, the copper and sink in the scullery are awkwardly placed, and bedroom No. 1 is L-shaped; the living-room in Plan B has five doors and the window is in the same wall as the range; the scullery is inadequately lighted, and in two of the bedrooms there is no space for furniture except the beds. Mr. J. G. D. Armstrong, in a paper on "Cement Joints in Drains," points out the causes of failure in the joints of stoneware pipes,

and advocates the use of neat cement, thoroughly air-slaked, and finely ground; the paper elicited an interesting discussion. A large part of the volume is occupied by papers on various details of school hygiene, of which the most important to the architect is that by Mr. D. M. Nesbit on the "Warming and Ventilating of Public Schools." Mechanical ventilation is advocated, and plans and sections of two schools at Bradford, ventilated in this manner, are given. The report of the discussion on "Practical Considerations in Connexion with Modern Methods of Treating Sewage" is decidedly interesting, and shows a marked preponderance of opinion in favour of percolating filters and against contact-heds.

Stresses and Thrusts: A Text-Book for Students.

By G. A. T. MIDDLETON, A.R.I.B.A., Third Edition, Revised and Enlarged. Illustrated with 170 diagrams. London: B. T. Batsford. 1904.

IN the present edition of this work several alterations have been made, which ought to increase its popularity among architectural students. The chapters upon "Rectangular Beams" and "Arches" have been remodelled, and worked examples have been added to the chapters dealing with struts, and the design of steel joists and steel plate girders, these alterations and additions clearly adding to the utility of the work. The inclusion of some selected R.I.B.A. examination papers is a useful feature of this excellent text-book in its latest form.

A Digest of the Law Relating to the Easement of Light. By E. S. ROSCOE, Barrister-at-Law, Admiralty Register of the Supreme Court. Fourth edition, revised and enlarged. London: Stevens and Sons, and Reeves and Turner. 1904.

A FURTHER edition of this practical little hand-book on the law relating to light is especially welcome at a time when the attention both of lawyers and the public has been drawn to the subject by the recent decision of the House of Lords. The author has added to this edition an historical introduction, which was originally published in these columns, in which he traces the origin of our present law back to the principles of the Roman law. The decision of the House of Lords is considered and explained in this edition with great clearness, but we could wish a little more had been said of the influence it will have on prohibitive injunctions. In Art. 39, which deals with this question, the reference to the above case, *Colls v. Home and Colonial Stores*, is to the decision in the Court of Appeal, but in the House of Lords some important dicta on this point were enunciated. The effect of their decision being that there is no proprietary right to all the light, but that the obstruction to the light must amount to a nuisance, there is some difficulty in obtaining an injunction to abate a nuisance not at the time committed, as the question of degree comes in, and Lord Macnaghten especially dealt with this question. Those who have read former editions of this digest will need no advice from us to possess themselves of this later edition, whilst to those who require an exposition on a difficult point of law in a most clear and readable form, this manual can be confidently recommended.

Correspondence.

LIGHT AND WATER.

SIR,—I am encouraged by your kind appreciation of "Light and Water" in your last issue, to write a few words of explanation of my note on the "Reflection of a Rainbow," which I regret I did not make sufficiently clear. In that note I said that "the reflexion consists of a smaller area than the actual rainbow, its extremities springing not from the ends of the rainbow proper, but from points inside them." Let us assume, for the sake of argument, that the drops of water forming the bow are stationary. The rays of light from these drops all converge to one point, namely, the eye of the observer. The rainbow thus differs from a real object in that (taking only the primary bow into account) any point in it sends out a ray in one direction only, instead of rays in all directions. It is, therefore, manifestly impossible for the rays from this particular how to

reach the spectator's eye by reflexion from the surface of the water. If he shifts his position, he will see a how formed by other drops—another how, in fact, and not the one that appeared to him in his first position. Now, the only bow that can appear to him by reflexion from the water is the bow that he would see were he lowered to a point as far below the surface as he is actually above it. Hence the break of which I have spoken between the actual and the reflected how (which must exist unless the sun happens to be on the horizon).

But, as I said in the note, if the spectator were standing close to the level of the water, this break would be hardly perceptible. One would not, therefore, venture to maintain that Turner had incorrectly represented a reflected rainbow in his water-colour drawing of Arundel Castle in the National Gallery. I do not myself profess to be an expert in optical science, and therefore before printing I obtained the opinion of one of our first mathematicians, a distinguished member of the Royal Society, who said that my reasoning was quite correct. So much for theory. Coming to fact, since my book appeared, I have been told by a friend—a lawyer by profession, but a man of no little scientific knowledge—that on September 19, 1901, walking on the esplanade at Bray in Ireland, about two hours before sunset, he distinctly observed such a bow and its reflexion in the sea, the reflexion appearing as a smaller arc starting from points inside the ends of the actual bow. It was nearly low water at the time, but even then the esplanade is not much more than 20 ft. above sea-level.

M. F. MONTAGU POLLOCK.

SIR,—I have read with much interest your article upon "Light and Water," the subject of reflections and colouring in water having been always a very attractive one to me.

With regard to the question of the reflection of a rainbow, there is a picture—I do not know in whose possession, but I have an etching of it in my house—by the late Mr. Keeley Halswelle, of Killyburn Castle, in which the clouds, in varied colours, are reflected in the calm water of Loch Awe; a fragment of rainbow is represented towards the right of the picture, apparently resting—if one may use the term in this connexion—on the surface, and reflected, though only for a very short distance, at the reverse angle; the break between the rainbow and the reflection is, however, not distinguishable. I mention this as an instance in which the artist has apparently seen some such effect. I have never seen it myself, but I certainly agree with the writer of the article that a rainbow showing against a dark cloud would be reflected. I should very much like to see this tested, and I shall be on the look out for an opportunity.

I have frequently studied the reflections of ships in partially ruffled water, and have noticed some curious effects, which are not always truthfully represented by marine artists. For instance, in the case of a vessel in ruffled water, at a distance of a quarter of a mile or so, there is no reflection of the hull, the more or less broken reflections of the masts and funnels springing from the water-line. The same thing is noticeable in the case of a lighthouse on a low rock.

Another curious point is the colour of a partial reflection of, say, the shaft of a lighthouse. The column may be, and usually is, white, or perhaps particoloured, like the Eddystone, but under certain conditions the reflection, springing, as above described, from the water-line, does not represent the colouring of the lighthouse, but simply a well-defined outline of it, of a deeper shade of green or blue than the water. I have noticed the same thing when seagulls, their plumage dazzling white in the sun, swoop near the ruffled surface. The widening path of light under the moon as the sea gets rougher is familiar enough to seamen, who see it in all its gradations, from a broad, heaving track to no track at all, but simply a shimmering reproduction of the moon, at a corresponding apparent distance beneath the surface. This latter is not very common, requiring of course a glassy sea, free from swell, and the effect has apparently little charm for artists.

The most perfect reflection I have ever seen was in Loch Achrae, in Scotland; a photographer was on the spot, and invited me to look into

camera and say whether or not it was an eriting lens. I could not tell!

E. P. STATHAM
(Commander, Royal Navy).

PROVISIONAL SUMS IN CONTRACTS.
Q.—May I be allowed to submit the following question to your readers?—
A manufacturer A instructs an architect B to prepare plans and specifications for alterations in his premises, and the work entrusted to firm C; if, in the specification, provisional lump sums are allowed, say 100£. lighting, 200£. drainage, etc., on C renders his account, is it usual for A to give details for the provisional sums or B certifies, and is it usual for B to pass the account in detail for settlement?
INQUIRER.

The Student's Column.

NOTES ON PORTLAND CEMENT.

PART III.—CHEMICAL ANALYSIS OF CEMENT AND INTERPRETATION OF RESULTS.

THE chemical analysis alone of a pure cement is no criterion of its value, but, in conjunction with the physical tests, it gives very necessary information. Moreover, although the presence of adulterants may be detected by a microscopical examination, their presence requires to be proved and their amount estimated by chemical analysis. In the first part of this chapter is given a method for the exact analysis of cement, in quick technical methods.

Loss at a Red Heat.—Ignite 2 grammes of the finely pulverised cement in a platinum crucible of constant weight. The loss is combined water, carbonic acid, and organic matter. The carbonic acid may be estimated in another portion of the sample by Mohr's apparatus if in quantity, but more exactly by the direct method absorbing the gas, liberated by the action of hydrochloric acid, in soda lime.

The combined water is obtained by heating a sample in a hard glass tube through which a current of dry air is passed, and absorbing the water expelled in pure dry calcium chloride.

Silica, Alumina, Oxide of Iron, Magnesia, and Alkalies.—To 1 gramme of the finely pulverised cement in a porcelain basin add about 20 ccs. water, and stir to prevent setting; then add 10 ccs. hydrochloric acid. Evaporate to dryness, take up the residue with a few drops of dilute hydrochloric acid, and again evaporate to dryness. Heat in the air oven at 110° C. for 2 hours to render the silica insoluble, dissolve a few ccs. hydrochloric acid, add water, and dilute. Filter and wash thoroughly with hot water till free from chlorine, using care not to stir up the precipitate, dry and ignite in a platinum crucible till perfectly white, care being taken to prevent any of the silica, which is very light, being carried out of the crucible.

The result gives the silica and insoluble residue. The insoluble residue is estimated in another portion of the sample, as explained hereafter. To the filtrate, which is brought to the boil, add ammonium chloride and ammonia in very light excess, and again boil till the smell of ammonia is no longer perceptible. Filter the precipitate, which consists of alumina, iron oxide, and a little lime, wash several times with hot water, pierce a hole in the filter paper, and wash the precipitate into the beaker in which it was precipitated. Dissolve in hydrochloric acid, and repeat the precipitation. This time the alumina and iron should be free from lime. Filter the precipitated oxides, wash thoroughly with hot water till free from chlorine, transfer while yet wet to a platinum crucible, and ignite, along with the filter paper used in the first filtration, for ten minutes after the papers are ashed. The result gives Al_2O_3 and Fe_2O_3 as the weighed oxides in the platinum crucible with acid sulphate of potash, dissolve in sulphuric acid and titrate the iron with standard permanganate of potassium. Mix the two filtrates from the iron and alumina, which should be about 300 ccs. in bulk, add a few drops of hydrochloric acid, boil, and carefully add crystalline oxalic acid, then slight excess of ammonia. If allowed to stand overnight, in a warm place if possible, no magnesia will be along with the oxalate of lime, which is filtered, and wash thoroughly with hot water till free from chlorine. The reason for using oxalic acid instead of oxalate of ammonium is that no carbonate of lime is formed, as is the case if the latter be used. It is very important

to see that excess of ammonia is present before filtration of the oxalate of lime as ammonium chloride and oxalic acid react with formation of hydrochloric acid. Partially dry the oxalate of lime in an air oven, ignite in a platinum crucible over a blow-lamp till the weight is constant, and weigh as CaO. To the filtrate from the oxalate of lime add a few ccs. hydrochloric acid, and boil down to about 250 ccs. bulk. After cooling, add 250 ccs. of 10 per cent. ammonia and phosphate of ammonia. Stir well till the phosphate of ammonia begins to separate, allow to stand twelve hours, filter, and wash with cold water to which 20 per cent. of ammonia has been added. Dry the precipitate in an air oven, and, if in small quantity, ignite along with the filter paper in a porcelain crucible. Should the quantity of magnesia be large, separate as far as possible from the filter, burn the paper in a platinum wire loop, adding the ash to the precipitate in the crucible. Ignite till no black points are seen, adding a drop of nitric acid if necessary. Weigh the $Mg_2P_2O_7$, and calculate to MgO.

The alkalies are usually obtained by difference, but in a well-burned cement there should not be much.

Sulphuric Anhydride and Insoluble Residue.—To 2 grammes of the sample add 250 ccs. of water and 20 ccs. hydrochloric acid, and boil for about five minutes. Filter, and wash till free from chlorine, transfer filter and residue to a nickel basin, and boil with 20 per cent. soda carbonate solution. Filter while hot, wash first with hot soda carbonate solution and then with distilled water till silver nitrate gives no milkiness with some of the washings. Ignite the residue and paper while yet wet in a platinum crucible. This result is the insoluble residue, which should be deducted from the first result for silica.

Precipitate the sulphuric acid in the first filtrate from the insoluble residue with barium chloride. Allow to stand about twelve hours, and filter through a good filter-paper or moisten the paper with a few drops of ammonium acetate, which prevents the barium sulphate going through. If the quantity of barium sulphate is small, wash with cold water, otherwise use hot water. Wash till free from chlorine, ignite in a porcelain crucible till the paper is ashed, add three drops hydrochloric acid and one of sulphuric acid, heat carefully till dry, and ignite five minutes longer. Calculate to sulphate of lime, deducting the lime necessary from the total lime.

Technical Analysis.—It is very necessary for the manufacturer to make a partial analysis of his product from time to time, and for this, quick methods are required. The insoluble residue, sulphuric anhydride, and lime are the chief ingredients required to be known.

Insoluble Residue and Lime.—Dissolve 1 gramme of the finely pulverised cement in water and dilute hydrochloric acid. Filter the insoluble portion, and treat with soda carbonate solution as before explained. This will give the insoluble residue. To the boiling filtrate add ammonia in very slight excess. The silica, alumina, and iron are precipitated along with a little lime. The precipitate is filtered, redissolved in hot hydrochloric acid, again precipitated with ammonia, and filtered. All the lime should be in the filtrates, which, when mixed, should be about 300 ccs. in bulk. Precipitate the lime with ammonia and oxalic acid as before explained. The error should not exceed 0.1 per cent.

Lime.—If lime only is required, precipitate twice with ammonia from the hydrochloric acid solution and estimate the lime in the two filtrates.

Sulphuric Anhydride.—If only sulphuric anhydride is required, dissolve 2 grammes of the cement in dilute hydrochloric acid and boil for about five minutes. Filter off the insoluble residue, and make the filtrate up to about 300 ccs. in bulk. Precipitate the sulphuric acid as before explained. If the boiling is not too long continued, nor the liquid too concentrated, there is no danger of silica coming down with the sulphate of barium.

Interpretation of Results of Analysis.—No fixed figure can be given for the quantity of each compound which should be present in a good cement, but there are certain ingredients always present which should not be excessive, such as magnesia and sulphuric anhydride. The definition of Portland cement as given by the Association of German Cement Makers is generally accepted as nearest the correct one.

It is as follows:—"Portland cement is a product manufactured by burning to clinkering state a good mixture of lime and clay materials as chief constituent parts and grinding the resulting clinker to meal fineness."

As all Portland cements are made from the same materials—lime and clay—it is natural that the difference between their chemical compositions cannot be very great. The composition of French and other Portland cements is given by E. Candlot ("Étude Pratique sur le Ciment de Portland," Paris, 1886), and is as follows:—

Lime	from 58.00 to 67.0	per cent.
Silica	" 20.0 " 25.0	" "
Oxide of iron	" 2.0 " 6.0	" "
Alumina	" 5.0 " 10.0	" "
Magnesia	" 0.5 " 3.0	" "
Sulphuric anhydride	" 0.5 " 2.0	" "

The German Portland Cement Association gives the following values for German cements:—

Lime	from 58.22 to 65.50	per cent.
Silica	" 19.80 " 23.45	" "
Oxide of iron	" 2.19 " 4.47	" "
Alumina	" 4.16 " 9.45	" "
Magnesia	" trace " 2.89	" "
Alkalies	" 0.19 " 2.83	" "
Sulphuric anhydride	" 0.13 " 2.19	" "
Loss on heating	" 0.26 " 2.67	" "
Insoluble residue	" 0.12 " 1.38	" "

The values given by Dr. Karl Schosch are:—

Lime	from 57.0 to 66.0	per cent.
Silica	" 19.0 " 26.0	" "
Oxide of iron	" 2.0 " 4.0	" "
Alumina	" 4.0 " 9.0	" "
Magnesia	" trace " 5.0	" "
Sulphuric anhydride	" trace " 2.0	" "
Alkalies	" trace " 3.0	" "

The following values, deduced from numerous analyses by the author, are for English and American cements:—

<i>English.</i>		
Lime	from 58.0 to 64.5	per cent.
Silica	" 19.0 " 25.0	" "
Oxide of iron	" 1.5 " 5.5	" "
Alumina	" 5.0 " 11.0	" "
Magnesia	" trace " 2.0	" "
Sulphuric anhydride	" trace " 2.75	" "
Insoluble residue	" 0.4 " 2.75	" "

<i>American.</i>		
Lime	from 59.0 to 65.5	per cent.
Silica	" 19.5 " 25.0	" "
Oxide of iron	" 2.0 " 5.5	" "
Alumina	" 6.0 " 10.0	" "
Magnesia	" 0.5 " 5.0	" "
Sulphuric anhydride	" 0.5 " 3.25	" "

When these tables are compared it will be seen that they are very near one another, and, if the values are far from these, the cement is sure to be a poor one or adulterated.

Magnesia.—Chemists differ very considerably in their opinion as to the action of magnesia. Dr. Newberry says, "Magnesia, though possessing marked hydraulic properties when ignited alone, yields no hydraulic products when heated with silica, alumina, or clay, and probably plays no part in the formation of the cement. It is incapable of replacing lime in cement mixtures, the composition of which should be calculated on the basis of the lime only without regard to the magnesia present."

Dykerhoff's report to the German Association of Cement Manufacturers on this subject went to prove that over 4 per cent. of magnesia resulted in a weakening of the cement. He showed that magnesia caused expansion, and took a longer time to develop disintegration than does loosely combined lime. Le Chatelier mixed 5 per cent. of magnesia with a good cement and placed a pat in cold water; swelling did not take place till after six months. Another pat he hoiled; expansion began after six hours and ended in forty hours. It is difficult to state absolutely what effect magnesia has on a cement. From experiments it is evident that it should not be present in greater quantity than about 3 per cent., though it greatly depends on the grinding and burning whether even this amount is permissible.

Sulphate of Lime.—This is one of the most dangerous compounds that can exist in Portland cement when in quantity. For most purposes a cement containing over 2 per cent. sulphuric anhydride is dangerous (59 per cent. SO_3 represents 1 per cent. $CaSO_4$). Candlot found that aluminates of lime and sulphate of lime produced a body of the formula $Al_2O_3 \cdot 3 CaO \cdot 2 CaSO_4 \cdot 6 H_2O$, which causes expansion. Michaelis has described a similar body which he called the "cement bacillus," to which he gave the formula $Al_2O_3 \cdot 3 CaO \cdot 3 CaSO_4 \cdot 30 H_2O$. This body occupies a much larger space than the aluminate and sulphate which enter into its composition, and hence when formed in quantity causes expansion. Le Chatelier, Schott, and Klinkenberg have confirmed these statements that sulphate of

lime forms expansive compounds with aluminates of lime. The former two experiments have shown that sulphate of lime has no effect on cements specially prepared containing no iron or alumina. Schott found the same effect of sulphate of lime on calcium ferrite as on aluminates of lime.

Fresenius established the following limits for pure Portland cement:—

- (1) The specific gravity not less than 3.1.
- (2) The alkaline strength such that a water solution containing 0.5 grm. of cement neutralises 4 to 6.25 ccs. $\frac{1}{10}$ N hydrochloric acid.
- (3) An action of permanganate of potassium solution (1.589 gms. per litre) so that 1 gramme of cement reduces from 0.79 to 2.8 mgs. of permanganate, and in any case very little more than this. [Since Fresenius established these limits, rotary kiln cement has come much into vogue, and this product, being burned in the reducing flame, decomposes much permanganate, so this test can only be employed as a preliminary one.]

(4) Specific gravity test. Using a mixture of turpentine and methyl iodide (spec. grav. 3.01) the light parts which swim can be:—

(1) Coal or coke dust of average specific gravity	1.39
(2) Gypsum	2.33
(3) Coal slack	2.73
(4) Furnace slag	2.94

With suitable fluids these different parts can be separated. The parts which sink in solution of 3.01 specific gravity can be:—

- (1) Cement of specific gravity . . 3.035
- (2) Iron and certain iron compounds.

A NEW FIRE-RESISTING BRICK.

THE Hempstead patent brick, made at the works of the Hempstead Patent Brick Company, near Hemel Hempstead, Herts, consists of local clay so treated in the course of manufacture that the specific gravity of the product is barely three-fifths that of ordinary brick, and its consistency is such that it can be cut to any shape or size by an ordinary saw, and is easily penetrable by soft iron nails or by ordinary wood screws. It follows naturally that the mechanical strength of the material cannot be so high as that of good brick as ordinarily made, but that is a matter of secondary importance, as partitions—for the construction of which it is specially recommended—are never intended to withstand high compressive or other stress. The clay used for the purpose of manufacture contains a sufficient proportion of silica to ensure high resistance to heat, and the other features mentioned above are due to the admixture of hardwood sawdust with the clay before it is passed through the pug-mill. After having been moulded into the required form and dried, the mixture is transferred to the kilns where the sawdust is entirely consumed during the process of burning, thus leaving voids uniformly dispersed throughout the finished product.

The Hempstead bricks are made in two forms:—(1) of standard dimensions, which can be built into walls so that door-frames and other fittings can be nailed to them; and (2) of different dimensions, such as 12 in. by 9 in., and 12 in. by 6 in., and of thicknesses varying from 2 in. to $\frac{1}{2}$ in. As a general rule the bricks are made hollow, for the purposes of reducing weight and of affording resistance to the conduction of sound. The bricks intended for the construction of partitions are moulded in a machine which forms grooves with jagged edges on the outer faces, so as to afford a good key for the mortar; but, as a matter of fact, the entire surface is sufficiently rough and porous to furnish an excellent tooth even without the grooves.

Some tests, which we witnessed last week, were conducted in two brick-built kilns on the works of the Company at Hemel Hempstead. Two partitions were built in each kiln, so as to form a narrow space communicating directly with two furnaces, one at each end, and fed through doors outside the building. The whole space, divided for the height of about 3 ft. from the bottom by a brick wall, virtually formed a flue for the flames, which passed through two vertical flues into the open air. In kiln No. 1 the front partition was $\frac{1}{2}$ in. thick, and the back partition 3 in. thick, and in kiln No. 2 the front and back partitions were $\frac{1}{2}$ in. and 2 in. thick respectively.

The fires were lighted early in the morning, and were kept up until after 6 p.m. in the evening, although two of them were drawn about 5.30 p.m. for the purpose of a water test on the inside and outside surfaces of the partitions. Constant readings of the temperatures were taken, under the direction

of Mr. H. Brandon-White, M.I.E.E., from four electrical pyrometers, of the type invented by the late Sir W. C. Roberts-Austen. The recording apparatus of these instruments was placed in a small shed between the two kilns, the readings being taken at intervals of five minutes throughout the day. At 11.50 a.m. the maximum temperatures attained were 1,755 deg. F. in kiln No. 1, and 1,695 deg. F. in kiln No. 2, and as notwithstanding the evident increase of temperature, this record was very little surpassed at 3 p.m., the suggestion was made that the position of the pyrometers did not permit the maximum temperature to be recorded. This idea was confirmed by the fact that a piece of cast iron placed at the back of one furnace had evidently melted. Accordingly, the pyrometer tubes were inserted through two fresh holes situated more directly in the course of the flames, with the result that the temperatures recorded became 2,100 deg. F. in kiln No. 1, and 1,800 deg. F. in kiln No. 2.

In spite of the great heat maintained, none of the partitions suffered the slightest damage, with the exception of two or three unimportant surface cracks, and, on the application of cold water, the only perceptible effect was to cause a slight contraction of the cracks mentioned. The tests here described were quite sufficient to convince us of the valuable fire-resisting properties possessed by the new material, which, we are informed, has already been adopted by the London County Council and in connexion with the new Gaiety Restaurant.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Managers was held on Saturday last week, at the offices, Victoria Embankment, E.C., Mr. Scovell presiding.

Among the correspondence received was a letter from the Local Government Board, assenting to the carrying out of certain works in connexion with the laundry at Leazesden Asylum, and promising to issue an order authorising the expenditure of a sum not exceeding 1,800*l.* on the scheme.

On the recommendation of the Finance Committee it was agreed to apply to the Local Government Board for authorising the expenditure of a sum not exceeding 595*l.* on the provision of additional male staff and store accommodation at the Western Hospital; and for an order authorising an expenditure of not more than 1,825*l.* on the conversion of certain ordinary blocks at Leazesden and Caterham Asylums into infirmary blocks.

The Works Committee reported that, with the concurrence of the Hospitals Committee, they had approved of certain recommendations (which arose out of a report by the architects, Messrs. T. W. Aldwinckle and Son) which had been submitted to them by a special sub-committee, and endorsed by the Engineer-in-Chief, for providing better means of access to, and at the same time improving the ventilation of, the subways at the Brook Hospital. It was proposed to do away with the stairs which at present give access from the ground floors of the assistant nurses', night nurses', and female attendants' houses, and men's quarters to the subways below the corridors outside the buildings, and to fix ladders in the area wells outside, the present windows in the subways at the foot of the stairs to be converted into open doorways; and to provide five additional entrances to the subways.

It was agreed, on the recommendation of the Committee, to have plans prepared and to forward them to the Local Government Board for their sanction.

On the recommendation of the same Committee it was agreed to carry out internal painting works in the administrative block of Joyce Green Hospital, the estimated cost of which was 350*l.* The works will be carried out by temporary labour.

The Committee recommended, and it was agreed, that the sketch plans, prepared by the Engineer-in-Chief, for the provision of two additional infirmary blocks, additional staff quarters, and hall, with covered way to the same, at the Tooting Bec Asylum, be approved and adopted, and forwarded to the Local Government Board for their sanction. The cost of the works is estimated to be 33,600*l.*

A revised scale of wages for artisans and others employed by the Managers at their asylums, was submitted by the Asylums Committee, and approved of by the Board.

CHURCH, NEWINGTON.—The fine old parish church of St. Mary, Newington, Kent, is about to be restored under the direction of Mr. G. H. Godsell of the firm of James Brooks, Son, and Godsell, of London. Mr. William Parmenter, of Braintree, is the contractor.

GENERAL BUILDING NEWS.

JOHNSON MEMORIAL CHURCH, BICKERSHAW.—This church is being erected by the trustees in memory of the late Mr. James Henry Johnson, J.P., of Abram Collieries and Hall Garth, Lancashire. The church is being erected on a site in Bickershaw-lane, adjoining the schools belonging to the Abram Collieries, and provides seating accommodation for over 200 people. Externally the building is faced with red Rainhill stone, and the window tracery of red Rainhill stone, and the roofs with red tiles, with red ridges. Vestries are provided on the north side, with separate entrance for use of clergy and choir, and are separated from the chancel by an ornamental screen. A small organ chamber is also provided on the south side, and heating chamber, &c., under vestries. The heating will be hot water and coils on the low-pressure system, and the electric light will be used for the lighting throughout. The main entrance porch is placed at the north-west corner of the building, and another entrance is also provided at the south-west corner. The new church is being carried out from the designs of Messrs. E. Knill, Freeman and Son, architects, Bolton, under the supervision of Mr. Frank Freeman, Messrs. Moore Brothers, of Rawtenstall, being the contractors, with Mr. Henry Molyneux, of Abram Collieries, acting as clerk of works.

TOWER, WORSTHORNE CHURCH, BURNLEY.—A new tower, which has been added to St. John the Baptist, Worsthorne, near Burnley, by Sir John Thursby, as a memorial to his father, was dedicated on the 11th inst., by the Bishop of Manchester. The tower, which is from designs by Messrs. Austin and Paley, of Lancaster, is 61 ft. in height and 20 ft. square at the base. In addition to the erection of the tower, the old vestries at the west end of the church have been removed, and the east in the nave continued up to the west wall. The edifice has also been renovated and re-coloured, and a new scheme of lighting carried out.

RE-OPENING OF WINTERTON CHURCH.—The Church of All Saints, Winterton, was reopened on the 14th inst. The restoration has been completed from the plans of Mr. C. Hodgson Fowler, of Durham, the contract for the work being secured by Mr. S. F. Halliday, of Stamford. The cost is put down at about 2,800*l.* An embattled parapet and pinnacles have been added to the tower. The nave and chancel have been re-roofed, the nave being raised to its original height, with clerestory windows. In the interior the roofs are of oak panelling, with carved bosses. A thick coat of plaster has been removed from the walls, so that the stonework of the window, arches, and jambs can now be seen. A new altar and vestments have been provided, and a brass altar cross, studded with crystals, has been given. Some interesting discoveries were made during the restoration. It was found that a tower had been built up against the west end of a still earlier nave, which had been plastered and whitewashed outside, as Saxon churches often were. A recess was found in the east wall of the north transept, which, it is conjectured, may have been intended to hold pictures of sculptures for the recesses of the chancel altars. Similar recesses exist at Wath, near Ripon, and Northallerton.—*Sheffield Telegraph.*

ALL SAINTS CHURCH, FISHPONDS, BRISTOL.—On the 12th inst. the Bishop of Bristol laid the foundation-stone of All Saints' Church, Fishponds, which is to be erected on a plot of land at Grove-road. The eastern portion, now about to be carried out, comprises a chancel 36 ft. long, 24 ft. wide, and 34 ft. high to crown of arched ceiling, separated on the south side by a morning chapel 23½ ft. long, 18 ft. wide, and 21 ft. high, by a couple of arches supported by clustered pillars, and from the nave by an archway supported each side by clustered columns, and on the north side by a doorway to choir vestry, with organ chamber above, and a clergy vestry on its east side, the heating chamber being below the former, and approached by a flight of steps from the outside of the church. One bay of the nave and aisles is also to be erected. The walls are to be in level courses of rock-faced plaster, the roofs being wren-boarded outside upon arched ribs with mixed red and brown Broseley tiles. The floors will be wood blocks below seats and stalls, those of the gangways being of oak with glazed encaustic tile bordering. The work to be carried out has been designed by Messrs. Linzen Barker and Son, of Bristol.

WESLEYAN CHURCH, NORBERTY.—The foundation-stones of a new chapel were laid at Norberty recently. The building will be situated in London-road, and will have a frontage of 100 ft. to the main road. Built in red brick, with white

tone dressings, it will have a fleche about 00 ft. high. The work is being carried out by Mr. Charles Brightman, builder and contractor of Watford, Herts, the architects being Messrs. Gordon and Gunton.

WESLEYAN CHURCH, LISCARD.—The Manor and Wesleyan Church, Liscard, was opened on the 12th inst. Mr. James Merritt, of Birkenhead, was the contractor, and the architects were Messrs. Grayson and Ould, of Liverpool.

PRESBYTERIAN CHURCH, TYNE DOCK.—The foundation-stone of a new church hall, to accommodate the congregation of St. Andrew's Presbyterian Church, Tyne Dock, was laid in the 20th inst. on a site in Bath-road, South Shields. The church hall, which will accommodate between 400 and 500 persons, is being erected by Mr. James Young, contractor, from plans prepared by Mr. Fred Rennoldson, architect, South Shields.

CHAPEL, HUDDERSFIELD.—The members of the United Methodist Free Church in the Rashcliffe district of Huddersfield are replacing the iron structure which has served as a chapel with a building of stone. The chapel is being built from plans prepared under the direction of Mr. S. Stocks, and it will cost about 1,200l.

SUNDAY SCHOOL, STONEHOUSE BIBLE CHRISTIANS.—On the 20th inst. the memorial-stones were laid of new Sunday-school buildings for the Stonehouse Bible Christian Church. The tender for the schools, which are to accommodate about 500 children, amounts to 2,253l. The building will face Quarry-road, and is being carried out in limestone and Portland stone, with brick dressings. It is of two stories, and comprises five classrooms and several vestries on the ground floor, and a main schoolroom on the first floor. The architect is Mr. H. J. Snell, of Plymouth, and the builder Mr. Ambrose Andrews. In connection with this work there is to be carried out, at a further cost of about 350l., a scheme for adding to the chapel itself an organ loft, with accommodation for the choir.

SUNDAY SCHOOLS, HEATON BAPTIST CHURCH.—On the 20th inst. the foundation-stones of new Baptist Sunday schools were laid on the vacant corner site adjoining the main building. The principal room will be 60 ft. by 2 ft., and there will be galleries on three sides. Mr. F. Tattersall, architect, Newcastle, prepared the designs, and the contractors are Messrs. J. and G. Douglass, also of Newcastle.

SCHOOL, LIVERPOOL.—A new school is being erected in Tiber-street, Liverpool, for the Education Committee. The school, which is capable of accommodating 1,170 scholars, is in the Renaissance style, and has been erected from plans by Mr. T. Mellard Reade. The walls are faced with St. Helena bricks, with rough terra-cotta dressings. The infants and mixed juniors are accommodated on the ground floor and the mixed seniors on the floor above. For the infants there is a classroom capable of holding 130 children, and this is divisible by glass sliding partitions. There is also a classroom for sixty children, and two others for sixty-six each. The mixed juniors' schoolroom provides accommodation for 100 scholars, and can be divided by glass sliding partitions into four classrooms, two of which will each accommodate fifty-four children and two sixty each, separate exits for boys and girls, leading to their respective playgrounds, are attached to all the classrooms, while the necessary cloakroom and lavatory accommodation is provided in convenient positions adjacent to the entrances. The central portion of the mixed seniors' department contains a schoolroom, divisible by glass sliding partitions, for 100 children, and two classrooms, each capable of holding sixty children. These rooms can be thrown together so as to form one large hall 61 ft. long by 52 ft. across. There are also four other classrooms, designed to accommodate respectively forty-eight, seventy-two, fifty-four, and sixty-six scholars, the variation in size being arranged for the purpose of giving facilities to the working of the school. In addition there are four teachers' rooms, and the usual cloakrooms and lavatories. A gymnasium has been erected on the Tagus-street side. It is 47 ft. long by 29 ft. wide, and contains dressing-rooms, shower baths, etc. The building is lighted by electricity.

HIPPODROME, LOWESTOFT.—A hippodrome building has been built on the Battery Green-road, Lowestoft, the architect of the new building being Mr. R. Scott-Cockerill. The contractors were Messrs. J. Youngs and Son, of Norwich, whose manager (Mr. Andrews) directed the operations. The front is built of red brick, with cement rendering and terra-cotta panels. It is flanked by two towers, at the base of each of which there is a symbolic figure representing the Spirit of the Hippodrome, two dromes, two horses drawing a chariot, in which is seated a female figure. Seating accommodation is provided for 800 persons.

The tradesmen responsible for the work inside the building are:—Messrs. Crotch, of Norwich, plastering; G. N. C. Mann and Co., Lowestoft, electric lighting; C. Payne and Co., Norwich, gas and heating; E. B. Whalley, Lowestoft, and Dean, Birmingham, upholstery; and Bull, of London, scenery.

MUNICIPAL SCHOOL, SEEDLEY.—On the 14th inst. the Mayor of Salford (Alderman W. Stephens) laid, in Liverpool-street, Seedley, the foundation-stone of the sixteenth school building erected directly from the rates. The area of the site is 9,633 sq. yds. The school will provide accommodation on three floors for 420 boys, 370 girls, and 360 infants, or a total of 1,170 places. There will be a special room for cookery instruction. The estimated cost of the building is 15,510l., and of the furniture about 1,080l. The architect of the school is Mr. Henry Lord, and Messrs. W. Southern and Sons are the builders.

BAPTIST CHURCH, BRADFORD.—The new Baptist Chapel, which has been erected at the corner of Horton Grange-road and Legramslane, Bradford, was opened and dedicated on the 13th inst. The building has been designed by Mr. Abram Sharp, and provides accommodation for 550 worshippers, and there is a schoolroom connected with it which is adapted for 500 children. The building will cost nearly 10,000l.

HOTEL, HUNSTANTON.—A new hotel has been built on the site of the ancient hostelry known as the "Strange Arms." The buildings have been erected from the designs of Mr. Herbert J. Green, of Norwich and Lynn, the contractor being Mr. J. Cracknell, of Peterborough.

FREE LIBRARY, CALNE.—Lord Kerry recently laid the foundation-stone of the public library at Calne. The building was designed by Messrs. Smith and Marshall, architects, and will face the New-road.

BELFAST DOGS' AND CATS' HOME.—A dogs' and cats' home has been erected, in Belfast, in Tate's avenue. It is constructed of corrugated iron, and contains twelve separate boxes for dogs and cats. The building was erected by Messrs. Boulton and Paul, Norwich, under the supervision of the architect, Mr. Vincent Craig. The concrete foundations were supplied by Messrs. McDowell, Leatham, and Frazer.

VICTORIA STATION.—In connexion with the work now in progress for enlarging Victoria Station, the London, Brighton, and South Coast Railway intend to construct over the booking-office block an annex to the Grosvenor Hotel in the Renaissance style, the material used in the main front being Portland stone, relieved with red brick. The ground floor will be reserved for station purposes, and there will be new waiting-rooms and a new booking-hall, 120 ft. long by 70 ft. in breadth. The whole of the works have been designed under the supervision of Mr. Charles L. Morgan, the Company's Engineer.

NEW PREMISES, UNBRIDGE-ROAD.—A block of seven shops, with flats over, is to be erected in Unbridge-road, having a frontage of 202 ft., with return frontages to Ormiston and Bloemfontein roads, at a cost of (including the site) 20,000l. The elevation is to be in red bricks, with gauged work and Bath stone dressings, and the roof covered with green slates. The contract has been signed, and the work is to be proceeded with immediately. Messrs. L. Whitehead and Co. are the contractors, and the architects are Messrs. Palgrave and Co.

NEW LABORATORY, FRAMLINGHAM COLLEGE.—A physical laboratory has been built at this school from the plans of Mr. G. F. Bisshopp, of Ipswich. The building work has been undertaken by Mr. W. H. Gibbs, of Saxmundham, and the apparatus supplied by Messrs. Townson and Mercer, London.

THE ROYAL HORTICULTURAL SOCIETY'S NEW HALL.—The new hall and offices of the Royal Horticultural Society have just been opened by the King. The site of the new building is in Vincent-square, Westminster, behind the Army and Navy Stores, in Victoria-street. It contains 18,000 sq. ft., and has been secured on lease for 999 years at a ground-rent of 690l. per annum. Mr. Edwin Stubbs, the architect, has built upon it a hall which measures 142 ft. by 75 ft., and which, with the two annexes opening into it, each 47 ft. by 24 ft., gives a total floor space of nearly 13,000 superficial feet. The new hall is lighted by a roof constructed entirely of glass, and the annexes are lighted from it and by large round-headed windows on the ground floor of the front elevation. The main entrance for visitors is by the door in the middle of the building facing Vincent-square, and for plants the door is at the end of the hall abutting on Bell-street; but there are also subsidiary entrances and exits, one out of each annex and one on each side of the plant entrance, while there are two other doors in the front which can be used as emergency exits, one leading to the stairs and lift up to the

library and offices, and the other to the lecture-room. The exhibition hall and the entire building are heated by radiators and lighted by electricity. The lecture-room occupies the whole of the east wing on the first floor of the front building, and is fitted with an electrical lantern. In the west wing of the same floor are three committee-rooms. The east wing of the second floor will be devoted to the administrative work of the society. This includes the council-room, secretary's and clerks' offices, waiting-room, etc. In the west wing of the second floor will be housed the library of the society, with which is included the collection of horticultural works known as the "Lindley Library."

APPOINTMENTS.

DERBYSHIRE.—The notice of the appointment of Mr. Widdows last week should have read that he was appointed Surveyor to the "Derbyshire" Education Committee, not "Derby" as printed.

SANITARY AND ENGINEERING NEWS.

SEA WALL, MILLOM.—On the 20th inst., at Hodbarrow Mines, Millom, the sea was finally shut off from the large area enclosed by the new sea wall at dead low water. In the presence of the directors and representatives of Messrs. John Aird and Co., contractors, and Messrs. Coode, Son, and Matthews engineers, the sluice-gates, four in number, were shut down. This wall is a mile and a quarter in length, and protects the workings of the mines from the inroads of the sea.

WATER SUPPLY, BIRMINGHAM.—The Elan Valley Waterworks were inaugurated by the King and Queen last week. The scheme, which was prepared and carried out by Mr. James Mansergh, F.R.S., Past-President of the Institution of Civil Engineers, has been eleven years in execution, the total cost up to date being 5,885,000l. The catchment basin, acquired by the City of Birmingham 30 miles away among the Welsh hills, is 12½ miles long from north to south, and 8½ miles from east to west, and embraces an area of 71 square miles. Over this watershed the average rainfall is 63 in. per annum, and the storage provided under the scheme is sufficient to maintain in a dry year a supply of 75,000,000 gallons a day for 200 days, in addition to 27,000,000 gallons a day for compensation water to the river Elan. The entire scheme in the Elan valley comprises a series of six reservoirs on the rivers Elan and Claerwen, the construction of the other reservoirs on the Claerwen river is postponed until the requirements of Birmingham necessitate further storage. From the waterworks an aqueduct, 73 miles in length, will convey the water to the service reservoir at Frankley, 7 miles from Birmingham. The aqueduct is now complete in its entire length, consisting of 13½ miles of tunnel, 23 miles of covered conduits, and 37 miles of double iron siphons. A feature of the scheme is that the water will be filtered at the head of the aqueduct, in order to avoid the growth of a deposit in the pipes. The thirty filter beds, which are now approaching completion, form the site of the inaugural ceremony performed by the King. For the accommodation of the 2,000 workmen employed, a model village was erected, with a hospital, school-room, public hall, bath-houses, canteen, and fire-brigade depot. The Craig Goch dam holds in check the highest artificial lake that has been formed on the Elan river. Its height is 120 ft. and its length 520 ft., and the reservoir thus formed, at a height of 1,040 ft. above Ordnance datum, has a surface area of 217 acres, with a storage capacity of 2,000 million gallons. It is spanned by a viaduct connecting the roads on the opposite sides of the river. Next to it, and at a level of 95 ft. lower, is the Pen-y-gareg reservoir, with an area of 124 acres, and a capacity of 1,300 million gallons. The dam containing it is 123 ft. in height by 500 ft. in length.

FOREIGN.

FRANCE.—M. Pascal is carrying on actively the new buildings of the Bibliothèque Nationale, Rue Vivienne, which will soon be completed. Between these buildings and those of Rue Colbert now rises an immense rotunda in stone, to be roofed with a steel cupola, which will cover the new reading-rooms. This part of the work will take at least a year to

complete.—The restoration of the church of St. Pierre at Montreux is also in progress; the estimated cost is 140,000 francs. The Fine-Arts Department has at last taken in hand the work for the arrangement and furnishing of the Château de Malmaison, commencing with the apartments of the ground and first floors, which are of special historical interest.—The jury in the competition for a church at Colombarius has selected, for the second and final competition, the designs of MM. Duval and Robiña, Felicien Bailly, Emile Brunet, Jardel, Despeyroux, and René Berger.—M. Chedanne has been commissioned by the King of the Belgians to transform the mansion lately occupied by the Princesse Napoléon, in the Rue de Berri, so as to fit it for occupation as the Belgian Embassy.—M. Emile Robert, architect, of Clamart (Seine), has obtained the first premium in the competition for the new cathedral of St. Andrew at Patras in Greece.—The Académie des Beaux-Arts has awarded the "premier grand prix" in architecture to M. Ernest Hébrard, pupil of MM. Guinain and Scellier de Gisors.

A large hospital has been opened at Lisieux. M. Campervaux is the architect. A new Post Office establishment is to be built at Lyons, at a cost of nearly 700,000 francs.—The death is announced, at the age of forty-five, of M. Théophile Landry, architect, and member of the Société Centrale. He was a pupil of MM. Moyaux and André. He carried out numerous private residences, in particular a chateau, in the style of Louis XIII, in the Landes; he was also architect of the Mahemann hospital at Neuilly.

GERMANY.—An official report received at the British Foreign Office states that the project of building a tunnel underneath the river at Hamburg, so as to provide a more satisfactory connexion between the two sides of the harbour, seems likely to be carried into effect at an early date, and the work will, it is stated, be undertaken by a Frankfort firm for about 425,000.

UNITED STATES.—The Governor of Massachusetts has appointed a commission to consider the revision of the existing building laws of the Commonwealth. The Commission consists of an architect, a lawyer, and a real estate trustee. At present, the State laws are mainly concerned with the proper building and maintenance of factories, schoolhouses, hotels, and public buildings, but as the State becomes more thickly settled, the State Police, upon whom rests the enforcement of these laws, find it desirable to give more and more attention to the methods of building employed in mill villages and small factory towns, which, as yet, have no local code of laws of their own; and for this reason it has become advisable to add to the present laws some of the refinements of particularisation that belong to city building codes.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. E. Stanley Mitton, architect (Birmingham), has removed from Oxford-road, Moseley, to 11, Ocean-chambers, Waterloo-street, Birmingham.—Messrs. Pearson Brothers and Campbell, slate importers and merchants (Liverpool), have removed their offices from 5, Castle-street, to 13, Water-street, Liverpool.

The Hydraulic Brick and Stone Company (Liverpool) have removed their offices from 5, Castle-street, to 13, Water-street, Liverpool.—Mr. Lewis F. Day is removing from 13, Mecklenburg-square to 15, Tavilton-street, Gordon-square, W.C.—The Cloissonés Glass Company have removed from 66, Berners-street to 9, Berners-street.

THE CORPORATION RECORDS, LONDON.—During the past twelve months Dr. Sharpe has completed and issued a calendar of the Letter Book "E" and has added an exhaustive index with the aid of Mr. Herbert Trotter. A similar calendar for Letter Book "F" is also ready for issue. The period of fifteen years ending with 1352 relates to a record of civic history when King Edward III. was waging war for the possession of the French crown and the Duchy of Aquitaine, the campaign including the naval victory of Sluys, the battle of Crecy, and the surrender of Calais. The Letter Book "E" contains an account of the storage of guns and gunpowder at the Guild Hall of the City, and the King's despatch to the citizens describing his strategic dispositions for meeting the French forces at Crecy.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on the 21st inst. at the Society's House, 7, Dead-end, Westminster, Abbey, S.W., the Rev. Canon C. E. Norman in the chair. Grants of money were made in aid of the following objects—viz., building new churches at Fern-

dale, St. Dunstan, Glamorgan, 100l.; Manselton, St. Michael and All Angels, near Swansea, 150l.; Wandsworth, St. Mary-the-Virgin, Surrey, 150l.; and Luton, St. Saviour, Beds, 275l., in lieu of a former grant of 250l.; rebuilding the churches at Chepstow, St. Mary, Mon., 25l., making in all 75l.; Kirby Woodhouse, St. John, near Nottingham, 60l.; and Skelmersdale, St. Paul, near Trimsirk, 105l., in lieu of a former grant of 55l.; and towards enlarging or otherwise improving the accommodation in the churches at Armley Hall, Holy Trinity, near Leeds, 10l.; Babraham, St. Peter, near Cambridge, 10l.; Barnes, St. Mary, Surrey, 75l.; Fobbing, St. Michael, near Stanford-le-Hope, Essex, 30l.; Gainsborough, St. John, Lincs, 10l., making in all 110l.; Stonebridge, St. Michael and All Angels, Middlesex, 50l., making in all 130l.; Tilsworth, All Saints, Beds, 25l.; and Wrentham, All Saints, near Norwich, 20l. Grants were also made from the special Mission Buildings Fund towards building mission churches at Cwmllwdder, near Pontypool, 55l., and Merrymont, near Liskeard, 55l. The following grants were also paid for works completed:—Thurleston, Christ Church, near Kingsbridge, 25l.; Moreleigh, All Saints, South Devon, 10l., on account of a grant of 20l.; Dalston, St. Philip, 20l.; Dovercourt, St. Augustine, Essex, 60l.; Wilmington, St. Mark, near Hull, 50l.; Balsall Heath, St. Barabas, near Birmingham, 300l.; Westcliffe-on-Sea, St. Andrew, near Southend, 100l.; Mold Green, Christ Church, near Huddersfield, 55l.; Mark, Church of the Holy Cross, near Highbridge, 40l.; Snargate, St. Dunstan, Kent, 5l., balance of a grant of 15l.; Hull, St. Augustine, 10l., on account of a grant of 20l.; Ilfracombe, St. Peter, Devon, 130l.; Whitwick, St. George, near Ashby-de-la-Zouche, 75l.; Walthamstow, St. James, Essex, 250l.; Gilling, St. James, Middlesex, 75l.; Hornsey, St. Luke, Middlesex, 75l.; Bettws Ewan, St. John, near Newcastle, Emlyn, 20l.; Newlyn, St. Andrew, near Penzance, 40l.; and Newport, St. Luke, Mon., 100l. In addition to this the sum of 295l. was paid towards the repairs of thirteen churches from trust funds held by the Society. The Society likewise accepted the trust of a sum of money as a repair fund for the Church of St. Mary, Great Ilford, Essex.

INSTITUTION OF HEATING AND VENTILATING ENGINEERS.—The sixth summer conference in connexion with the Institution of Heating and Ventilating Engineers (Incorporated) was held on the 22nd inst. at the Hotel St. George, Liverpool. Mr. Palmer, of Liverpool, President for the year, occupied the chair. Amongst those present were ex-Presidents Messrs. Walter Jones (Stourbridge), Louis F. Pearson (Beeston), and W. R. Maguire, J.P. (Dublin); Vice-presidents Messrs. S. Naylor (Halifax), G. Crispin (Bristol), Taylor, hon. treasurer (London), W. Nelson (London), (Trowbridge), and R. E. Atkinson (Leicester); Messrs. T. Pottertout (Balham), E. W. Mayer (Redhill), W. Yates (Swinton), A. B. Simpson (Pimlico), C. J. Haden (Trowbridge), and C. Barter (Birmingham), members of the Council; and Mr. Arthur Taylor (London), Secretary. At the general meeting held in the afternoon of the first business transacted the election of four new members from Croydon, Peckham, London, Birmingham, and Berlin, and two associates from Darlington and Brook Green, London. Interesting papers were contributed by Mr. George Chasser (Stourbridge), who was awarded first prize in the assistants' competition in 1903, on "An Inquiry into the Waste Heat from Gas-engines, with Some Suggestions for its Useful Application"; by Mr. Walter Yates, M.I.Mech.E. (Swinton), on "Mechanical Draught for Boilers"; and by Mr. Chas. Barter (Birmingham), on "Smokeless and Economical Burning of Fuel." Mr. Louis F. Pearson, referring to Mr. Chasser's paper, said the competition had proved so interesting that the Council of the Institution were offering this year three prizes of higher value. The papers were of a purely technical character, and gave rise to considerable discussion. It was decided that the next meeting should be held in London on October 13. In the evening the delegates sat down to dinner at the Hotel St. George, under the presidency of Mr. John S. Palmer. The toast list included "The Institution," "The American Society of Heating and Ventilating Engineers," "Our Visitors and Guests," and "The Local Committee." Councillors Joseph H. Jones and Boote delivered brief addresses. Nearly 900 books were distributed, this function being undertaken by Mrs. Joseph.

ST. JAMES'S CHURCH, WORSBORO' BRIDGE, BARNSELY.—This church was re-opened recently, after clearing and decoration. The nave walls have been covered with diaper work, and elaborate borders; and a large group of angels, on a blue background, has been painted over the chancel arch. The

work has been designed and executed by Messrs. Powell Brothers, of Leeds, who also executed the east window.

NEW ORLEANS TIMBER TRADE.—It is stated in an official report that, during the year 1903, the trade in every description of New Orleans wood was prosperous, and that a steadily increasing growth of exportation is to be noticed. Ten years ago shipments of wood were of little importance, but now timber has become one of the leading staples and a factor in the ocean-carrying trade from the port. The forest lands of the Mississippi valley, some 500 square miles in extent, which New Orleans is the natural outlet, abound in valuable timber. The most important kinds are oak, ash, hickory, walnut, cottonwood, gum, pine, and cypress. The last-named has the valuable quality of being avoided by the white ant, and on this account is shipped from New Orleans to every part of the globe ravaged by that pest. Every tree when felled is taken to one of the numerous saw-mills to be sawn into lumber for shipment from New Orleans. Most of the wood arrives there by rail, but some still comes down the river in barges. It is all taken alongside the ships, without breaking bulk, for transmission principally to the United Kingdom, Denmark, France, Germany, and Holland. A great deal of yellow pine and cypress is also exported from Jacksonville, the trade having been the largest ever known in that city. Direct shipment to Liverpool by steam and sail has commenced. At present the docks are all overstocked with lumber for want of sufficient steamers to carry it away.

THE WALLS OF BERWICK.—Mr. Bryce having inquired in Parliament whether any arrangement had been made for the preservation of the Edwardian walls of Berwick-on-Tweed as an historical monument of exceptional antiquity and interest, and, if so, what were the terms of that arrangement, Lord Balfour replied:—Negotiations are in progress between the Town Council and the Office of Works. It is understood that the Committee of the Town Council is to submit its report in the first week in August, and it is hoped that satisfactory arrangements will be made for the protection and maintenance of these historic remains.

THE OBELISK.—The Southwark Borough Council recently applied to the Corporation to be allowed to remove the well-known Edwardian obelisk in the Southwark, to be attached to the erection on its site of an ornamental clock-tower to be presented to the Borough. The Bridge Houses Estate Committee, on whose property the old land mark stands, are in favour of the application provided that the design and material of the clock-tower and the inscription on it are approved by them, that no advertisements are permitted, that the Southwark Borough Council pay all the costs of the removal and re-erection of the Obelisk on a spot to be hereafter agreed upon, and that such other conditions as the Committee may impose are fulfilled.—*The Times*.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—According to returns supplied by eighty-two employers' associations, whose members are estimated to employ about 92,500 building operatives of all classes, and by trade unions with an aggregate membership of about 194,700, an employment in the building trade generally continued dull during June, and the whole showed little change as compared with May. It was rather worse than a year ago. With bricklayers, employment is reported as dull, but better than a month ago, and much the same as a year ago. Employment with masons is fair in England, dull in Scotland and Ireland. With carpenters and joiners employment is dull. The percentage of unemployed trade union carpenters and joiners was 63 at the end of June, compared with 59 in May and 54 a year ago. Employment with painters generally has been dull and rather worse than a month or year ago. It has been dull also with plasterers and plumbers. The percentage of unemployed trade union plumbers was 99 at the end of June, compared with 92 in May and 76 a year ago. Slaters and tilers report employment as dull in England and Ireland, fairly good in Scotland.—*Labour Gazette*.

Legal.

ACTON ANCIENT LIGHT DISPUTE.—In the Chancery Division, on the 23rd inst. Mr. Justice Kekewich resumed the hearing of the case of Kine v. Jolly, an action by the

plaintiff, Mrs. Sarah Kine, the owner of a house and premises, known as "Woodthorpe," Aecia-road, Acton, against the defendant, for an injunction and damages for the alleged obstruction of her much diminished light and also for alleged trespass. His lordship had the case before him on the 12th, 13th, and 14th insts., a report of the proceedings appearing in the *Builder* of last week.

Mr. P. O. Lawrence, K.C., and Mr. Cann appeared for the plaintiff, and Mr. Stewart Smith, K.C., and Mr. Vernon for the defendant.

Mr. Wm. Eydmann, examined by Mr. Lawrence, said he was an auctioneer and licensed valuer, and had practised as such in Acton for twenty years. He had sold and let numerous kinds of house property in Acton. He had known "Woodthorpe" and its surroundings for the last twenty years. He knew the former tenant, Mr. Virgo, and had frequently been into the house during his tenancy. He had visited the house during the last fortnight at all times of the day. He found the light coming to the morning-room and the hall very much diminished owing to the erection of Dr. Jolly's house. He considered that the loss of light had reduced the letting value of the plaintiff's house by 25% a year. He thought the selling value of the freehold was reduced by 450%.

Cross-examined by Mr. Stewart Smith, What do you say the value of this house was before Dr. Jolly's house was put up?—2,160%.

In your opinion, has the freehold value of the house risen during the last five or six years?—Well, I do not think it has increased in value much.

Cross-examination continued. He should not be surprised to hear that the property about 1895 sold for 1,500%. It was very likely that Mrs. Kine purchased the property for 1,675%.

Mr. Lawrence said that Mrs. Kine purchased the property in March, 1902.

Cross-examination continued. In the immediate neighbourhood of the plaintiff's house, about 100 houses had been put up during the last five years. About 80 per cent of those houses were of a rental value of 40% to 45% a year. Some of the houses were let to two families.

So that, apart from the question of light, it is rather an advantage to have a house of the class built by Dr. Jolly next door to "Woodthorpe," than to have a 40% a year house?—Oh, undoubtedly.

Cross-examination continued. The width of Dr. Jolly's plot was about 50 ft. There was nothing unusual in the height of Dr. Jolly's house for a house in a suburban neighbourhood on a plot of that kind. The letting value of the plaintiff's house, without the light obstructed, was 120% a year. He estimated the rental value now at 95% a year. In that estimate he had not taken the obstruction of light to the drawing-room into consideration at all; but only the obstruction to the morning-room and the hall. The footing on which he had made the deduction was, that the house now was less agreeable as a residence than formerly.

Do you attribute the diminution in value to the loss of cheerfulness?—Quite so. The rooms are darker, and therefore it is less cheerful naturally.

You do not suggest that the morning-room could not be used for the ordinary purposes of a morning-room?—That would depend on the time of year.

You will not pledge yourself to anything more definite than that?—No, I could not.

Mr. E. B. Athawes, an auctioneer, surveyor, and estate agent, examined by Mr. Lawrence, said he was a member of the Urban District Council of Acton, and a member of the Assessment Committee of the Brentford Union, and valuer of the assessments for the purposes of the King's taxes. He had valued every house in the neighbourhood for a number of years for the purposes of the King's taxes. He remembered "Woodthorpe" being built. He considered there was a considerable loss in the letting value of the house owing to the loss of light. He put it at 20% a year. He put the loss of the selling value at 370%.

Cross-examined by Mr. Stewart Smith, He put the capital value of the plaintiff's house, on the assumption that Dr. Jolly's house was built in a reasonable position, at 2,035%. This concluded the plaintiff's case.

Mr. E. B. Athawes, an architect, examined by Mr. Stewart Smith, said he had had a large experience in valuing property in this immediate neighbourhood. He thought there was no diminution in the letting or selling value of the plaintiff's house by reason of the erection of Dr. Jolly's house.

Cross-examined. There was no material diminution of light at all.

Mr. Chas. Augustus Laing, a surveyor and estate agent, examined, said he recollected

the plaintiff's house being built. The neighbourhood had altered in character of late years, and smaller houses being built caused larger ones to depreciate in value. He did not consider that there was any diminution in the letting or selling value of the plaintiff's property by reason of the erection of Dr. Jolly's house.

Cross-examined. In his opinion the present rental value of "Woodthorpe" was 90% a year. He put the capital value at 1,800%.

Mr. H. W. Collier, an auctioneer, surveyor, and estate agent, and Mr. Harold Edward Carter, a surveyor and valuer, also gave evidence generally corroborating that of the last witness. This concluding the evidence in the case, his lordship, addressing Mr. Lawrence, said he wished to hear him on one point only. He considered he was bound by the decision of the House of Lords in the case of the Home and Colonial Stores v. Colls to dismiss the action, unless he was convinced there had been substantial interference with the light of the plaintiff's house. He had said already that he did not intend to dismiss the action, and it followed, therefore, that he thought there was substantial interference with the light of the plaintiff's house. The question, therefore, the learned counsel had to address himself upon was, what was the remedy, and whether he ought to grant a mandatory injunction, or ought he to incline to granting the plaintiff damages instead of granting an injunction.

Mr. Lawrence claimed that he was entitled to an injunction. He had got to prove now nuisance to property or person.

His lordship: In that I am with you.

Mr. Lawrence: In this case I say that although you can assess the value of the nuisance to the property, you cannot properly assess the nuisance to the inhabitants. This is not a case where the plaintiff wants to be turned out of her house, and, therefore, I submit it is a case for an injunction. If you assess damages only it would be making the plaintiff sell her comforts at a price. Therefore, I say, she is entitled to an injunction. The plaintiff is not in want of money. All she wants is the house and home. It is difficult to value such a thing in money. Mrs. Kine bought the house to establish a home for herself, her daughter, her son-in-law, and her grandchildren. All she asks is that you will restore to her the light she formerly had. This is not a case of trying to extort money.

His lordship: I am quite satisfied of that. I am satisfied that there is nothing of that kind.

Mr. Lawrence: I do not say that we will reject damages if you will not grant us an injunction. I ask your lordship to say that this is a case for an injunction.

His lordship said he thought there was some interference with the drawing-room light, but he was of opinion that, on the judgment of the House of Lords in the Colls' case, he was bound to hold that it was not such as would entitle the plaintiff to any relief. He took the morning-room and the hall together. Mr. Stewart Smith must take it that he held there was substantial interference with the light of the morning-room.

Mr. Stewart Smith said that the plaintiff must have contemplated some kind of building on the plot where Dr. Jolly's house stood, and really the damage was the difference between the damage caused by the offending building, and a building which would not offend. His lordship had had no evidence of what such damage would be. He submitted that in this case the injury could, and should, be compensated for in money.

His lordship said he would reserve his judgment. He was rather inclined to awarding damages in mercy to the parties, because probably, if he were to award damages, there would be no appeal, and there would be no increase in the costs, which were already large. If he granted an injunction, he took it that there must be an appeal. All he had to do was, however, to do justice between the parties, and he therefore reserved his judgment.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

14,607 of 1903.—W. REED: *Skirting Dado or Bordering*.

This invention has reference to the improvement in skirting, dado, or bordering, that is to say, to prevent insects from climbing up the walls and partitions of dwellings. Hitherto the skirting dado or bordering of rooms has permitted insects creeping up the walls to the discomfort of those who dwell in the rooms. This defect is overcome by

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

having a dado skirting and bordering composed of smooth glass.

15,421 of 1903.—D. SEGURA: *Connecting or Binding Brackets, and the Like, for Furniture and other rooms*.

In carrying the invention into effect, in its application to a connecting bracket for connecting together the respective adjacent parts of a chair seat frame, a bracket, having two horizontal lateral extending lugs, is provided which are connected together by an arm integral with said lugs, while integral also with said arm vertical downwardly extending lugs are provided. The horizontal lugs serve for being laid upon the horizontal faces of the adjacent extremities of parts of the said frame; while the vertical downwardly extending lugs lie against the vertical face of the adjacent extremities of parts of the said frame. Screws or nails may be passed through the said lugs so that the respective parts of the frame that are connected by the bracket are firmly secured against vertical or lateral displacement.

15,545 of 1903.—C. L. STIFF: *Clayware, Stone-ware, and similar Troughs, Channels, Conduits, and the like*.

Channels, and the like, for bacteria and filter beds, or under drains therefor, having a curved or angular and gapped or perforated face, and longitudinal edge gaps forming lateral openings to the level of the bed or area to be drained and aerated.

15,159 of 1903.—J. MERRILL: *Automatic Discharging and Flushing Siphon*.

The object of this invention is to provide an automatic flushing siphon that will work with either sewage or water, and more particularly in the discharge of bacteria beds and the like. To effect this a trapper siphon is constructed, one part of which is connected to an air chamber placed in or in connexion with an automatic flushing cistern, the discharge of which will cause the main siphon to discharge.

16,399 of 1903.—D. HADLINGTON: *Construction of Brick and Analogous Kilns*.

Kilns for working in series on the continuous system; each kiln having a middle flue in the floor, and flues at the sides, consisting in the employment of main hot-air flues, and an independent main steam flue which are common to the whole of the kilns in the series, and are placed in communication with both the middle and side flues of the kilns, by means of branch flues so arranged, in conjunction with a system of dampers, as to admit of the hot gases exhausted from a firing kiln being conducted along the hot-air flues into either the middle flue or the side flue of a kiln containing goods to be dried off, whereby the drying-off may be accomplished with either an upward or a downward draught, whilst the steam from the drying goods is conducted into the main steam flue from the said flues of the kiln without drying-off with an upward draught, or from the cooling flue without drying-off with a downward draught; the said arrangement also providing for the utilisation of the hot air or hot gases from one or more kilns of the series to promote more perfect combustion in a kiln that is being fired.

17,447 of 1903.—A. H. HIGGINBOTTOM and A. B. LENNOX: *Brick or Briquette-making Machines*.

A machine for making bricks or briquettes, characterised by a series of moulds which are adapted to rotate round an axis, and a plurality of dies or covers for the moulds, said dies or covers being mounted on an endless chain or band, and said band being travelled by and at the same speed as the moulds.

17,684 of 1903.—J. McVEAN: *An Adjustable Work Holder or Clip, particularly applicable for Plumbers' Work*.

This invention relates to an adjustable steady, or clip, particularly applicable for plumbers' work, the object being to provide a steady, or holder, for a coupling when soldering to a pipe, and so dispense with the building up of pipes whilst a coupling is being soldered to the said pipe. The appliance is constructed in tubular form with the bottom end of the tube open and the top end closed, the top portion of the said tube being larger than the bottom, and is preferably constructed pear-shaped. Within the said tube a round rod is employed, which is provided with a cone at the bottom thereof; the top of the said rod being screwed and passed through the top of the pear-shaped tube, at the centre thereof.

18,271 of 1903.—J. DUPONT, SEN.: *A Caster for Furniture*.

A caster for furniture, or other uses, having a pivot, the shank of which is grooved, a roller consisting of two cup-shaped parts, stamped from sheet metal, and a yoke, also stamped from sheet steel, or other metal.

18,373 of 1903.-F. W. ADAMS: *Fanlight Gear or Openers.*

Fanlight gear, consisting in the combination of a link hinged to the fanlight, a sliding block hinged to the link, a three-way guide in which the block is mounted, a spring rod attached to the block extending through the guide, and means, such as a swivel handle adapted to engage a toothed bracket, for retaining the rod in the position to which it is adjusted.

18,547 of 1903.-J. TIPPER: *Manufacture of Bolts for Doors, and the like.*

A barrel bolt, having the plate and barrel formed in a single piece of sheet metal, and tongues also formed in the same piece of sheet metal, and meeting, or nearly meeting, in the plane of the plate in position therealong between the ends of the barrel so as to be behind the barrel.

18,597 of 1903.-G. H. LLOYD: *Manufacture of Pipes.*

Manufacture of pipes, consisting essentially in rolling a bar with a groove in two of its opposing faces, the internal faces of said grooves being waved or curved longitudinally, inserting the plain margins of plates which are bent round to form the pipe into the waved grooves, and finally closing the grooves by pressure, so that the inserted margins of the plates are caused to follow the convexities and concavities of the grooved faces.

18,715 of 1903.-H. F. LUTTEY: *Wall and Table Brackets.*

Making a bracket shelf by forming a suitable blank from flexible sheet material, cutting portion of same through any desired configuration, leaving a piece connecting the cut portion with the blank, and subsequently bending said cut through portion at said connecting piece to form a bracket shelf on said blank.

18,802 of 1903.-W. A. MARSHALL: *Automatic Sprinklers for Fire Extinguishing.*

Sprinkler heads for automatic fire extinguishing, consisting of a strut composed of three parts, one part having a lateral extension, a bearing, and a holder, or its equivalent, and the other parts being held together by a strip.

21,100 of 1903.-G. J. WILLIAMS and G. T. PIGGOTT: *Manufacture of Metallic Facing for Stairs.*

Metal facings for stairs, produced from sheet metal strips by feeding them into and drawing them through a suitable die, combining a mandrel and serrated planing tool, so that the strip issues as moulded and grooved stair facing.

855 of 1904.-J. BRAE: *Ashpans for Domestic Fireplaces.*

Improvements in ashpans for domestic purposes, consisting of an ashpan and sieve combined. The sieve is half the depth of the ashpan, and fits closely within, resting on four bearers, occupying the upper part of the ashpan, the lower part of the ashpan being the receptacle for the ashes. The sieve, which is altogether free in the ashpan, can be lifted out and placed within without unfastening and fastening. The bottom of the sieve is of fine, strong crossed bars sufficiently open to allow the ashes to fall through. The back end of the sieve is made and fixed slantingly to allow the cinders to be thrown off easily.

6,423 of 1904.-C. BAER: *Hinged Windows, and the like, and Means for Closing and Opening the same.*

A watertight window prevented from closing when once opened, in which the window sash has a suitable groove located beneath in its weather rail, which groove engages a suitable projection of a corresponding bar of the window frame, and may there be suitably washed by means of a washing cord, or the like, in such a way that neither wind nor rain can penetrate through the joint of the window and in which a suitable apparatus for raising the sash over the projection of the window frame, for the purpose of opening the window, is provided in such a way that when the window is open it again drops by reason of its own weight, and thereby fixes the lever serving for opening the window—that is to say, prevents the window closing automatically by reason of a draught, gusts of wind, or the like.

10,040 of 1904.-O. DEVILLERS: *Process for the Making of Slabs or Sheets, Imitating Marble.*

A process for manufacturing imitation marble plates, said process consisting in spreading on glass plates the fragments of burst glass bubbles, blown from refined glass of various colours, over which fragments is sprinkled powdered or liquid enamel, with or without the addition of sand, the whole being then fired at a temperature of 800 C., and afterwards allowed to cool gradually.

10,789 of 1904.-W. LIVINGSTONE and S. H. POMEROY: *Pulleys or Wheels for Sashes, and other purposes.*

A sheet-metal pulley, consisting, in combination with the rim, of a tubular sheet-metal hub, comprising two sections arranged end to end, a set of arms integral with each of said sections extending radially from the inner end of the same, each of said sets comprising members of different lengths, the longer of said members having angular portions engaging the rim.

11,372 of 1904.-J. R. NESBITT: *Method of, and Means for, Planning Decorations for Application to Walls, Ceilings, Floors, or other surfaces.*

A method of, and means for, planning decorations for application to walls, ceilings, or other surfaces, consisting in the employment of a suitable surface, having a number of lines ruled or otherwise indicated thereon, and a series of cards, or the like, having upon them designs, or components of designs.

11,606 of 1904.-G. A. HARVEY: *A Cowl for Chimney Flues, Ventilation, and the like.*

A cowl for chimney flues, ventilation, and the like, with a conical ring surmounted by a dome-shaped cover and tubular opening, so arranged as to permit the free passage of air currents.

11,803 of 1904.-J. H. MARLOW: *Manufacture of Tiles, Bricks, and the like.*

The manufacture of tiles, bricks, and the like, by the use of a die, the upper part of which consists of two plates, loosely-connected plungers adjustably connected to the upper plate, and working in slots formed in the lower plate, and a dovetailed piece formed on, or fixed to, the lower plate.

12,022 of 1904.-G. MUSGRAVE, D. MUSGRAVE, and C. and D. MUSGRAVE, LTD.: *Water-closets, and the like.*

A water-closet, or the like, consisting in the combination with the pan or basin of an outlet leg, the down branch of which is internally provided with corrugations, or equivalents so placed or formed as to divert or direct the passing water and cause it to drive the air in the leg-branch before it.

17,152 of 1903.-E. WILDING, T. CATERALL, and J. WARRISON: *A Method of Securing or Fastening Scaffolding-poles Together by Means of a Clip or Clips.*

This improvement, consists of a pair of wrought-iron steel or malleable-iron clips, for the erection of scaffolding used in the construction of buildings, instead of the old method of lashing the scaffolding-poles together with ropes.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

Table listing property sales with columns for location, date, and price. Includes entries for Cricklade, Wiltshire; Breydon, Wiltshire; Parkgate Farm; Mansfield Farm; High Barn Farm; Ravenstoot Farm; Purton, Wiltshire; Cricklade, Wiltshire; Woodnesborough, Kent; Bovingdon, Herts.; Three-level meadows; The Pightle and Hart's Hill Enclosures; Wellington, Somerset; Paddock Wood, Kent; Yalding, Kent; West Pike Fish Farm; Collier-st., Kent; Little Vale; and Wandsworth, Surrey.

Table listing property sales with columns for location, date, and price. Includes entries for Broad-st., Surrey; Broad-st., Surrey; By Nicholas, Denyer, & Co.; 250 a. 0 r. 25 p. f.; Stockbury, Kent; 3 r. 34 p. f.; House, shop, and 0 a. 0 r. 30 p. f.; Upper Velsled Field; Hop Garden; Fruit, hop, and wood lands; 19 a. 0 r. 23 p. f.; 19 a. 0 r. 23 p. f.; By T. W. GAZE & SON; Drayton, Norfolk; Hevingham, Norfolk; Acton; 44, Creswick-rd.; Ealing; 37, Lavington-rd.; Battersea; Wintledon; Shaftebury-av.; Camden Town; Caunden Town; 11, St. Augustine's-rd.; Stoke Newington; Peckham; Chelsea; 48, Oakley-st.; Fulham; Westminster; By DORE, FIELDER, & MATTHEWS; Little Hinton, Wilts.; Upton Park; Forest Gate; Walthamstow; Kennington; Brondesbury; City of London; Notting Hill; Carnforth; Clapham; Streatham; Bournemouth; Clapton; Wood Green; Tottenham; Limehouse; Norwood; Stroud Green; Finsbury Park; Horsely; Wandsworth; Battersea; Cliffe; and Snodland.

TILES (continued). s. d. Best "Rosemary" brand plain tiles, 48 0 per 1000 at rlv. depot

WOOD. At per standard. Deals: best 3in. by 11 in. and 4 in. 2 s. d. 15 10 9

JOINTERS' WOOD. At per standard. White Sea: first yellow deals, 3 in. by 11 in. 23 0 0

JOINTERS' WOOD. At per standard. White Sea: first yellow deals, 3 in. by 11 in. 23 0 0

JOINTERS' WOOD. At per standard. White Sea: first yellow deals, 3 in. by 11 in. 23 0 0

JOINTERS' WOOD. At per standard. White Sea: first yellow deals, 3 in. by 11 in. 23 0 0

JOISTS, GIRDEES, &c. In London, or delivered Railway Vans, per ton. Rolled Steel Joists, ordinary sections 6 5 0

METALS (continued). Per ton, in London. Iron (continued) £ s. d. Hoop Iron, basis price 9 3 0

LEAD, &c. Per ton, in London. LEAD—Sheet, English, 3lb. and 14 7 6

ENGLISH SHEET GLASS IN CRATES. 15 oz. thirds 23d. per ft. delivered. 21 oz. thirds 23d. "

OILS, &c. £ s. d. Raw Linseed Oil in pipes, per gallon 0 1 6

VAENISHES, &c. Per gallon. £ s. d. Fine Pale Oak Varnish 0 8 0

BRIGHTON.—For glazed drain pipes for year ending July 31, 1905, for the Corporation. Mr. F. J. C. Borough Engineer and Surveyor, Town Hall, Brighton:—

TO CORRESPONDENTS.

A. A. T.—J. E. (Below our limit).—A. P.—R. (Amount should have been stated).

NOTE.—The responsibility of signed articles, letters and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents sent to left at this office, unless he has specially noted them.

Letters or communications (beyond new news items which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books giving addresses.

Any communications sent to a contributor to write an article or to execute or lead a drawing for publication, is held subject to the approval of the article or drawing, if received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of proof of an article in type does not necessarily imply acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR, the name and address of the sender, whether for publication or not, should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

WEDNESDAY, AUGUST 3. Builders' Foremen and Clerks of Works Institution, Ordinary Meeting of the Members. 8 p.m.

MONDAY, AUGUST 8. British Archaeological Association.—Annual Congress opens at Bath.

Institute of Sanitary Engineers, Ltd.—Organising Committee at 3 o'clock. Examination and Literary Committee at 5 o'clock. Council Meeting at 7 o'clock.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the name of the Tender is stated, nor any list in which the Tender is under 1000, unless in some exceptional case and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

ALTOFTS.—For new footpaths, Altofts, Wakefield the Altofts Urban District Council. Mr. J. C. Co. Surveyor to the Council:— J. Dewes £131 2 6 H. Parkinson. £114 T. Egan & Sons 127 7 9 E. Rothera .. 91 R. Teake & Sons, Normanston* 118 2 3

ANNFIELD PLAIN.—For laying out new 1 ground at Harehew, for the Urban District Council. Mr. T. J. Trowsdale, Surveyor, Annfield Plain:— Bushby & Sons £1,580 0 0 J. W. White £1,297 7 J. Craven 1,581 6 8 R. T. John Shanks 1,515 4 5 son 1,217 W. Kennedy Rendle & Sons 1,384 6 6 Collins 1,211 W. G. Armstrong J. Dunn, Annfield Plain* 1,291 10 9 field plain* 1,168 3

BRACKNELL.—For extensions of sewers in E. end, for the Easthamstead Rural District Council. Mr. C. Yorks, Surveyor, Wokingham-road, Bracknell:— S. Lewis & Son, £774 0 0 T. Free & Sons, £72 Collier & Catley, W. J. May, Ltd. 766 0 0 Bracknell* .. 66 E. C. Hughes 749 0 0 T. Turner .. 66

BRAINTREE (ESSEX).—For kerbing and channelling works—making-up Victoria-street, Baintree-to Urban District Council. Mr. H. H. Nankivell, Surveyor Vestry Hall, Baintree:— R. A. Bonnett & Co., Chelmsford .. £370 4

BRIGHTON.—For glazed drain pipes for year ending July 31, 1905, for the Corporation. Mr. F. J. C. Borough Engineer and Surveyor, Town Hall, Brighton:—

Per Cent. Below Schedule Prices. 4 in. 6 in. 9 in. 12 in. 15 in. 18 in. J. Crankshaw & Co., Ltd. 55 55 55 55 55 55

* And 3½ per cent. off net amount for all sizes. † And 2½ per cent. cash discount. * And 2½ per cent. cash discount for monthly payments.

South Hackney, Rushmore-road (Painting Interior).
 H. Bouneau £301 0
 W. Silk & Son 498 10
 H. R. Unham 498 0
 W. Bouneau 410 0
 Barrett & Power 407 11
 C. Dearing & Son 407 11

South Hackney, Sidney-road (Painting Interior).
 H. R. Unham £426 0
 H. Bouneau £532 0
 Barrett & Power 448 7
 W. Bouneau 440 0
 R. Woodlston & Co. 430 0

Peckham, Newland-passages (Painting Interior).
 H. L. Howie £553 0
 W. J. Howie 387 0
 J. Garrett & Son 508 0
 H. Holliday & Greenwood 442 0
 Maxwell Bros. 498 0

Battersea, Mantus-street (Painting Interior).
 E. Flood £579 0
 R. E. Williams & Sons 459 0
 J. Carmichael 460 0
 R. A. Jewell 437 0
 E. Triggs 437 0

Clapham, Ponton-road (Painting Interior of all Buildings).
 E. Flood £149 0
 R. S. Ronald 140 0
 Rice & Son 130 0
 Lathley Brothers 135 0
 J. F. Ford 135 0

Bernersday, "Alma" (Painting Interior).
 W. Sayer & Son £351 0
 H. Holliday & Greenwood, Ltd. 328 0
 Wood, Ltd. 304 0

Mile-end, Essex-street, B., G., L., and P.T. (Painting Interior).
 J. Dolman & Co. £486 0
 G. Barker 486 0
 A. E. Symes 485 0

St. George-in-the-East, Bets-street (Painting Interior).
 Vigor & Co. £311 0
 A. J. Sheffield 295 0
 H. Bouneau 294 0
 G. Barker 274 0

Holborn, Bosbery-avenue School (Partitions).
 Barrett & Power £321 7 6
 C. Dearing & Son 248 0
 W. Martin 238 0
 G. S. S. Williams & Son 230 0

Central Finsbury, White Lion-street (Partitions, etc.).
 C. Dearing & Son £135 0
 Barrett & Power 103 12 0
 G. S. S. Williams & Son 89 0

West Islington, York-road (Heating Apparatus, etc.).
 Clark, Bunnell, & Co. £296 0
 Lancashire Heating Co. 210 0
 Polowkar & Sons 203 0

Levisham, Brockley-road (Cupboards, Benches, etc. in Art Room).
 H. Bouneau £160 0
 E. Spencer & Co. 144 0
 G. M. Hammer & Co., Ltd. 118 0
 Lascelles & Co. 115 0

Poplar, Culloden-street (Electric Motor for Propulsion Apparatus).
 J. Eason & Son £192 3 0
 Electrical Co., Ltd., 121, Charing Cross-road, W.C. 103 0 0

† If with iron case to contain the motor starter and main switch, with an ammeter mounted in it, the extra price would be £9 15s.

For a 3-cvt. Lift.
 Waygood & Co. £165 0
 Jessop & Appleby 120 0

(Messrs. Waygood & Co. also submitted an alternative tender of a stock pattern lift for the same load, for £55 delivered and erected, and including a provisional sum of £15, which was accepted.)

For Steam-Heating of the L.C.C. School of Building, Penelope-road, Brixton.
 Rosser & Berdell, Ltd. £1,518 0
 Ashwell & Nesbitt 1,438 0
 T. D. Berry & Sons 1,327 0
 R. Crittall & Co. 1,315 0
 Wenham & Waters 1,245 10
 Strode & Co. 1,228 0
 Jones & Attwood, Stourbridge** 1,081 0

† Alternative tender, £1,014. ‡ Add for vacuum pressure trap, vacuum governor and action strainer, £38. § Alternative tender with Beeston radiators, £1,047. * Alternative tender with Tuscan radiators, £1,097. ** Add for patent rights, £125.

Hampstead, New End (New L.C.C. School).
 (a) That Messrs. Lavranic & Sons be allowed to withdraw their tender for the erection of the new school on the New End site, Hampstead.—Agreed.
 (b) That the estimate of £2,132, submitted by the Finance Committee be approved; that expenditure not exceeding that amount be sanctioned in respect of the new school; that the tender of Messrs. Treasure & Son, amounting to £20,829, be accepted.—Agreed.

Highbury Truant School (for Additional Boiler).
 G. & E. Bradley £515 0
 J. & F. May 610 0
 C. Kite & Co. 450 0
 Wippell Bros. & Row. 415 0

Woolwich, Poplar-street (Painting of Premises).
 E. P. Bulled & Co.* At Schedule of prices.
 Woolwich, Deansfield-road (New School).
 J. & C. Bowyer* £21,953

FOR PAINTING EXTERIOR OF SCHOOLS.

Bethnal Green, Abbey-street.
 J. Grover & Son £137 0 0
 W. Silk & Son 127 0 0
 H. Bouneau 126 15 0
 J. Haydon & Sons 108 12 0

Battersea, Bonnet-road.
 C. Gurling £196 0 0
 Rice & Son 184 0 0
 R. E. Williams & Sons 160 0 0
 J. Garrett & Son 151 0 0

East Finsbury, Bath-street (B., G., L., and Special).
 Parrott & Isom £495 0 0
 T. C. Pringle 321 0 0
 P. A. M. A. & Rotheringham, Ltd. 320 0 0
 F. W. Harris 289 0 0

Chelsea, Beetham-street.
 G. H. Sealy £218 4 0
 S. Polden 155 0 0
 F. T. Chidley & Co. 139 10 0
 W. Clappell 135 0 0

Clapham, Belleville-road.
 E. Flood £430 10 0
 R. A. Jewell 270 0 0
 Martin, Wells, & Co., Ltd. 258 0 0
 J. Garrett & Son 243 0 0
 E. B. Tucker 219 0 0
 Hudson Bros. 219 0 0

Hammersmith, Brackenbury-road (Omitting Boys' Offices).
 W. R. & A. Hyde £205 0 0
 S. Polden 193 0 0
 W. Hammond 174 0 0
 F. Chidley & Co. 170 0 0

Deptford, Canterbury-road (Junior Mixed).
 Rice & Son £111 0 0
 Holliday & Greenwood, Ltd. 96 0 0
 W. Sayer & Son 92 10 0

Bernersday, "Chaucer."
 Lathley Bros. £348 0 0
 W. Sayer & Son 331 0 0
 Holliday & Greenwood, Ltd. 329 0 0
 J. Appleby & Sons 300 0 0

Peckham, Colls-road.
 W. Hooper £283 0 0
 Rice & Son 270 0 0
 Holliday & Greenwood, Ltd. 269 0 0
 W. V. Good 257 0 0

Chelsea, Droop-street.
 G. H. Sealy £252 11 6
 W. R. & A. Hyde 173 0 0
 W. Hammond 145 0 0
 F. Chidley & Co. 143 0 0

Dulwich, "Dulwich Hamlet."
 Lathley Bros. £167 0 0
 H. C. Crooks 160 0 0
 H. Leney & Son 129 10 0
 Leonard & Mason 104 0 0

Rotherhithe, Fair-street.
 Lathley Bros. £187 0 0
 W. Sayer & Son 184 0 0
 W. Banks 174 16 8
 W. J. Howie 165 0 0

South Kensington, Gloucester-road (B., G., L., and Special).
 W. Sayer & Son £289 0 0
 Greenwood, Ltd. 284 0 0
 J. Appleby & Co. 301 0 0
 W. Banks 294 13 6

Whitechapel, Hanbury-street (B. and G.).
 H. Bouneau £155 10 0
 J. Haydon & Sons 153 10 0
 G. S. S. Williams & Son 149 0 0
 Barrett & Power 149 0 0

South Islington, Haver-street.
 F. W. Harris £315 0 0
 G. S. S. Williams & Son 294 0 0
 C. Kirby 240 0 0
 Patman & Fotheringham, Ltd. 230 0 0

Bow and Bromley, High-street.
 Parrott & Isom £425 0 0
 H. Bouneau 311 0 0
 G. Barker 295 0 0

Fulham, Langford-road.
 C. Gurling £243 0 0
 H. C. Patrick 214 0 0
 W. Hammond 183 0 0
 E. Flood 174 0 0
 Lathley Bros. 171 0 0

Bow and Bromley, London Fields.
 F. Bull £290 0 0
 W. Shurmar & Sons, Ltd. 283 0 0
 Barrett & Power 280 0 0
 W. Silk & Son 257 10 0

Deptford, Lucas-street (Old Portion).
 H. Leney & Son £121 10 0
 H. Groves 93 0 0
 W. J. Howie 90 0 0
 C. G. Jones 77 4 8

Haggerston, Maidstone-street.
 W. Silk & Son £181 10 0
 R. Woodlston & Co. 170 0 0
 J. Grover & Son 167 0 0
 C. Willmott & Son 164 0 0

Bow and Bromley, Malnesbury-road.
 A. E. Symes £254 0 0
 H. Bouneau 232 0 0
 Vigor & Co. 215 0 0
 G. Barker 215 0 0

South-west Bethnal Green, Mansford-street (S. M. and Special).
 F. T. Chidley & Co. £100 0 0
 T. Cruxys 148 10 0
 G. Kirby 146 0 0
 Stevens Bros. 123 10 0

South Hackney, Millfields-road.
 W. Shurmar & Son, Ltd. £215 0 0
 W. Silk & Son 198 0 0
 H. Bouneau 193 0 0
 McCormick & Sons 172 0 0

Linehouse, Northey-street.
 H. Bouneau £171 12 0
 A. E. Symes 160 0 0
 A. J. Sheffield 159 0 0
 G. Barker 143 0 0

Peckham, "Peckham Park."
 W. Hooper £281 0 0
 J. F. Ford 238 0 0
 W. Sayer & Son 220 0 0
 H. C. Crooks 220 0 0

Holborn, Princes-street.
 G. S. S. Williams & Sons £209 0 0
 F. Bull 193 0 0
 H. Bouneau 170 0 0

South S. Pancras, Prospect-terrace.
 F. T. Chidley & Co. £168 0 0
 H. Bouneau 163 0 0

Hampstead, Rosslyn Hill.
 Marchant & Hirst £20 0 0
 T. Cruxys 35 0 0

Peckham, Ruby-street.
 Lathley Bros. £207 0 0
 W. Banks 206 17 6
 J. Appleby & Sons 205 0 0
 W. Sayer & Son 204 0 0

Bow and Bromley, Smead-road.
 W. Silk & Son £256 10 0
 Stevens Bros. 248 15 0
 H. Bouneau 236 0 0
 G. Barker 225 0 0
 Woolleston 185 0 0

East St. Pancras, "Stanley" (Old and New Portions and L., but not including J. G. School).
 T. Cruxys £431 0 0
 G. Kirby 254 0 0
 Stevens Bros. 224 10 0
 Hirst 219 0 0

West Marylebone, Stephen-street (Old and New Port).
 W. Hornett £232 0 0
 S. Polden 210 0 0
 F. T. Chidley & Co. 192 0 0

Walworth, Surrey-square.
 J. F. Ford £212 13 6
 E. P. Bulled & Co. 209 0 0
 J. Appleby & Sons 201 0 0

Stepney, Trafalgar-square.
 H. Bouneau £275 12 0
 J. Haydon & Son 229 10 0
 G. Barker 206 10 0
 Barrett & Power 200 0 0

Woolwich, Union-street (Omitting Office).
 W. Banks £24 10 0
 W. Sayer & Son 226 0 0

South-west Bethnal Green, Virginia-road.
 J. Grover & Son £383 10 0
 W. Silk & Son 366 10 0
 H. Bouneau 279 0 0

West Southwark, West-square.
 E. P. Bulled & Co. £293 0 0
 W. Hornett 217 0 0
 J. Greenwood, Ltd. 180 0 0
 J. F. Ford 180 0 0

Battersea, Highgate-road.
 E. Flood £351 0 0
 E. P. Bulled & Co. 245 0 0
 R. A. Jewell 233 0 0
 J. & M. Patrick 193 0 0

Hampstead, Fleet-road School (Painting).
 Holloway Bros. £1,142 0 0
 G. Neal 820 0 0
 Stevens Bros. 796 0 0

Peckham, Leydale-road (Painting).
 C. G. Jones £1,154 0 0

Central Hackney, Tottenham-road (Painting & Partitions, etc.).
 F. Gough & Co. £1,068 0 0
 W. Shurmar & Sons, Ltd. 1,069 0 0
 F. & F. J. Wood 1,068 0 0
 A. J. Sheffield 1,050 0 0
 H. Bouneau 1,042 0 0

For Erection of Cycle Sheds at Various Schools.

Table with columns for various streets (Priory-grove, St. Andrew's-street, Earlsfield, Merton-road, Grovestreet, Baring-road, Edinburg-road, Aristide-road, Langford-road, Northwood-road, Portman-place, Total) and rows for contractors like Harrow, South Bermondsey Station, S.E., McManus, etc.

For Supply of Baths for Schoolkeepers' Houses.

Table with columns for bath sizes (5 ft., 5 ft. 6 in., 4 ft. 6 in.) and rows for contractors like A. Harris, 56, Blackfriars-road, S.E., etc.

For Providing Small Corrugated Iron Sheds for Storing Chairs, Gymnastic Apparatus, etc.

Table with columns for various roads (Dalmuir-road, Old Woolwich-road, Station-road, Deptford Park, Leo-street, Total) and rows for contractors like Harrow, South Bermondsey Station, S.E., etc.

For carrying out repairs to schools on the printed schedule of prices.

Table with columns for Greenwch and West Lambeth, and rows for contractors like J. Jerrard, 5, The Pavement, South Newwood, S.E., etc.

a is for repairs, measured work. b is for sanitary, measured work. c is for day work, generally.

Hoxton, Wenlock-road (Partitions, etc.).

Table listing contractors and prices for Hoxton, Wenlock-road.

Fulham, Kingwood-road School (Partitions, etc.).

Table listing contractors and prices for Fulham, Kingwood-road School.

Chelsea, Cook's-ground (Partitions).

Table listing contractors and prices for Chelsea, Cook's-ground.

Fulham, Townmead-road (Heating Apparatus).

Table listing contractors and prices for Fulham, Townmead-road.

Wandsworth, Salter's-hill (Heating Apparatus in Connection with Enlargement).

Table listing contractors and prices for Wandsworth, Salter's-hill.

Wandsworth, the "Southfields" School (Heating Apparatus).

Table listing contractors and prices for Wandsworth, the "Southfields" School.

Woolwich, Wood-street Improvements (Heating Apparatus).

Table listing contractors and prices for Woolwich, Wood-street.

Clapham, Bonnevill-road Zen School (Heating Apparatus).

Table listing contractors and prices for Clapham, Bonnevill-road Zen School.

Fulham, Lillie-road (Providing Additional Heating Apparatus and New Boiler).

Table listing contractors and prices for Fulham, Lillie-road.

LONDON.—For decorative repairs at Infirmary, East Dulwich-grove, S.E., for the Southwark Guardians.

LONDON.—For the erection of a shop at the corner of Clonmore-street and Brookwood-parade, Wandsworth, for the Lands Development Syndicate.

LONDON.—For supply of not exceeding 190,000 8-in. creosoted yellow deal blocks, for the Paddington Borough Council.

LONDON.—For cleaning and painting blocks of model dwellings in Britannia and Provost streets, etc., for the Shoreditch Borough Council.

LONDON.—For the construction of sewers at Greyhound-lane, Streatham, for the Wandsworth Borough Council.

LONDON.—For alterations at the Infirmary, Ebrook-street, Kennington-road, S.E., for Lambeth Board of Guardians.

LONDON.—For alterations at the Infirmary, Ebrook-street, Kennington-road, S.E., for Lambeth Board of Guardians.

LONDON.—For alterations at the Infirmary, Ebrook-street, Kennington-road, S.E., for Lambeth Board of Guardians.

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LONDON.—For alterations at the Infirmary, Ebrook-street, Kennington-road, S.E., for Lambeth Board of Guardians.

LONDON.—For alterations at the Infirmary, Ebrook-street, Kennington-road, S.E., for Lambeth Board of Guardians.

TENDERS.—Continued on page 141.

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Cast-iron Street Name Plates for Twelve Months	Leeds Highways Committee	City Highways Office, Whitehall-road, Leeds	July 30
Painting, etc., Museum, etc., Peel Park	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	Aug. 2
Painting, etc., Pendleton Branch Library	do.	do.	do.
Painting, etc., Albert Park Branch Library	do.	do.	do.
Painting, etc., Ilrums-o'-th'-Height Library	do.	do.	do.
Paving, etc., Streets	do.	do.	do.
Street Works	Withington U.D.C.	A. H. Mountain, Surveyor, Town Hall, West Didsbury	do.
Exterior Painting, Brighton Workhouse	Brighton Guardians	B. Burfield, Clerk, Parochial Offices, Prince's-street, Brighton	do.
Widening Blackford-road	Ivybridge U.D.C.	W. R. Parker, Surveyor, Ivybridge	do.
Constructing Footpath	do.	S. Alsou, Education Office, Workhouse	do.
Painting Swallow-nest Schools	New Riding County Council	N. Greenfields, Borough Surveyor, Town Hall, Bedford	do.
Alteration to House at Irrigation Farm	Bedford Corporation	J. Llewellyn, Smith, & Davies, Architects, Aberdare	July 30
Alterations, etc., Heolyfelin Baptist Chapel, Treveynon	do.	J. Akeley, Architect, 89, Wilton-lane, Mashborough	Aug. 1
Dwelling-house, Mashborough	do.	G. Winter, Borough Surveyor, Town Hall, Darlington	do.
Enclosing Verandah Front of Emergency Block	Tiverton Joint Hospital Board	Town Hall, Wicklow	Aug. 2
Storage Reservoir and Two Filter Beds, Tees Cottage	Darlington Corporation	do.	do.
Foundations, etc., New Technical School, The Mall, 65 vds. of 6-in. Pipe Sewer	Wicklow U.D.C.	do.	do.
Bridge and Road Improvements, Cwn Celyn	do.	W. J. Davies, Surveyor, Blaenau, Mon.	do.
Street Works, Pavilion-terrace, etc.	Nantyglo and Blaina U.D.C.	J. Price, City Engineer, Council House, Birmingham	Aug. 3
Wool Warehouse, Thomas-street, Denton Holme	Birmingham Public Works Com.	Johnstone Bros., Architects, 39, Lower-street, Carlisle	do.
Cleansing Ashpits	J. Atkinson	Sanitary Inspector, Council-chambers, Gosforth	do.
Alterations on Tollcross House	Gosforth U.D.C.	City Engineer, City-chambers, Glasgow	do.
Twenty-five Cottages at Ferryhill	Glasgow Corporation	W. Bell, Architect, Central Station, Newcastle-on-Tyne	do.
Scavenging	North-Eastern Railway Co.	Sanitary Inspector, Council Chambers, Gosforth	do.
Alterations to Brass Foundry, Swingate, Leeds	Gosforth U.D.C.	T. Winn & Sons, Architects, 92, Albion-street, Leeds	Aug. 4
Infectious Diseases Hospital	S. Dixon & Sons	J. Wiffet, Architect, Elgin	do.
Repairs, etc., Knocknagade Park Church	Northwich, etc., Hospital Committee	237, Gresham House, Old Broad-street, London, E.C.	do.
Eighty-three Tons of Galvanized Strand Wire	Bengal and North-Western Ry. Co.	do.	do.
Twenty Tons of Red and White Lead	do.	City Engineer's Office, Municipal-buildings, Leeds	do.
Paving and Flagging Streets	Leeds Highways Committee	R. Watson, Engineer, Gasworks, Doncaster	do.
Coal Store, with Iron Roof, at Gasworks	Doncaster Gas Committee	W. Scholefield, Jun., Clerk, Wellington-road, Dewsbury	do.
Broken Granite	Southill Nether U.D.C.	E. Gledhill, Clerk, Slaithe-walls	Aug. 5
350 Tons of Penmaenmawr Granite	Slaithwaite U.D.C.	J. Kenshole, Architect, Station-road, Barrow	do.
Dwelling House at New Redegar	Mr. J. Ler	Works Depart., Admiralty Office, 21, Northumberland-avenue, W.C.	do.
Painting Workhouse Infirmary	Derby Guardians	F. C. Conthurst, Architect, 4, Albert-street, Derby	Aug. 6
Movable Waterworks	Kelso District Committee	D. W. B. Tait, District Clerk, Kelso	do.
Painting, etc., Top Warrs of Workio, Infirm. Hull	Kele District Guardians	T. Beecroft Atkinson, Architect, 11, Trinity House, Hull	do.
Painting, etc., Koller Offices, Beeson-street, Hull	do.	do.	do.
Timber for Three Bridges, etc., New Fongue End Bridge	Bourne U.D.C.	F. G. Shillock, Surveyor, Bourne, Lincs.	do.
House, Shop, and Stable, Bailey-street, Deri	do.	J. Llewellyn Smith & Davies, Architects, Aberdare	do.
Thirty-five Houses at Deri	Deri No. 1 Building Club	F. Massie, A.M.Inst.C.E., Tetley House, Wakefield	do.
Sinking Four Artesian Wells	Alford U.D.C.	Borough Surveyor's Office, Town Hall, Dewsbury	Aug. 8
Street Paving, Dewsbury	Dewsbury Corporation	W. H. Mills, Engineer, Audens-street Terminal, Dublin	do.
Goods Offices, Navan Station	G.N. Ry. Co. (Ireland)	do.	do.
Goods Offices, Kells Station	do.	F. H. Bancroft, A.M.Inst.C.E., 88, Mosley-street, Manchester	do.
420 lineal yds. of Pipe Sewers, etc.	Northwich U.D.C.	A. O. Evans, Architect, Pontypridd	do.
Residence, Trellaw	Mr. W. P. Nicholas	do.	do.
Ten Cottages, Trellaw	do.	W. Skvyn, Dyvedon House, Yvornor	do.
Renovating Parish Church, Yvornor	Rev. J. Davies	School-house, Pontsteeil, Yvornor	do.
Alterations, etc., to National Schools, Yvornor	do.	F. W. D. Mitchell, 23, Rutland-square, Dublin	do.
Stages and other Buildings on Pier at Kilronan, Aran	Congested Districts Bd. for Ireland	A. Tod Brown, C.E., Estate Office, Fowlshers	do.
Public Institute and Hall, Fochabers	do.	T. Houston, Architect, Kingscourt, Wellington-place, Belfast	do.
Renovation of Manse at Carryduff, Co. Down	do.	Landsdowne & Griggs, Architects, Newport	do.
Classroom, Camfruder Board School	Trevethin School Board	J. R. Rhoad, Architect, 67, Hope-street, Glasgow	do.
Electric Light Installation, etc., Govanhill Library	Glasgow Corporation	The Corporation	do.
Painting Exchange Buildings, Nottingham	The Corporation	City Architect's Office, Guildhall, Nottingham	do.
Painting, etc., Ironwork of Trent Bridge	Nottingham Estates Committee	do.	do.
Lavatory and Sanitary Blocks, Leeds Workhouse	do.	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Road Material	Herne Bay U.D.C.	F. W. J. Palmer, Surveyor, Council Offices, Herne Bay	do.
Coal Bunker at Tottelham-lane Electric Lighting Stn.	Borough of Horsey	Borough Engineer, Southwood-lane, Highgate, N.	do.
Paving High-street, Horsey, and Turnpike-lane-hill	do.	J. T. Parker, Clerk, 23, Church-street, Wellingtonborough	Aug. 9
1,040 tons of 2½-in. Granite	Wellington U.D.C.	do.	do.
150 tons of 4-in. Granite Chippings	do.	E. Woodhouse, Architect, 88, Mosley-street, Manchester	do.
School, Cavendish-road, West Didsbury	Withington U.D.C. Education Com.	R. H. Chart, Surveyor, Union Bank-chambers, Croydon	do.
Redecoration, Repairs, etc., at Hospital, N. Cheam	do.	Small Pox Hosp. Bd.	do.
Rebuilding Parsonage (Hundred) Bridge, Leigh	Lancaster C.C. Roads, etc., Comtee.	do.	do.
Rebuilding Trunkers (Hundred) Bridge, Creston	do.	do.	do.
Sewers, Shirehampton	Barton Regis R.D.C.	A. P. I. Cotterell, M.Inst.C.E., 25, Baldwin-street, Bristol	do.
Shops, etc., Commercial-street, Halifax	do.	Dashwood Caple, Architect, Cardiff	do.
Repairs to Factory, etc., Uxk, Mon.	Amble U.D.C.	W. Gibson, Surveyor, Amble	do.
960 vds. of Paving, Newburgh, etc., Back-lanes	King's Norton and Northfield U.D.C.	A. W. Cross, A.M.Inst.C.E., 23 & 25, Valentine-ri., King's Heath	Aug. 10
2½ Miles Pipe Sewers at California, etc.	Lambeth Guardians	J. H. H. Swinay, M.Inst.C.E., Avenue-chambers, Belfast	do.
Conv., Int's. Bk. at Norwood Schs. into Rving. Wd.	Redditch U.D.C.	B. Perrins, Surveyor, Redditch	Aug. 11
Brick Chimney at Electricity Works	do.	J. P. Mullen, Architect, at Hospital	do.
Painting Works, 8, Charlotte Infirmary, etc., Cork	Federated Malay States Ry.	do.	Aug. 12
2,112 tons of Steel Rails	do.	do.	do.
173 tons of Fish Plates	do.	do.	do.
21 tons of Fish Bolts and Nuts	do.	do.	do.
Hippodrome, Bamsden-street, Huddersfield	Northern Theatres Co.	W. Cooper, Architect, 4, Kirkgate-buildings, Huddersfield	do.
Bakery, Bangour	Edinburgh District Lunacy Board	Hippolyte J. Blanc, Architect, 25, Rutland-square, Edinburgh	do.
Medical Superintendent's House	do.	do.	do.
New Council School at Bagshot	Survey Education Committee	Jarvis & Richards, 36, Victoria-street, Westminster, S.W.	Aug. 13
Alterations and Additions to Whitechurch Union	Whitechurch (Islong) Guardians	W. Webb, Architect, Bargates, Whitechurch	do.
Two 1,000 kw. Turb. Alternators	Leeds Corporation	J. B. Hamilton, Gen. Mang. Tram., Standard-bldgs., City-sq., Leeds	do.
Single Line Colliery Branch Railway, Dalrieket	Glasgow & S.W. Railway Co.	Engineer's Offices, St. Enoch Station, Glasgow	do.
Water Supply, Portrane Auxiliary Assy., Co. Dublin	Richmond District Asylum Com.	R. H. Swinay, M.Inst.C.E., Avenue-chambers, Belfast	Aug. 14
409 lineal vds. of 18-in. Pipe Sewer, etc., Willington	Trenmouth R.D.C.	R. S. Dinning, 21, Ellison-place, Newcastle-on-Tyne	Aug. 15
Boundary Wall at Gasworks, Poulton	Walsay U.D.C.	J. H. Crowther, Engineer at Works	do.
*Add. Coastgd. Bldgs., Essex Hill, Alderney, Chan. Isl.	Admiralty	Superintending Civil Engineer, H.M. Breakwater, Portland	Aug. 1
*Add. Coast-guard Buildings at Whitelands, nr. Seaton	do.	do.	do.
Sewage Works, Lisburn	Lisburn U.D.C.	W. T. Henry, C.E., Castle-chambers, Lisburn	Aug. 2
Laying Out Land at New Holland	do.	do.	do.
Power-House Plant, Santos, Brazil	Santos Improvements Co., Ltd.	Morley & Dawham, Engineers, 22, Victoria-st., Westminster, S.W.	do.
Cold Water Supply, York City Asylum	Visiting Committee, York Corp.	City Engineer, Guildhall, York	do.
*Repairing Guardians' Offices, Tooley-street, Ed.	Berninsey Guardians	Newman & Newman, 31, Tooley-street, London Bridge, S.E.	Aug. 2
*New Sorting Office at Lark-lane, Liverpool	H.M. Office of Works	H.M. Office of Works, Storey's-gate, S.W.	Aug. 2
Tramcars	Mun. Council, George Town, Penang	Prece & Caruay, 8, Queen Anne's-gate, Westminster, S.W.	Aug. 2
*Painting, etc., Wks., S. Whf., Trinity-st., Rotherhithe	Metropolitan Asylum Board	Office of the Board, Embankment, E.C.	Aug. 2
*Drain & Sanitary Wks., Fulbourne Asyl., nr. Cambridge	Visitors, Camb., etc., Lunatic Asyl.	A. P. MacAllister, 20, St. Andrew's-street, Cambridge	Aug. 2
Wiring and Electric Lighting of Transit Sheds	Manchester Dock, etc., Co.	W. H. Hunter, M.Inst.C.E., 41, Spring-gardens, Manchester	do.
*Making-up Gordon-road	Leeds Corporation	C. P. Lovelock, U.D.C. Offices, High-street, Carshalton	do.
Colsterdale Reservoir, Healey-with-Sutton	Leeds Education Committee	City Engineer's Office, Municipal-buildings, Leeds	Sept.
*Block of Schools at Southby-road, Ponders End	do.	G. E. T. Laurence, 22, Buckingham-street, Adelphi, W.C.	Sept.
*Additns., Alma-rd. School (Girls' Dept.), Ponders End	do.	do.	do.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, Tenders to be delivered. Includes entries for railway siding, galvanised fencing, and various engineering projects.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, Applications to be in. Lists various technical and administrative roles with their respective salaries and application dates.

Those marked with an asterisk (*) are advertised in this Number. Competitions, —. Contracts, iv. vi. viii. x. Public Appointments, xvi. xvii.

TENDERS.—Continued from page 139.

Table of tenders for various projects including lighting installations, sewer works, and railway work. Lists contractor names and amounts.

Table of tenders for projects in London, including tenement houses, fire-resisting works, and cleaning services. Lists contractor names and amounts.

Table of tenders for projects in London, including crane and locomotive work, and sewer construction. Lists contractor names and amounts.

LONDON.—For the construction of Section D of the new southern outfall sewer No. 2 (southern outfall sewer enlargement), for the London County Council:—
 S. Pearson & Son, Ltd. £675,943 0 01
 J. & T. Binns 665,986 0 0
 Kirk, Knight, & Co. 537,518 0 0
 H. & J. Martin, Ltd. 525,095 19 8
 R. H. B. Neal, Ltd. 477,382 0 0
 J. D. Nowell & Sons 464,143 17 7
 W. Scott & Middleton 444,400 16 7
 J. Rowden & Co. 417,223 3 2
 W. Kennedy, Ltd. 409,805 3 8
 E. Nuttall & Co. 407,697 19 4
 J. B. Squire & Co. 375,499 4 9
 A. Kellett 361,605 11 5
 Westminster Construction Co., London* 348,416 13 71

LONDON.—For additional sanitary accommodation, Clapham tramways car-shed, for the London County Council:—
 Kirk & Randall* £350

MERTHYR TYDFIL.—For erecting an additional office at Merthyr Tydfil, Workhouse, for the Guardians. Mr. T. Roderick, architect, 50, Gledelands-street, Merthyr:—
 J. Williams £155 17 0
 M. Jenkins £138 12 1
 Ingleson & Co. 147 0 0 D. & H. Protheroe 138 8 0
 E. L. Sullivan 140 8 0 B. Lloyd 125 9 7
 J. F. Seal 139 18 7 D. O. Evans* 120 3 0
 W. Jones 139 10 0
 [All of Merthyr Tydfil.]

MITCHAM.—For erecting a twenty-two bed pavilion, and for alterations to laundry, etc., at the Isolation hospital at Beddington Corner, for the Croydon Rural District Council. Mr. R. M. Chart, E.S.L.:—
 W. Smith & Sons, Croydon £5,673

RAMPTON.—For alterations to Wesleyan Chapel, for the trustees. Messrs. Eyre & Southall, architects and surveyors:—
 H. Bayes* £152 10 0

RETFORD.—For new business premises, Carolgate, for Mr. W. Loseby. Messrs. Eyre & Southall, architects and surveyors:—
 G. Fenton £2,295 10 0
 F. Fenton £1,990 0 0
 T. Hopkinson 2,152 0 0
 C. Jones 1,970 0 0
 G. Hurst 1,991 0 0
 A. Richmond* 1,813 0 0

RETFORD.—For new conveniences at the National Schools. Messrs. Eyre & Southall, architects and surveyors:—
 T. Hopkinson £181 0 0
 C. Jones 152 0 0
 F. Fenton 167 0 0
 A. Richmond* 125 0 0

STAINES.—For roadworks, Victoria-road, for the Urban District Council. Mr. E. J. Barrett, Engineer and Surveyor, Town Hall, Staines:—
 Harvey Bros. £272 7 0
 C. Mott & Sons £202 13 2
 W. Adamson 265 0 0
 Lawrence & Cunliff 261 16 6
 Thacker, Ld., Forbess, & Co. 246 15 3
 Laverdick gardens, W. H. Wheeler 245 0 0
 Clapham, A. C. Soan 245 0 0
 Clapham, T. Watson, Junr. 237 6 11
 Common, T. Foss & Snow 215 0 0
 S.W.* 160 0 0
 Co. 203 19 4

SUTTON.—For surface water drainage and repairs to tar-paving at the Downs School, Banstead-road, Sutton, Surrey, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—
 Fry Bros. £378 0 0
 J. Wainwright Grounds & Co., Ltd. £1,061 0 0
 Newton, T. Adams 1,044 0 0
 Page Green, T. Robinson 777 17 8
 road, South T. Cole 737 0 0
 Tottenham* 312 12 0
 Gardner & Hazell 520 0 0

B. NOWELL & Co.,
 Stone Merchants & Contractors.
 Chief Office.—Wareick Road, KENSINGTON.
 Norway, Guernsey, and Leicestershire Granite, Kerb, Pitching, and Yorkshire Stone.
 ESTIMATES GIVEN FOR EVERY DESCRIPTION OF ROAD MAKING.

SUTTON.—For alterations and additions to the Belmont Asylum, Brighton-road, for the Metropolitan Asylums Board. Messrs. T. Dinwiddie & Sons, architects, 54, Parliament-street, S.W. Quantities by Messrs. B. L. Curtis & Sons, 11 and 12, Finsbury-square, E.C.1:—
 J. J. Plak £21,951 0 41
 Foster Bros. 20,730 0 0
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ILLUSTRATIONS.

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Mount Grace Priory: Original State and Additions.....	Mr. Ambrose Poynter, Architect.
1. West Elevation.	
2. East Elevation.	
Design for a Town Church	By Mr. W. J. Tapper, A.R.I.B.A.
Sketch for the Church of the Ascension, Plumstead	By C. H. M. Mileham.

Illustrations in Text.

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The Church of Chipping Ongar.



WENTY-THREE miles due north of London, on the little river Roding, is the old town of Chipping Ongar, thus called because of its ancient "chepe," or market, which probably served for the hundred that took its name from this place. This old Anglo-Saxon settlement chiefly consists of a long street with more than one picturesque bend in it. Although much has been lost in the last fifty or sixty years several of its old houses and cottages, and not a few of its trees, Chipping Ongar still lay claim to a beauty and interest of its own, though not of so high an order as might be expected from the writings of Isaac Taylor (the literary congregationalist minister of this town at the beginning of last century) and his two literary daughters.

Essex possesses several simple moated mounds, as well as mounds with base courts, the origin of which have been again debated with energy in the last few years. Of the latter of these two classes Ongar is a most striking example. The height and bulk of the great mound of Ongar Castle, the depth and width of its moat, and the solid rampart round the inner bailey unite in proving that there was here at one time a fortress of sufficient importance to dominate the immediate district. Part of the rampart and base of a second or outer bailey sweeps round for about 400 ft. on the west, to embrace, as it were, the town or settlement, though the rest of this has for the most part disappeared. There are also some traces of another, and probably later, court on the east. It is necessary to be fairly explicit as to these earthworks, for the date of the oldest part of the fabric of the present church hinges to some extent on this question. Those interested in this matter should consult the plan and description by Mr. T. Chalkley Gould in his excellent paper on the ancient earthworks of the county in the first volume of the "Victoria County History of Essex" (1903). A small piece of solidly-huilt rubble and tile masonry has been found in the rampart of the inner bailey, at a place where it is supposed that there was a communication with the outer bailey. The idea that masonry of a like character ran round the bailey rampart has been disproved, for excavations show that a chalky houlder-clay, gravel, and sand rammed together are the main constituents of the wall. There are also one or two other disjointed fragments of like rude masonry. On the whole, after careful examination, and after weighing analogous cases, the probable truth of the matter is that there was a mound here with an adjacent earthwork in pre-Norman days for an Anglo-Saxon defensive settlement of importance, which was held, just before the Conquest, by Ailida, a certain free-woman, as the centre of her broadlands. Such a view does not, however, clash with Mr. Round's belief that, when Count Eustace of Boulogne obtained his large

grants from the Conqueror, he made Ongar the "caput" of his great Essex fief; for doubtless the old defensive works would then be put in repair. The moat was probably deepened, the keep mound of a castle raised, and a new or renewed outer bailey thrown out by Richard de Luci, Chief Justice of England, in 1162, when he made Ongar into a vast fortress. Ongar was bestowed on De Luci by William Earl of Mortaigne, son of King Stephen, and the lordship then became an honour. In 1176, after the rebellion of the barons, Henry II. took into his own keeping nearly all the English castles, including, as is expressly stated, that of his intimate friend Richard de Luci. The castle was demolished in Elizabeth's reign, and the fine dwelling-house erected in its place was in its turn removed in 1744.

As to the church, which stands under the shadow of the castle mound, history is almost silent. All that Morant's folio "History of Essex" (1768) has to say of Chipping Ongar in this connexion is contained in a paragraph of extreme brevity:—"The Church, dedicated to St. Martin, is of one pace with the Chancel, tiled. A spire, leaded, contains one Bell." It is further stated that the rectory has always been appendant to the manor, and that, the value of it being hut small, the neighbouring church of Greensted was united to it, temp. Edward VI., by Act of Parliament, hut that this Act was repealed in the next reign.

Records yield a single entry of interest relative to the early story of this fabric.



Fig. 1. Built-up Doorway, North Side of Nave.

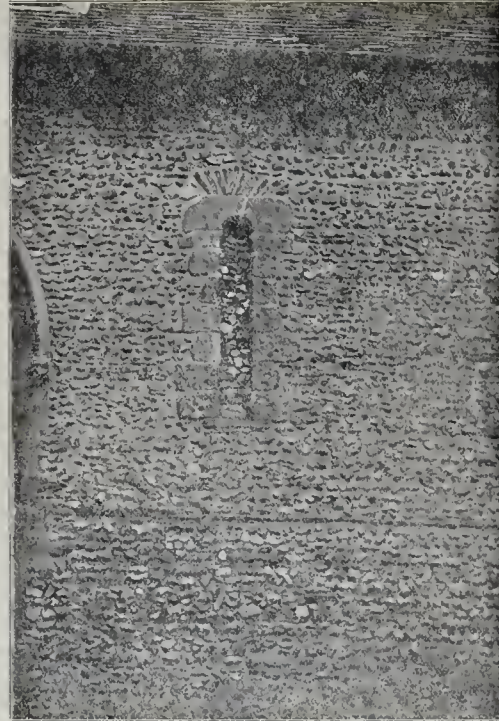


Fig. 2. Early Blocked up Window, North Side of Nave.

John, the clerk of Ongar, was ringing the church bell in 1285 when the clapper fell on him and killed him instantly. A verdict of death by misadventure was returned, and the value of the bell and clapper was assessed at 8s. 2d., or about 5% of money of the present value. According to the custom of the time the bell and bell-clapper that caused the death became dead and were forfeited to the Crown, or rather they had to be redeemed at the full value by the owner, which in this case would be the churchwardens of Ongar.

The church of St. Martin consists of chancel, nave, and south aisle, and is but of small proportions for the church of an old market town that gave its name to a Hundred. This seems to prove that the town did not expand in any material degree during mediæval days after the Norman period. The chancel is but 18 ft. long and the nave 51 ft. The south aisle was not added to the church until 1884, at which date the fabric underwent considerable repair, including the stripping of the walls of rough-cast and the insertion of a new east window in the chancel.

The building shows, however, various interesting remains of considerable antiquity. It has been assumed that, when Richard de Luci, the devoted servant of Henry II., secured Chipping Ongar, he built the church "largely of ruined Roman work." He died in the year 1179. But, at any rate, it may be maintained with confidence that the term *Chipping Ongar* betokens a market town on this site of pre-Norman date, and, further, that it is highly improbable, nay,

almost impossible, that such a town, within easy distance of London, would be destitute of a Christian church during the later Saxon period. It is only natural then to look round and see if the fabric bears any trace of Saxon workmanship.

This brings us at once to the important factor in Essex church buildings—the prevalence of brickwork. The county has some noble specimens of ecclesiastical brickwork of the latter part of the XVth and the beginning of the XVIth centuries. Such are the fine towers of Fryerning, Ingatestone, and Rochford, and the porches of Leigh and of the recently described ruined church of Chingford.

But there is a far more interesting brickwork question in connexion with Essex churches than that pertaining to its development at the close of the mediæval period. Those who have made a study of this question are well aware that the once confidently-made assertion as to the disuse of brickmaking in England from the time when the Romans left us up to the XVth century is an error. A visit to the East Riding, notably to Walton, will afford convincing proof that bricks were used in England in the XIIIth century. We are not, however, aware of anything having arisen or been discovered to substantiate in any way the idea, once propounded in an early issue of the *Essex Archaeological Society's Transactions*, that the Normans made tiles in England. There are various Essex churches wherein the flat Roman bricks or tiles are much used in what is usually termed Norman

workmanship. This use of old Roman material is certainly far more likely—unless other circumstances contradict the supposition—to have been done by the Saxons rather than the Normans. In certain well-known cases the considerable use of Roman material in pre-Norman churches is accepted by everyone—as at St. Martin's and St. Pancras', Canterbury, or at Stone-by-Faversham, Kent. In two cases these Saxon church builders undoubtedly made large use of Roman tiles in turning their arches, notably at Brixworth, Northamptonshire, and also at Britford, near Salisbury. Now at Chipping Ongar there is a large built-up doorway on the north side of the nave, the jambs and turn of which are formed of Roman tiles (Fig. 1). It should be compared with a somewhat similar built-up door or archway in the outer north wall of the fine church of Prittlewell in this county. This doorway, to anyone well acquainted with Brixworth and Britford, looks far more like pre-Norman work than the work of Richard de Luci in the middle of the XIIIth century.

Then, again, on the north side of both the nave and on both sides of the chancel are small built-up early lights with a turn of Roman tiles at the top (Fig. 2). These should be compared with somewhat similar lights to the nave of the church of Fryerning; only in this case an unhappy restoration has brought about their rebuilding on a larger scale.

Again, the quoins of this church, both of the west end of the nave and the east end of the chancel, are formed of Roman tiles, as shown in Figs. 3 and 4.



Fig. 3. Chipping Ongar Church : South-east View.

It is exceedingly unfortunate that the original character of the east end of the church has been destroyed by the insertion of a large window, but the "long-and-short" work of parts of four small lights (Fig. 3) seem to be pretty clearly of pre-Norman character. The timber work at the sides and apex of the east gable is obviously of much later date.

On the whole, we incline to the opinion that there is much more likelihood of a good deal of the oldest work of this church being late Saxon rather than Norman. At all events, this fabric deserves closer attention at the hands of capable archaeologists than it has yet received. The round-headed plain priests' door on the south side of the chancel is among the early and somewhat puzzling features.

The south side of the chancel is lighted by a graceful triple lancet, with the centre light higher than the side ones. This is in good brickwork. We believe it is possible that this is original brickwork of the XIIIth century, though the bricks are somewhat larger than others of that century. If it is of later workmanship, it is a clever reproduction of XIIIth century proportions.

At the west end of the nave is a small modern porch, which partly obscures a rebated window. Above that window, in the gable, is a plain early single light, which has now a round head; it has been altered in construction, and probably had originally a lancet head of Henry III. date.

In the north wall of the nave are three two-light pointed windows of XIVth century style; they date from 1884, but are said to succeed others of like construction.

On the north side of the chancel is a small modern vestry. On this side, too, of the chancel, behind the organ, is a three-light window in moulded brickwork, apparently of XVIIth century date. There is also a modern-looking low doorway (reconstructed, we believe, in 1884), giving access to a very small chamber in the thickness of the wall.

Inside the chancel at this point, in the north wall, may be noted a small opening, measuring 13 in. by 6½ in., which probably served as a squint from a narrow anchorite's cell.

In the interior of the chancel may also be noted a piscina niche on the south side, with a large grooved drain, of the time of Edward I. There are also remains of a

holy-water stoup by the blocked-up north door of the nave. The font is modern. The old tie-beams and king-posts of the nave remain. These and other features of the old roof are probably early XIVth century, but have been much altered. The pulpit has some handsome carving of the first half of the XVIIth century.

On each side of the nave roof are two dormer windows, which, with their wooden casings and neat blinds, have a curiously domestic look; they are probably *circa* 1800 in date.

The timber belfries of Essex are a common and characteristic feature of the churches of the county. The only other county where these are to be found in anything like the same frequency is Hampshire, and there only in certain localities and not generally distributed. Moreover, these western belfries of Essex have an advantage over those of the more southern county, as the square bell-chamber in the former county usually loses its awkwardness by being finished with a low spire. Chipping Ongar is a fair example of the simpler style of late timber work added to an existing building when the desire for more than a single bell swinging in a western cote was strong, and when lack of funds and lack of stone made tower building an exceptional luxury. Externally, in cases like Chipping Ongar, a square, plainly-built bell-chamber is to be seen, striding across, as it were, the western end of the gabled roof of the nave, and projecting some little way down its sides on



Fig. 4. Chipping Ongar Church : North-west View.

the north and south. Here, as is usually the case, it is covered with weather-boarding, which, from its often refreshed coat of light paint, looks fairly modern. The plain square belfry is surmounted by a short octagon-hroached spire, covered with diagonally-arranged lead.

But the interior of the church at once shows the age of the construction. A cleverly-arranged framework of massive oak beams rises from the floor level, "capable of sustaining the vibration of a ring of bells for three or four centuries without starting a joint." Here, as in most similar cases, there seems good reason to believe that the timber framework, with its spire-crowned bell-chamber is of the second half of the XVth century.

On the floor of the chancel, within the altar rails, concealed and perhaps preserved by a heavy covering of linoleum, is an inscribed grave cover of decided interest. It is sometimes stated that Jane, a daughter of Oliver Cromwell, the Protector, is buried here; whilst the last edition of "Kelly's Directory" of the county makes the lady the niece of the great Protector. The Latin inscription states that Jane, daughter of Oliver Cromwell, Knight of the Bath (*equitis balmiensis*), of Hinchinbrook, Huntingdon, and wife of Toby Pallavicini, Esquire, was buried here on March 24, 1637, aged 42. Sir Oliver was knighted by Queen Elizabeth in 1598; at his great house at Hinchinbrook he several times entertained James I., and probably also Charles I. He married firstly Elizabeth, daughter of Thomas Bromley, Lord Chancellor; and secondly Ann, widow of Sir Horatio Pallavicini. Robert Cromwell, a younger brother of Sir Oliver, settled at Huntingdon, and was father of Oliver, the Protector, who received his name from his uncle and godfather at his baptism in 1599. It thus follows that Jane of the Chipping Ongar monument, instead of being the daughter or the niece of the great Oliver Cromwell was simply one of his first cousins.

Sir Oliver Cromwell had four sons and four daughters by his first wife, of whom Jane was one. By his second wife, the widow of Sir Horatio Pallavicini (a Genoese and great favourite of Queen Elizabeth), Sir Oliver had three other children. Sir Horatio left two sons, Henry and Toby, and they were married when mere children in All Saints, Huntingdon, on April 24, 1606, Toby being several weeks short of thirteen years of age. Their child-wives were their stepsisters Katharine and Jane Cromwell. Jane, Toby's wife, was but eleven years of age at the time of their marriage. Both Henry and Toby Pallavicini were subsequently knighted. The issue of the marriage of Toby and Jane was three sons and a daughter. Horatio, the eldest, born in 1611, is buried by his mother. The floor stone is inscribed:—"Here lieth the body of that truly noble and religious gentleman Horacio Pallavicini, Esquire, who departed this life on the ninth day of May in the year of our Lord God 1648, being of the age of six and thirty years."

Against the south wall of the chancel is a mural tablet of white marble to the memory of "Mrs. Sarah Mitford (the

deservedly beloved wife of John Mitford, some time of this parish Esquire), who departed this life December 8, 1776, aged 31 years." It is perhaps as well to mention this monument in order to disperse a fond, quaint tale pertaining to its heraldry, which has not a few believers in the town of Ongar. On the occasion of one of our visits our attention was particularly directed to this monument by a worthy tradesman, who said that many persons came to the church expressly to see it. The arms above the tablet were described by him as bearing the fourfold cognisance of "a flea, a fly, a louse, and a comb," with a singular legend as to their origin! As the arms are now uncoloured and high up, they are somewhat difficult to decipher; but they proved to be a fesse between three moles (Mitford) impaling a chevron between three combs (Botell)!

NOTES.

Dangerous Highways. THREE points of much importance to the general public are now under consideration by the Board of Trade, having been brought to the notice of the department by a deputation from the Roads Improvement Association. The first relates to the erection of posts in the middle of carriage-ways for tramway purposes, a very unnecessary arrangement, which encourages drivers of light vehicles to race for the purpose of getting between heavy vehicles and the posts. This dangerous practice, we may observe, is also caused by the electric light posts which have been so unwisely placed in many streets of the metropolis. The second point arises out of tramway construction in roads which are so narrow as to leave insufficient space for the passage of ordinary traffic. Colonel Crompton properly expressed the hope that the Board of Trade would not sanction any lines unless the minimum widths of 33 ft. for double track and 27 ft. for single track were assured. These measurements are the minima recommended by the departmental committee on the subject of highway administration, and are none too ample for the safety and convenience of the public. As a third point, Mr. Rees Jeffreys urged that main roads should be uniformly paved for the entire width where tram lines are laid. This is clearly desirable, although perhaps of less importance than the other matters mentioned.

Flood Prevention in the Thames Valley. At the present period of the year attention may well be directed to measures intended to minimise the floods that will surely devastate portions of the Thames Valley in a few months' time. The Oxford City Council has recently been able to form the opinion that, in addition to the general inadequacy of the river to carry the required quantity of water in times of heavy rain, there are other causes which aggravate the trouble. For instance, figures furnished by the Thames Conservancy make clear the fact that the Godstow weir alone is able to deliver into the Oxford area far more water than can pass at Iffley and the weirs. Hence, with water coming from

Wolvercote and the Cherwell, every considerable rise in the rivers must inevitably cause a flood. By the provision of additional weir space at Iffley and the weirs bringing the collective discharge up to the quantity of water received from above, many of the floods now suffered at Oxford could be prevented, and others perceptibly diminished, if not entirely avoided. The present is clearly the time for the execution of such works, and we hope the Oxford City Council will not relax their efforts until this desirable object is attained. Very little practical interest seems to be taken in the matter by other public bodies along the Thames Valley, and it is surely time for the appointment of a Commission to inquire into the whole subject and to formulate a comprehensive scheme for dealing effectively with flood waters.

New Building By-laws, Hastings. THERE can be little doubt that building regulations ought to be revised from

time to time, and the example of the Hastings Town Council is one which may be commended to other authorities. Old regulations may prove to be either inadequate or unduly restrictive; in the former case narrow and inconvenient streets may be constructed and insanitary or unstable buildings may be erected, while, in the latter case, the cost of building may be unduly increased or, certain materials being prohibited, there may be little scope for variety in architectural treatment. The new Hastings by-laws repeal certain clauses in the by-laws of 1882 and 1894 and substitute others dealing with the width of streets, the construction of walls, floors, and roofs, and the drainage of buildings. The rules for hollow walls are as moderate as possible, and, under certain conditions, half-timber work and tile-hung timber framing may be used for external walls. The scantlings of timbers for floors, roofs, etc., are carefully specified, but provision is made for variation; thus, while the scantlings of floor-joists for different spans are given in detail, the depth and breadth may be varied, or other sizes may be adopted, and the spacing of the joists be increased or diminished, provided that the same strength of floor is obtained. The rule which provides that the sizes "apply only to . . . any species of fir or pine of sound and good quality" is open to criticism, as it places pitch-pine and white deal or spruce on the same footing, whereas the transverse strength of the former is at least 50 per cent. more than that of the latter and is equal if not superior to that of oak.

Technical Instruction in Germany. IN a report published in July by the Foreign Office, Dr. Frederic Rose, British Consul at Stuttgart, gives full details of special technical schools for the ceramic industries in Germany. We have nothing like them in this country, notwithstanding the progress made in technical education. At the present time there are four schools of the kind in Germany, all situated in the midst of the industries they are intended to promote. Their object is to afford thorough theoretical and practical instruction, and to qualify students for future positions

as owners, managers, foremen, and artists in various branches of the industries concerned. For details of the organisation, methods and courses of study of these schools we must refer our readers to Dr. Rose's excellent report. We may remark, however, that in the school at Lauban, devoted exclusively to the interests of brick-making and allied industries, the curriculum includes such subjects as mathematics, physics, chemistry, mineralogy, electro-technics, drawing, book-keeping, industrial legislation, and other more or less useful theoretical studies, as well as practical tuition as to the properties of raw materials and the most efficient methods of using them in manufacture. It will be seen, then, how thorough is the instruction available. A noteworthy point is that the authorities, and not the manufacturers, first recognised the need for the schools mentioned, a tendency which is frequently observable in the case of minor industries in Germany and elsewhere.

CONCURRENTLY with the efforts still being made for the complete development of Egypt proper, the Government is now actively engaged in the prosecution of works and measures for the regeneration of the Sudan. An expert Commission, appointed to decide between Sheikh Barghoot and Suakin as a port and the terminus of the railway to be constructed from Berber to the Red Sea, has practically arrived at a decision in favour of the former place, which offers excellent anchorage, and has an abundant supply of fresh water. Whichever of the two sites may be finally selected, it is certain that the new port will be of considerable importance, and will serve in a marked degree to hasten the prosperity of the country for whose products it will be the natural outlet. In view of the construction of the railway the Government is taking active measures for the sale of lands within easy reach of the new line. Those who undertake the work of development will be required to lay out the land for basin irrigation, and in such a way as not to interfere with any larger schemes of irrigation as may ultimately be adopted in the neighbourhood. All irrigation drainage and kindred works must be constructed in accordance with plans to be approved by the Public Works Department. Winter pumping for watering crops after the flood has subsided will be permitted so long as no interference is caused to the supplies required for Egypt and the remainder of the Sudan; but, unfortunately, no summer supplies can be guaranteed. This serious drawback will doubtless be removed in due course by the construction of reservoirs on the upper reaches of the Nile.

New Names for Old Streets: Stepney Borough. THE Borough Council are formulating a scheme for re-naming certain streets which will contribute to preserve the memory of some historical personages associated with Stepney parish and the vicinity. Whilst the preliminary researches are not yet concluded we gather that the Council are thus far minded to adopt the following changes of nomenclature: Morgan-street, Com-

mercial-road, St. George's-in-the-East, will under its new style of Hessel-street, commemorate the martial exploits of Phœbe Hessel, who was born in Stepney parish in the year 1713, and died at Brighton on December 12, 1821. She enlisted in the Fifth Foot, now the Northumberland Fusiliers, and was wounded at Fontenoy—as is recorded in her epitaph, transcribed in Brayley's "Topographical Sketches of Brighthelmston." Hugh de Fulbourne, rector of Whitechapel in the earlier half of the XIVth century, will give his name to Thomas-street, Whitechapel-road; Thomas-street, Limehouse, is to be called after Lake, a resident, who served as Secretary of State to King James I.; whilst the memory of an earlier inhabitant of Stepney, *temp.* Edward I., one de Waley, will be revived by the calling of Mary-street, Whitechapel, after him, and York-road, Commercial-road East, under its new style of Haddock-road, will remind us of Sir Henry Haddock, a local celebrity in pristine times. The project we describe moves in the right direction, and is one of many indications that the shade of Bumble which brooded over the vestries and local authorities is gradually being dissipated from our midst. It has, moreover, the merit of practical utility, inasmuch as it tends to reduce the re-duplication of street-names in London—a source of frequent error and confusion.

Sir Francis Chantrey's House in Pimlico. THE block of shops and residential flats to be erected after Messrs. Read and MacDonald's plans and designs will stand on the site of three or four houses each of which is worthy of a passing notice as associated with the careers of Chantrey and his assistants. The ground lies at the corner, north-east, of Buckingham Palace-road and Eccleston-street. Of the houses that have been pulled down, one was occupied by Chantrey from 1814 until his death in 1841. The house was originally Nos. 29 and 30, Lower Belgrave-place, which Chantrey converted into one, and he added a studio, a sculpture gallery, and a foundry for working in bronze. There he carved the busts of Roscoe and Canning, in Liverpool Town Hall; Sir Joseph Banks, in the National Collection; James Watt, at Glasgow; Lady Louisa Russell, at Woburn, and Sir Walter Scott; the statues of Pitt, in Hanover-square; James Watt, in Westminster Abbey; George IV., in Trafalgar-square; and the Duke of Wellington (finished by Weekes), Royal Exchange. In 1831 Soane built the ante-room, lighted by a lantern in the roof, of the sculpture gallery. The house was renumbered as No. 1, Eccleston-street, and again as No. 102, Buckingham Palace-road. Another of the houses, formerly No. 27, Lower Belgrave-place, but latterly No. 98, Buckingham Palace-road, was the home of Allan Cunningham, the poet, whom Chantrey employed during nearly thirty years as his secretary and foreman mason, and to whom he bequeathed 2,000*l.* and an annuity of 100*l.* In the adjoining house lived Henry Weekes, R.A., when Chantrey's principal assistant. After his master's death Weekes completed some of the former's commissioned

works, and removed to Chantrey's house, where he remained until his death in 1877. At No. 98 was born, in 1816, Peter Cunningham, a son of Allan Cunningham, who, on leaving Christ Hospital School, became a clerk in the Audit Office, and compiled the "Handbook of London" (1849-50). No. 13, Eccleston-street, whither Chantrey removed from No. 12, Charles-street, St. James's-square, on his marriage in 1807, has been pulled down.

EXHIBITION OF STUDENTS' WORKS AT SOUTH KENSINGTON.

TWO VERY instructive exhibitions, indicating the standard attained in the official art education of the nation at the present time, are to be seen at South Kensington, and will be open during the month of August.

The national art competitions are located in the Indian section of the Victoria and Albert Museum, and consist of an excellent selection, from important art centres, of works comprising designs in architecture, studies of old buildings, examples of textile fabrics, metal work, faience, enamels, wallpapers, modelling of figures, and designs for posters. In the architectural section a bronze medal is awarded Mr. J. H. Gibbons for some good measured drawings, and the same author obtains a silver medal for drawings of a large painted rood screen, a good design in many respects and well shown in a practical, detailed way. Mr. A. R. Atkinson sends his design for the treatment of a crescent in the streets of a large town, which was submitted at the R.I.B.A. exhibition in January last and received our favourable comment; the author is awarded a bronze medal for this work and a silver medal for a clever design for a covered bridge, a Gothic feature spanning a small river. The effects are perhaps hard and rigid, but the drawings are excellent. Mr. A. R. Richardsou gains a similar award for his design for a "Pavilion in a Public Park." A good design is "A Town Bank," by Mr. S. F. Parsons, which wins a bronze medal. Excellent work is shown in the time studies or examination in design, and the subject, a village club, is admirably treated by several students. The works in the applied arts are numerous and of considerable merit, but space does not permit of detailed reference.

The larger and perhaps more important exhibition, that of the works of students at the Royal College of Art, is to be found in an iron building known as "Block C," situated behind the Natural History Museum. The exhibits are selected from the studies made in the Architectural School, the Design School, the Craft Classes, and the Painting School. It is noticeable that a good training is given to students in architecture, under Professor Beresford Pite, by the thorough manner in which the subjects are worked out. The study of old buildings from actual example forms an important part of the instruction, for we find some scale drawings and great sheets of full-size details of the Mausoleum at Halicarnassos, which represent the work of a group of students to whom special facilities were given by the British Museum authorities. Another subject, an English Renaissance building, the Church of All Hallows, Lombard-street, E.C., now threatened with demolition, has been carefully measured. In this case the students specialising in architecture made the scale drawings of the fabric, while others following applied design have prepared full-size studies of the various carved fittings and other ornaments. Large sheets of mouldings show that Gothic architecture is practically studied in diagram and from actual example.

Coming to designs, the first year students' work cannot be said to rise above average merit. Subjects are set, based upon lectures given on the various styles of architecture. Upon the classic lectures is based the design for a colonnade, in which the student was directed to show the picturesque treatment of repeating symmetrical forms, and much good work in general ideas is to be seen.

Lectures on domed buildings formed the basis of the design for a small domed church in a British colony. Here scale drawings only are given, and the plans do not show any great imagination. In both subjects, however, Mr. E. Healey's work is of considerable merit.

A vaulted country church arises out of the mediæval lectures. In this case a plan was

given, and we should imagine that the heights were fixed; but no design has any country feeling in it, and only one student shows any knowledge of stone vaulting—scarcely a first year subject.

In domestic design, where we should have expected the most promising work, the standard falls considerably. In all cases plans are supplied, but permission is given to vary the arrangement; this, therefore, resolves the design into a problem in elevations, and, to a large extent, eliminates the difficulties of construction. It, moreover, tends to deaden the student's powers of imagination. The results of this process are borne upon the face of the actual work exhibited, for, with slight exception, there is little merit in the designs for a cottage, a country house, a small school, and an almshouse college. The best work is, perhaps, to be found in the designs for a fountain, some of which are excellently drawn to full size. In this subject it is seen that the students receive preliminary art training before entering the Royal College, for the drawing of sculpture and other embellishments is much in advance of that of the architecture.

The work of the second and third year students, while showing greater departure from type, does not mark, generally speaking, any great advance in design. The drawings of a town house are dull, and those of a domed church disappointing. The best work is seen, however, in the decorative treatment of an entrance-hall, staircase, etc., of a mansion. Some of these schemes have well-drawn designs in colour decoration, while others are limited to panelled and other wood fittings only. The work of Messrs. A. E. Martin, George, and H. Morley is excellent. The last-named, as travelling student, exhibits colour sketches and studies made during an Italian tour.

The work of the Design School is seen in a very comprehensive show, the subjects of which are too numerous for reference in this short review. Enough is seen, however, to demonstrate that the school is doing good work in the applied arts under Professor Lethaby.

The most attractive part of the exhibition is the work of the Painting School students, which bears an unmistakable influence of the master, Professor Moira, who directs the studies. Apart from the life subjects there are many decorative works of a very high order. The series of colour treatments of lunettes has produced very interesting designs, the subjects of which are supposed to represent some historical incident from the student's own district. Mr. W. G. Murray's arrangement of the semi-circle is the best in our opinion; the grouping and massing of the colour and the interests, is both satisfying and clever.

The decoration of an intersecting barrel vault, presumably, of a church, is the subject which possesses the greatest merit of the exhibition. The various schemes consist of small-scale coloured models of the vault and full-size cartoons of the chief figures, and it is interesting to note that a large proportion of lady students are represented in the excellent work exhibited; amongst whom Miss Browning, Miss Girard and Miss Pickavance are prominent. The work of the modelling class, under Professor Lantier, which contains gallery and decorative pieces and sculpture, is not the least interesting of a very interesting exhibition, which we can recommend to all our readers as worthy of a visit.

These works illustrate the systems and processes in operation for the study and application of architecture and the allied arts by British students, and the results may be said to be satisfactory, judged from the standpoint of the encouragement of individuality in design.

Other institutions that deal with architectural education—with the exception, we suppose, of the new day school of the Architectural Association—are handicapped by the very slight hold they have over the students working at their classes or for their examinations. Here we have the result of three years' systematised study. A student entering the school is trained immediately to make measured drawings and to think of them as practical working drawings such as a modern workman would require so as to reproduce the subject. A beginning is made with wooden panelling and ornament from English specimens in the Museum, taking examples in historical sequence, and observing the introduction of mitring and moldings upon the framings and the alteration of character in the ornamental forms derived from those employed in other materials, as the arced and shafts

of stonework, when used in woodwork, and so on to larger and more difficult subjects in the museum.

The study of design is enlivened by courses of lectures to each class of students, showing historical illustrations with demonstrations, as well as by visits to buildings of interest, suitable to illustrate the lecture and the subject for design. During their visits the students are instructed in making notes and sketches. Architectural perspective and pen-and-ink drawing are taught and encouraged. A student at the end of a three years' course of study has come into contact with architecture ancient and modern, and has heard discerning criticism and reference to modern requirements and methods of work. He has had a chance of learning to draw intelligently, both for his own pleasure and that he may be able to express his ideas and wishes to a workman on paper. The running accompaniment of lectures and demonstrations have taught him history and the elements of design, so that at the end of a course he is fitted to begin to learn the practice of architecture. How does this compare with the usual form of pupilage in an architect's office? There are shining exceptions, but too often, at the end of three years' pupilage, a young man is practically useless, and is without a foundation on which to place his subsequent enquiries and experience. The day school system has its disadvantages; some of them could be counterbalanced, if it were possible, by so many months' apprenticeship to competent clerks of works on big buildings in the course of erection.

Architectural pupils also have the advantage of excellent tuition in the allied crafts already referred to, a knowledge of which is essential to an architect in practice.

LETTER FROM PARIS.

The Académie des Beaux-Arts has awarded the "Grand Prix de Rome" in sculpture to M. Larrivé, a pupil of M. Barrias. This young sculptor, who obtained a medal of the third class in 1901, exhibited at this year's Salon a bronze group under the title "A la Carrière." The "second grand prix" in sculpture went also to a pupil of M. Barrias, M. Aimé Blaise. In painting, the "grand prix" has not been awarded this year.

While the "Vieux Paris" Committee is working with praiseworthy zeal to preserve the historical remains of the earlier city, certain practically-minded spirits are endeavouring equally to reconcile the modern requirements and future aspirations of the city with respect for its old associations. Hence the formation of the "Nouveau Paris" Committee, which has found even in the ranks of the Municipal Council supporters who are determined to follow out what is called the "transformation rationnelle" of Paris, professing at the same time every regard for matters of historical interest. An independent worker in the same direction is M. Eugène Hénard, who was a valued collaborator of M. Bouvard in the 1900 exhibition, and who has successively devoted himself to the solution of difficult cases in which there was a conflict between utility and sentiment. When the demolition of the fortifications was first talked of, he proposed a plan for a grand boulevard surrounding the whole city on the line of the fortifications. Later on, the question of the preservation of open spaces, so necessary for the hygienic condition of a city, led him to publish a comparison between London and Paris, in the matter of public gardens, which was to the disadvantage of the French capital. Lastly, having considered the means for utilising the Champ de Mars and the Galerie des Machines, M. Hénard has taken up the question of the Palais Royal, a quarter which is losing its old attractions for want of direct communication with the rich and populous quarters of the city. This scheme, which he calls the "nouvelle grande croisée de Paris," is to provide a new central avenue of communication, traversing the Palais Royal but without interfering with its architecture, and leading into the Rue Royale at one end and the Rue Sébastopol at the other end. This avenue, which he proposes to call the "Avenue de Palais Royale," would be intersected at a right angle by an "Avenue de Richelieu" formed by widening the old Rue de Richelieu. M. Hénard, who has studied the scheme very completely, estimates its total cost at about 35 million francs; a large expenditure no doubt, but one which it is considered would be justified by the great advantages to the centre of Paris that

would accrue from the opening up of old quarters which would have a new life infused into them; and the prevalent opinion is that historical considerations ought not to stand in the way of so great a public improvement.

The following is the scheme definitely adopted by the Municipal Council for re-arrangement of the Champ de Mars. At each side, along the Avenue Suffren and the Avenue La Bourdonnais, a space 40 mètres wide will be reserved for a first line of buildings, with shops on each face. Then will come an inner boulevard 25 mètres wide. A second line of buildings 20 mètres wide will follow, but restricted to a height of 15 mètres, and without shops on the side next the Park of the Champ de Mars. The esplanade of the Champ de Mars will be cut from east to west by two broad roads on the axes of the Rue de Grenelle and the Rue St. Dominique respectively, and all the portion between the first of these roads and the river will be laid out in "Jardins Anglais," while the opposite space, down to the Ecole Militaire, will be laid out in "Jardins à la Française," with large spaces reserved as play-grounds. A free space 60 mètres wide will be reserved in front of the Ecole Militaire, so that Gabriel's fine façade will, as before, close the perspective at the end of the Champ de Mars. This scheme of course necessarily implies the demolition of the Galerie des Machines, which however may very probably be rebuilt on some other site, where it will be useful without interfering with architectural effect.

The monument to Pasteur, by Falguière, has recently been inaugurated, but it is to be regretted that it is not in scale with its site, and that in the wide space of the Place de Breteuil, of which it occupies the centre, it seems very much lost, and it will be necessary to give it some kind of border or framework of artificial plantation, in order to give it the requisite emphasis.

The "Quartier de la Cité" will shortly be the scene of some important new works. In the first place, the Pont Notre Dame, which is a danger to the river traffic, is to be pulled down and rebuilt on different lines, at an estimated cost of 1,300,000 francs. Secondly, it is proposed to demolish the Morgue, situated at a point in the Ile de la Cité where it interferes with the view of Notre Dame. The removal of this building will allow of the garden of the Archbishop's palace being prolonged to the river bank, opposite the Ile St. Louis, and thus flowers and trees will take the place of a building of gloomy associations, which could more suitably be rebuilt near the still existing building of the ancient Hôtel Dieu.

Among other contemplated improvements may be mentioned the proposed removal to a site outside the fortifications of the Army Remount Depot, which at present occupies an extensive site between the Parc de Montsouris and the Porte d'Orleans. The Municipal Council has been in negotiation with the War Department to obtain this site for the erection of artisans' dwellings, leaving the central portion as an open square for games and gymnastic exercise.

M. Georges Trugard, a decorative sculptor of great talent, has died at the age of 56. He was a member of the Société des Artistes Français and obtained a gold medal at the 1900 exhibition, and also medals at various exhibitions of the Union Centrale des Arts Décoratifs. Among his more important work may be mentioned the carved decorations of the Eden Theatre, the Théâtre des Arts at Rouen, the Municipal Theatre of Epervy, the Salle des pas Perdus of the Municipal Buildings at Rouen, and the Salle des Fêtes at the Paris Exhibition of 1900.

BRADFORD DISTRICT BATH SCHEME.—The Mayor of Bradford (Alderman David Wade) opened the new baths in Drummond road, Manningham, on the 25th ult. The buildings are situated at the junction of Drummond road and Carlisle road. In the centre is a swimming bath, varying in depth from 3 ft. 5 in. to 6 ft. 6 in., and 60 ft. long by 20 ft. broad. Separate provision of slipper and other baths for males and females is made on each side of the swimming pond, to which there is access from both wings, with arrangements for shutting off each department as required. On the male side there are three slipper baths and fifteen douche, and on the female side two slipper and eleven douche baths. Mr. Booth was the contractor. Mr. F. E. P. Edwards, the City Architect, was architect for the work.

THE ROYAL ARCHÆOLOGICAL
INSTITUTE AT BRISTOL.*

FRIDAY, July 22, was devoted to a visit to Chepstow and Tintern. The party left Bristol at 9.45 a.m., and, on arrival at Chepstow, proceeded on foot to the parish church, which was described by the Vicar, the Rev. E. J. Hensley and Mr. Harold Brakspear. It consists of the nave only, now despoiled of its aisles, of the church of the alien priory of Strigul, which was founded as a cell of the Norman Abbey of Cormeilles soon after the Conquest. The nave, which is six bays long, has arcades of plain and simple character of a date, *circa* 1100, with a low triforium of two coupled arches and a clerestory. Both the aisles and the main span seem to have been intended to have been vaulted. The central tower fell in 1701, and only the base of its north-west pier is left. With its materials an effective new tower was built in the westernmost bay. The present north transept and chancel are modern. There are good tombs with effigies to Henry Herbert, Second Earl of Worcester (*ob.* 1549), and his countess, and to Thomas and Margaret Shipman, 1620. The font is an interesting one of the XVth century, with pierced pinnacled buttresses round the stem.

Chepstow Castle.

The grand remains of Chepstow Castle were next inspected, under the guidance of Mr. W. H. St. John Hope, who pointed out its identity with the "Castellum de Estrigoulet," or Strigul, mentioned in Domesday Book as the work of William (FitzOsbern), Earl of Hereford. The castle of Earl William, Mr. Hope thought, did not include the lower or outer bailey, which was added in the XIIIth century, and the plan and configuration of the ground seemed to point to the former existence of a rocky mound on the platform now called the barbican. Mr. Hope also showed that the so-called keep was really the great hall, and he saw no reason against its being actually the work of Earl William, and, therefore, prior to 1072, when the earl was killed in Normandy. The Count de Lasteysie, while agreeing that the so-called keep was the hall, was unable to assent to the early date claimed for it, and also expressed his inability to follow the reasons for the former existence of the moated mount at the western end. After inspecting the remains of the beautiful hall, etc. in the lower ward, and the great tower known as Martin's, or Bigod's, the party adjourned for luncheon.

Tintern Abbey.

Shortly after 2 p.m., brakes being in readiness, the journey was continued to the well-known ruins of Tintern Abbey, where Mr. Harold Brakspear briefly reviewed the history of the Abbey and the salient features of its architecture and arrangements. He also gave reasons for believing that the first church was a small one with an aisleless nave like the earliest church at Waverley, a theory that had been clearly proved by the discovery only a few days before of the foundations of the south wall of the nave exactly on the line indicated by him. The Abbey buildings are now vested in the Department of Woods and Forests under the charge of Mr. Philip Baylis, Deputy Surveyor of the Forest of Dean, and special efforts are being made to preserve everything as it stands, without loss to its beauty and picturesqueness. At present a tall scaffolding envelops the great east window, the central millium of which is in a critical condition.

The party subsequently returned by special train to Bristol.

In the evening a conversazione was held in the Bristol Museum by invitation of Mr. Francis Fox, President of the Bristol and Gloucestershire Archæological Society. By kind permission of the Lord Mayor the splendid series of swords, maces, and other civic insignia, as well as the valuable plate, was exhibited, and briefly described by Mr. Hope, who called special attention to the three earliest swords as being genuine productions of the XIVth and XVth centuries.

Bath Buildings.

On Saturday, the 23rd, the party left Bristol by the 9.35 a.m. train for Bath. Here a visit was paid first to the Roman baths, where, in the unavoidable absence of Mr. F. Haverfield, the arrangements were described by Mr. Hope, who pointed out the chief differences between this very perfect example of thermal baths and

those of the ordinary type, based on a similar system to the modern Turkish bath, found at Wroxeter, Silchester, and elsewhere. The wonderful collection of carved and moulded architectural remains, which are now being admirably arranged by the authorities in the practically vacant space north of the great bath, excited considerable attention.

The Abbey church was next visited, and described by Mr. C. R. Peers, who briefly reviewed its history from the foundation, and pointed out the leading architectural features. The present church, Mr. Peers showed, was begun by Bishop Oliver King after 1495, and completed sufficiently for the services to be held in it before 1539, and occupied the site of the nave only of the Norman church that preceded it. Some of the bases of this remain under the floor, and have been exposed for examination. At the suppression of the Abbey the church and buildings were sold, but the unfinished shell of the church was subsequently given to the mayor and citizens by Edmund Coulthurst, and in 1572 begun to be repaired and completed by Mr. Peter Chapman. Much was done to finish the building by Bishop Montague, 1608-16, but the actual completion was not effected until some thirty years ago, when the nave and aisles were vaulted by Sir Gilbert Scott.

Charterhouse Remains, Hinton.

After luncheon, carriages were in readiness to convey the party to Hinton, where Mr. Hope pointed out the chief features of the remains of the Charterhouse, one of the nine English houses of this Order. This was originally founded by William Longespée, Earl of Sarum, in 1222, at Hethrop, co. Gloucester, but moved to Hinton in 1227 by his widow, the Countess Ela. The buildings are said to have been completed in 1232, but only two isolated and half-ruined blocks now remain. The one contains the chapter-house, which, as usual, had an altar, with the sacristy and treasury above, now converted into a pigeon-house. The other is a vaulted undercroft, consisting of two chambers—a larger, and a smaller with a fireplace, and perhaps served as the frater and kitchen respectively. The church, which was vaulted, adjoined the chapter-house on the north, and the great cloister, with its circuit of the cells and gardens of the monks, lay to the south. Mr. Hope pointed out that the existing remains belonged to the *domus superior*, or upper house of the monastery, which also possessed, like Witham, a *domus inferior*, or lower house, known as the frary, about half a mile off, on the banks of the Frome, for the accommodation of the lay brothers, who there lived under the superintendence of the *procurator*. Of this nothing is now left. Some remains of the gatehouse of the upper house are incorporated into the modern mansion upon the site.

From Hinton the drive was continued past the fine XVth century hostelry at Norton St. Philips to Farleigh Hungerford, where the chapel of the destroyed castle, or fortified manor-house, was inspected under the direction of Mr. Brakspear, who called attention to the interesting series of Hungerford tombs, and the collection of Commonwealth armour displayed on the walls.

The journey was then resumed to Bradford-on-Avon, which, from its having been visited by the Institute so recently as 1887 from Salisbury, had not been formally included in the programme. So many members, however, expressed a desire to again inspect the place that a halt was made to allow of visits to the Hall, the parish and Saxon churches, and the Barton farm and barn.

The party subsequently returned to Bristol by the 6.41 p.m. train.

Wells Cathedral, etc.

At the evening meeting Mr. Hope read a paper on the architectural history of the cathedral church of Wells, with special reference to the site of the earlier church, and the building of the present structure. From the evidence of the topography of the city, Mr. Hope showed that the earlier building probably crossed in an oblique direction the site of the present cloister, and continued to be represented until late in the XVth century by the "Lady Chapel in the cloister." This perhaps included a portion of the older structure, since it retained its obliquity of axis as compared with the present church. This latter, Mr. Hope contended, could be shown by the recent researches of Canon Church among the Chapter monuments to have been begun on a new site by Bishop

Reginald (1174-91), and slowly carried on during the ensuing episcopate of Bishop Savaric, who may have completed its Lady Chapel. Under Bishop Jocelin, who succeeded in 1206, the building practically stood still on account of his long exile, the interdict, and other causes, and was not continued until 1220, when a huge grant of oak trees by the King "for the making of the limekiln," points to the beginning of some new work on a great scale. This, Mr. Hope believed to be the west front, which was probably completed as high as the roofs at the bishop's death in 1242, as well as most of its magnificent and unrivalled series of statues and sculptures. By the aid of a large plan with movable pieces Mr. Hope also explained the later alterations and additions to the church, as a preliminary to the forthcoming visit of the Institute to the building itself.

On Monday, the 25th, the party went by special train to Wells, and on arrival made its way on foot to the fine parish church of St. Cuthbert. This consists of a XIVth century chancel of four bays, with somewhat later aisles of three bays, north and south transepts of the XIIIth century, a nave and aisles of seven bays, with south porch and an exchequer or treasure-house opposite on the north, north and south chapels west of the transepts, and a western tower; there is also a small vestry north of the chancel. The architectural history was explained by Mr. C. R. Peers, who pointed out the curious manner in which the original XIIIth-century arcades had been taken down and rebuilt stone by stone, in the XVth century, when the pillars were lengthened by a some 7 ft. The church had also undergone a considerable remodelling at the same time, and the stately western tower was then built to take the place of the older one at the crossing. Mr. Peers also called attention to the mutilated reredoses of the Trinity altar in the north transept, and of the Lady Chapel in the south transept. The latter was made by contract by John Stowell, freemason, of Wells, in 1470, and contained an elaborate representation of the Tree of Jesse and Genealogy of Our Lord. Many interesting painted and gilded fragments of the statues, discovered during a restoration of the church in 1843, are stacked away in the aisles.

The cathedral church was next visited under the guidance of Mr. Hope, who pointed out the chief features of interest and the various stages of its architectural history. On the invitation of Sir H. Howorth, the Count de Lasteysie expressed his views upon the building. While agreeing with Mr. Hope that the work had been continuous from east to west, he was inclined to regard the transepts and nave as Bishop Jocelin's work, and the west front and its sculpture as later than his time. Mr. Hope, in reply, pointed out the use throughout the transepts and nave of the square abacus, and the general resemblance of the work to that at Glastonbury, which could be dated to 1184-1189.

After luncheon a visit was paid to the Deanery, which was inspected under the guidance of the Dean, Dr. Jex-Blake. The fine hall of the Archdeacon's house, now the Theological College Library, and the picturesque street of houses forming the Vicars' Close, with its ancient chapel, hall, etc. were next examined, and, after viewing the exterior of the cathedral church and the sculptures of the west front, a halt was made at the Bishop's Palace, the chief features of which were described by the Bishop of Bath and Wells. The party afterwards returned to Bristol by special train. The concluding evening meeting was held at the Palace of the Bishop of Bristol, when the Bishop read a short paper on the history of the See, and votes of thanks were passed to all those who had assisted in carrying out so successfully the Bristol meeting.

Tuesday, the 26th, the concluding day, was devoted to a visit to St. Pierre, Moynes Court, and Mathern, and to Caerwent and Caldicot. At St. Pierre the manor house was first examined, by the kindness of Major and Mrs. Stacey. The buildings are arranged round a courtyard, entered by a good but plain Tudor gateway, but have been much modernised. The adjoining parish church is of early Norman date, with some interesting coffin slabs. A walk across a couple of fields, past the site of a large moated homestead, brought the party to Moynes Court, a picturesque gabled house, built by Francis Godwin, Bishop of Llandaff, in 1609. In front of the house is a pretty enclosed garden, entered by a simple gatehouse of the XIVth century. The walk was continued across to

* Continued from last week.

the fields to Matherm, where the parish church of St. Twedric was first visited, and described by the Rev. W. Davies. The building consists of a XIIIth-century chancel and nave, with north and south aisles, and south porch of late XIVth-century work, and a western tower of the XVth century. The nave and aisles have good wagon roofs. The church is reported to be the burying place of Theoderick, King of Morgannek, commonly called St. Twedric, who was accounted a martyr though his having been slain in a battle against the pagan Saxons at Tintern in 600.

The ancient palace of the Bishops of Llandaff, which adjoins the church, was next inspected by the kindness of the owner, Mr. Tipping, who also lucidly described its history and arrangements. It includes the remains of a courtyard house of the XVth century, with a three-storied tower-porch, but the hall wing has been destroyed, and the house generally altered in late Tudor times. Part of an earlier house of the XIVth century is also preserved, with the remains of the gatehouse by which it was entered. After inspecting the beautiful gardens of the house, the party returned to Chepstow for luncheon.

The afternoon was devoted to a visit to Caerwent, where the abundant traces of the Roman town, now in course of systematic excavation, were inspected under the guidance of Mr. A. T. Martin and Mr. T. Ashby, jun. Special interest was taken in a newly-discovered gateway in the south wall. From Caerwent the journey was resumed to Caldicot Castle, the many interesting features of which were pointed out by its present possessor, Mr. G. W. Cobb.

The party subsequently returned to Bristol, and a most successful meeting was thus brought to a close.

THE SANITARY INSTITUTE CONGRESS.*

SECTION II.—ENGINEERING AND ARCHITECTURE.

The first sitting of this section was held on Wednesday in last week, under the presidency of Prof. Henry Robinson, M.Inst.C.E., who, in the course of his presidential address, said he recognised that the subjects which interested all those who were engaged in advanced sanitary work in engineering and architecture covered a very wide area, and therefore he would confine his remarks to those matters with which he had to deal with in his professional life. In advising as to the expenditure of public money on sewage outfalls there was abundant data now to determine the right system for each place. He was quite confident from his experience that the conditions varied sufficiently to require intelligent and impartial consideration to be given as to which of the several systems or combination of them best met each case, as it was too often the practice to apply an arrangement of works, or a system, to an outfall because it was applied successfully somewhere else, although the conditions varied materially. The want of proper provision for dealing with storm water at outfalls was often a fruitful source of trouble. He had examined several sewage outfalls where the results were unsatisfactory, and had found the failure mainly attributable to the fact that the discharge at the outfall, through defective construction of sewers or otherwise, more than three times the normal dry weather flow, which the Local Government Board required to be dealt with as sewage, prevented whatever system of treatment was in operation from having a chance of success. Waste land of a pervious character, or rough filter beds, if no land was available, should receive discharges due to abnormal rainfall, which should be carefully differentiated from the normal flow of sewage. In any arrangement of sewage disposal works a sedimentation tank is now regarded as useful in order to arrest the suspended inorganic matters in sewage which tend to clog any kind of bed. The neglect to adopt this simple preliminary treatment had caused most of the difficulties in regard to the silting up of bacteria beds. It had been found that fluctuations in the purity of effluents from bacteria beds will occur when the quality and quantity of the fluid applied varies considerably, and this was only what might be expected. New bacteria beds required to be treated at the outset with small quantities of fluid until they have become ripe. Experience had shown that with a given area of land a much larger volume of foul fluid could be bacterially treated by the trickling or sprinkling system than by the contact system. In either

* Continued from last week.

case the selection of suitable material for the beds is all important, and that which is used must be governed by the locality. In determining what standard of purity of effluent should be required the circumstances of each case would have to be dealt with. Perhaps some minimum standard might be fixed, but there should be no question as to the necessity for carrying out remedial works to prevent crude sewage being discharged into rivers and estuaries to cause nuisance. However skilfully outfall works may be designed and carried out, after all the results depended on efficient management, and he felt that some supervision by an official inspector of outfalls would be an advantage. The question of the better conservation of the rainfall of the country was one of national concern, and yet it had not received the attention it required on the part of the Government. What was imperatively required was an authority having control over the whole of a watershed area and responsible to a State department. The Royal Commission on Sewage had indicated the desirability of forming river boards, and the President of the Local Government Board had raised the hope that he would bring before Parliament a Bill to deal with these matters. He thought a Royal Commission would facilitate matters by bringing into definite shape the lines which legislation shall follow.

The Chairman touched on the heavy rainfall of last year, one good result of which was that by preventing dust blowing about, and by cleansing the drains, sewers, and surroundings of houses, there was a reduction in the death-rate. The adoption of wood-paving and asphalt in the main thoroughfares, although attended with less noise, required, especially during dry weather, systematic cleansing with hose and water, and good scavenging. As bearing upon road sanitation the present method of preparing the surface of main roads left much to be desired, for the constant patching of the very uneven surfaces was serious. He was hopeful that in the near future the main roads would be covered in a way that would be smooth, durable, and as noiseless as any existing arrangement, and he had under observation forms of construction which warranted him taking that view. In conclusion he welcomed those attending the section, and expressed the earnest hope that the outcome of their deliberations would tend to advance the great object the Institute had in view in promoting sanitary knowledge.

Control of Water Supplies.

On behalf of Mr. J. R. Kaye, Dr. Johnstone gave the chief points of a paper on "The Supervisory Control of Water Supplies." The author pointed out that the legal duty of providing a water supply usually rests absolutely on the individual sanitary authorities, of which there are no less than 1,800 in England and Wales. Obviously a very large proportion of these authorities must look beyond their own area for the source of supply, and thus it had come about that in many parts of the country there has occurred something like a scramble for the best available supplies. There was now a wide and growing feeling that some form of supervisory control is absolutely necessary to apply to all future schemes if not to many of those already carried out. The author dealt with the many remedies which had been suggested, and said that whatever class of supervising authorities is created they must possess or be able to acquire complete and detailed local knowledge of the area under control, so as to be able carefully to weigh the interests of all parties concerned in the protection and allocation of the water supplies in that area; not merely taking cognisance of the contending authorities, but duly appreciating the rights of silent parties, and even giving a thought to those of the non-existent communities which the future may see. The supervising authorities must be large enough to take a broad and complete view of the situation, yet not too large to undertake the co-ordinating and supervising of the actual local or parochial control which is so badly-needed, especially in some of the following directions:—

1. To supervise the collection, storage, and distribution of water supplies, with power to inspect all works. To direct measures for the better husbanding of supplies where necessary, and to promote economy by suitable combination of districts. To see that there are no unauthorised departures from schemes as approved.

To frame regulations for the protection of gathering grounds, and to enforce the exclusion of particular supplies where necessary. To approve of emergency measures in the case of scarcity or unforeseen eventualities.

2. To establish and carry on a regular system of comparative examination (physical, chemical and bacteriological) of all the public water supplies in their area, and thus gradually build up standards for each supply. Experience has shown, over and over again, that the significance of analytical data is relative and not absolute; that is to say, the early detection of slight mischief can best be made by comparison with previous regular records of the same supply.

3. To supervise all means for the corrective treatment of each supply, e.g., storage, filtration, softening processes, chemical treatment for the prevention of plumbo-solvent action, etc. As things are at present these processes usually give excellent results when first established, but changes in staff or personnel of the water authority often induces corresponding changes in the efficiency of the treatment—or considerations of finance and local politics bring about laxity and irregularities of which the consumers of the water remain in blissful ignorance. The recent report of the Local Government Board on lead poisoning has clearly shown that this single phase of the supervision of water supplies is an urgent matter of no little magnitude, affecting both old and new supplies in many parts of the country, and having no connexion whatever with the function of a Rivers Board.

4. To keep a watchful eye on the health statistics of the various communities within the area, with a view to studying the influences of the water supplies upon health at all seasons. To investigate any disturbances observed, and apply remedies.

5. To group together areas for the purpose of distribution, and to secure water for them on equitable terms, and generally to represent their interests in obtaining adequate and permanent supplies, and preventing the depletion of their natural sources by outside districts.

6. To regulate, supervise, and enforce where necessary the supply and use of water for other than domestic purposes in the interests of the public health, e.g., sewer flushing, road-watering, etc.

Dr. Barwise expressed the opinion that it was thoroughly absurd to suggest that Rivers Boards should be the supervising authorities over water supplies.

The Chairman moved, "That this meeting is of opinion that the whole question of water supplies demands investigation by a Royal Commission appointed specially to deal with the subject, and that representation be made to the Government accordingly."

The resolution was carried.

Domestic Sanitary Engineering.

Mr. Gilbert Thomson, M.A., Assoc. M.Inst.C.E., read a paper on "Domestic Sanitary Engineering in the West of Scotland." He referred to the unsatisfactory state of affairs when in 1883 he read a paper on "House Sanitation in and Around Glasgow," and said a vast change for the better had come about since then. The present position might be briefly described by saying that the standard arrangement of to-day is in its essentials very similar to the most advanced work of twenty-one years ago as regards design; that a first-class system of house drainage is now made of iron almost throughout; that the old notion of substantial and comfortable-looking woodwork has given place to the new one of impervious and non-absorbent construction; and that everything must now be done to the satisfaction of the sanitary inspector. In every new house, be it mansion, cottage, or tenement, and in every old one where suspicious circumstances have emerged, the drainage system is as a matter of course tested by smoke by the Sanitary Department. The question then arose whether the present methods are the best for securing good results now and satisfactory progress in the future, and his opinion was that they were not. The present standards of design, construction, and testing for the great majority of houses were simply those of the various building regulations. These regulations dated ten or twelve years back. Internal evidence suggested that their framers tried to ensure sound work and hoped they would get it, but had considerable doubts about it, and at that time probably their doubts were justified. Their tradesmen, however, had risen to the occasion and they

now found no difficulty in getting work far better than could then be generally anticipated. On the other hand, the ordinary run of work could only just pass muster, and this was not because of any great economy thereby effected, but because their regulations and methods of inspection did not give any inducement to do better. He was satisfied that it would be possible to bring all work up to the standard which was now regularly attained in high-class work. He thought they should get rid of the grotesque notion that two classes of sewage, having their origin in the same apartment and their termination in the same drain, must travel by different routes. Any such change depended on the possibility of ensuring tightness, and that for all practical purposes could be attained by the simple means of effective testing. The author dealt with the smoke and water tests, and advocated the air test as being a simple and convenient means whereby it could be proved in a few minutes whether or not a drainage system was tight.

A vote of thanks was passed to the author of the paper.

Sanitary Fittings.

Mr. John Shanks, in the course of a paper on "Sanitary Fittings," said he would confine himself to those connected with the most economical and commonsense method of disposing of sewage—the water carriage system. In an ideal building all fittings and drains should be designed and arranged so that waste matter of every kind may be carried outside as quickly as possible, and the necessary rooms and appliances should be so placed against outer walls that they may receive the maximum amount of light and air. The following general laws should always be conformed to:—1. The material used should be impervious, and, wherever possible, pipes should be left uncovered. 2. The general construction should be such that the accumulation of dirt can everywhere be easily prevented. 3. The supply arrangements (traps, etc.) should be such as to do their work as quickly as possible. 4. Bath and lavatory discharge, overflow, and waste pipes, as well as traps and pipes leading therefrom, should always be from 1½ in. to 2½ in. diameter, i.e., should be large enough to carry off the water with all supply pipes running full bore. The overflow pipes should be readily accessible and movable, so that they can be taken out for cleaning. The traps should be so placed that they can be easily fitted, removed, or examined; they should, wherever necessary, have large and properly contrived ventilating pipes (this prevents its siphonage or noisy discharge); and they should be self-cleansing. The best material for their construction is cast brass, or cast-iron enamelled, which does not give way under the action of hot water and soap as lead does. The best material for supply and waste pipes is copper, or brass nickel-plated.

Drainage of a House.

Mr. Samuel Smith submitted a paper on "The Drainage of a House." The author stated that it was not intended in the paper to discuss the method of drainage but rather to consider the relative merits of cast-iron and earthenware pipes when used for underground drainage. Through inferior qualities of earthenware pipes being used, the results thereby being unsatisfactory, cast-iron pipes, in a great many cases, are now substituted for them. So long as cast-iron pipes can be kept free from corrosion they may be regarded as being satisfactory for drainage purposes. Corrosion, however, soon sets in, with the result that the velocity of flow of the sewage matter in the pipes is seriously impeded, and the efficiency of the drain is lost. Details were given by the author of a number of tests made on various preservatives of cast-iron pipes by a weak solution of sulphuric acid, in every case the preservative being affected. It might be argued that a system of house drainage was not required to stand the action of acids, and that those tests were no guide to the suitability of cast-iron pipes connected with one of the preparations mentioned for the carrying away of soil and waste from dwelling-houses. He held, however, that a drain should be able to stand the action of any kind of liquid which might be poured into it. No objection on the point could be made against fireclay pipes of first quality. Details of tests made on fireclay pipes were next given, from which the author adduced the following conclusions:—(1) That a 6-in. layer of concrete round a pipe made the pipe sufficiently

air-tight. (2) The liability to fracture through unequal settlement of the ground on which they are laid may be overcome by the laying of a bed or layer of concrete underneath the pipes. He recommended that with regard to the joints nothing but a slow-setting cement, thoroughly cooled and aerated, be used, and that it should be well staved into the joints so that all the air in the cement be forced out and a thoroughly air and water joint would be the result. With regard to cost, also, there was considerable economy in the use of fireclay pipes. In conclusion, he suggested that fireclay pipe-makers should test their pipes to say 60 lb. of hydraulic pressure, and sell their pipes with a guarantee that they will stand that test. If this were done the users of pipes, in the knowledge that they were getting a satisfactory article, would readily pay an additional 10 per cent. on the cost of them, and the result would be more satisfactory to all parties concerned. Improvements have been made in recent years on fireclay pipes, and further improvements could and would be made if makers saw that it was to their advantage to do so, through there being a demand for a superior article.

Defects in House Drains.

Mr. J. W. Pearson, C.E., dealing with the subject of "A Few Common Defects in House Drains," said defects dealt with in the paper were chiefly those arising from the adoption of manholes with open channels, and the use of earthenware pipes. The best manholes of this description could not, without elaborate precautions and great expense, be made to remain air-tight, and in any case their walls, bottoms, and channels become foul; they interfere with the effective ventilation of any system of drains upon which they are used; when deep they are huge receptacles for foul air, which is not removed by the ordinary drain ventilators; they are often the cause of stoppages; and where metal access covers are used at all, these are often so fixed, or in such a condition through neglect, as to form a ready outlet for the foul air contained. Although they may look very well and very convincing when new, they never satisfactorily stand the test of time. The advantage to be derived from a perfect drain is at once annulled by the existence of a manhole which in a short time becomes defective and allows foul air to escape, perhaps under a window or floor ventilator, or it may be direct into the house itself. By using closed access bends or junction pieces instead of open channel inverts in all manholes, not only is the volume of foul air greatly reduced but it is confined to the pipes, and the manholes become what they really ought to be, viz., a means of access to, but not an actual part of, the drains; and this without adding to their cost. Earthenware pipes which are wholly unfit for the purpose are often used, but even when they are, of their kind, satisfactory, many defects crop up in laying them, any ordinary labourer being considered fully qualified to carry out this part of the work. They are also liable to injury when filling in or beating down the trenches, and any slight settlement of a wall or building is sufficient to break the pipes or the joints, and even the natural consolidation of the trenches may do so. The great number of the joints adds to this risk, and it is seldom that one tests an earthenware system of house drains that has been down for a few years without revealing defects more or less serious. By the adoption of iron piping the majority of the defects common to earthenware become at least very improbable, but where the drains are of iron, all connected traps, etc., should be of iron also; a connexion between an earthenware gully and an iron pipe is seldom a satisfactory one. Glass enamel, though providing a very smooth interior surface to an iron pipe, is not always a safe preservative, as it is not proof against the action of acids, and as the latter are likely to be present in the sewage it should be avoided. Iron pipes should, however, always be treated with Smith's solution. In several towns earthenware drains are not allowed to be laid under any building, but if this were carried further, and neither open channel manholes nor drains of other than iron piping permitted within a certain defined distance of any house wall, most of the defects now met with would soon become things of the past.

In the course of a short discussion on the three foregoing papers, Dr. Scourfield (Sheffield) urged the necessity of a second test. This was put into the specification for work for the Manchester Corporation. By the second test

it was discovered if the trenches had been carefully laid and whether the pipes were resting on their sockets. It also showed whether the cement used was good cement.

Mr. W. Parry said he had had twenty years' experience with fire-clay pipes, and he found that if they gave a second water test, and if the work was finished properly and no disturbance took place afterwards by building operations, it was perfectly easy to construct a fire-clay drain which would remain perfectly water-tight.

Mr. Saxon Snell thought that one way out of the difficulty was to require that a better class of labour should be employed. When iron pipes were laid the joint was made by a plumber who was a skilled man, but it was rarely that a builder employed anyone but a labourer to lay earthenware pipes. Another difficulty in laying earthenware drains was that of foundation. If they had a bad foundation it stood to reason that they could only lay iron pipes.

Mr. Smith, in reply, said his contention was that a drain should be laid so as to take any kind of sewage—not only domestic sewage, but any kind of liquid. If a man wanted to make chemical experiments at home his drains ought to be capable of carrying away his chemicals.

Mr. A. G. Wallis agreed that the second test was a good point. The only objection to cast-iron pipes was that they corroded outside, but if the trouble was taken to put gravel round them they would be saved from corrosion.

Distribution of Sewage on Filters.

A joint paper by Dr. Geo. Reid and Mr. J. E. Willcox, Assoc. M. Inst. C.E., followed, on "The Importance of Uniform Distribution of Sewage on Filters."

Mr. J. E. Willcox described the experiments recently undertaken by his firm in connexion with Dr. Geo. Reid, the County Medical Officer of Health for Staffordshire, which are the first in which power-driven distributors had been used. The experiments were carried out at Hanley, where there was a population of 62,000, and were on a large scale, dealing with 500,000 gallons per day. Dr. Reid did all the analytical work in connexion therewith. The installation for the purpose of the experiments consisted of a small detritus chamber and an open septic tank of 500,000 gallons capacity, together with two large filters having a total area of half an acre. The travelling distributor consists of a carriage with wheels running on rails fixed on each side of the central trough and supporting a pipe in the form of a siphon, with trapped outlet, by means of which the sewage is drained over the side of the troughs into the distributing pipes. The apparatus travels backwards and forwards the whole length of the filter, and by means of a simple automatic valve arrangement each side is fed alternately to insure equal intervals of time between each discharge on to the bed. The power required for the quarter-acre filter is only 1.08 horsepower, and the actual cost of driving the distributor, including labour, is 2s. 6d. per day of twenty-four hours, the quantity of sewage dealt with during that period being 250,000 gallons. The experiments had been carried on continuously by night and day, with occasional stoppages for slight repairs, for a period of fifteen months; the volume of sewage dealt with was 100 gallons per super yard, which was gradually increased to 230 gallons, and it is intended to still further accelerate the flow. The intervals of time have been varied from four minutes to seven minutes, the best results from a given volume being obtained with the longer interval. The neighbourhood of the sewage works is thickly populated, but no nuisance has arisen from them. It should, however, be mentioned that the sewage is discharged only a few inches above the bed. No difficulty was experienced by reason of frosts during the cold weather last winter, including four nights when no less than sixteen degrees of frost was registered. The results of the experiments have been so satisfactory that the author's firm has been instructed to carry out a complete scheme for dealing with the sewage of the borough on the same lines, it being intended to adopt rectangular beds, and eighteen power-driven travelling distributors, each controlling half an acre filter-bed, and capable of dealing with some 12,000,000 gallons per day.

Dr. Geo. Reid said it was now pretty generally admitted by those who have been actively at work in endeavouring to solve the sewage disposal difficulty by artificial biological methods, that "filtration" is to be preferred

to "contact" as a means of effecting the final process of oxidation. In advising the Hanley Corporation to construct the experimental works they had three chief objects in view, viz., to determine (1) whether the sewage in question could be disposed of by treatment in resolving tanks, followed by simple filtration; (2) the area and depth of filter necessary in view of the highly efficient means of distribution provided; and (3) the size of filter particles which would give the best results. They had a pretty firm conviction that with perfect distribution single filtration through a depth of filter of about 4 ft. 6 in. would answer the purpose, and that this conviction was justified had been demonstrated by the results of about eighteen months' working. In the case of the circular filter a constant and regular flow of 200 gallons per superficial yard was maintained, while in the rectangular distributor, owing to a defect, the mean flow was 162 gallons. Each yard of filter received its quantum of sewage at seven minutes interval, as recommended by Mr. Scott-Moncrieff. The author gave the analyses of sewage and effluents dealt with, and said the conclusion to be drawn was that in every case the degree of purification which had been effected was excellent.

Dr. Fowler (Manchester) protested against Dr. Reid's sweeping assertion that filtration was to be preferred to contact. Seeing that more sewage was purified in England by the latter process the assertion would not stand. He noticed that the cost of the Hanley system was fairly large, being about 10s. 6d. per million gallons. If they could build and work contact beds at about 3s. 6d. per million gallons, it hardly seemed to him that it could be said that filtration was to be preferred to contact.

Professor Kenwood said that no doubt, as far as Hanley was concerned, the results were very good, but they had had to unlearn so much that they must not hold too dogmatic views with reference to the treatment of sewage. He did not doubt that everything else being equal, sprinklers were better than contact beds. If they had purely domestic sewage rather weak, and had sufficient tankage to enable the solid matter to be dealt with efficiently, then no doubt the sprinkling bed was the thing to use; but, on the other hand, he had known cases where, owing to insufficient tankage accommodation, the sprinkling apparatus had to be discontinued on account of the smell, which became a nuisance.

Dr. Barwise said if they had sprinklers they must have a sufficient capacity of septic tank, but by having this they served a large area of other water-tight tankage in the contact-beds.

Mr. Martin (London) said that, in his own experience, he had produced results by single contact which were sufficiently good for the generality of purposes.

Mr. Willeox, replying to various points raised in the discussion, said the greater part of the Hanley district was separately treated. Mr. Martin had raised the important question of cost, and the reason for omitting the cost of the circular distributor was that the whole thing was an experiment. In actual experience, for instance, they found that a 34-h.-p. engine was sufficient, whereas they had installed a 6-h.-p. engine. These and other matters made it an unfair thing to give the actual cost. Now the whole thing was carried on one outside rail, but in a new distributor they would put a centre and reduce the weight, and so be able to work at less horse-power and consequently reduce the cost. The same remarks applied to the rectangular filter. Notwithstanding, he did not consider that 10s. a million gallons was an excessive cost, considering that they got a uniformity of distribution and the absolute control which was required for the purpose of the experiment. A question was asked whether, in the event of the distributor passing more slowly over the beds, the suspended matter came away, and he could answer in the affirmative to that. The whole object of the experiment, however, was to get absolute uniformity, both as to volume and time.

Dr. Reid also replied, and said that if the mechanical distributor did cost more money to provide and work, yet, if they could show that, by reason of the more perfect methods of distribution, they could save a large area of filter and a considerable depth of filter, the matter of cost became a secondary matter. It simply became a question of laying out a little more capital expenditure.

This concluded the sitting of the section on Wednesday.

Portland Cement.

At the sitting of the Section on Thursday, Mr. E. R. Matthews opened the proceedings with a paper on "Portland Cement; the Need of a Standard Test." The author pointed out that never was there a time when cement was used so extensively as now, and it was most necessary that it should pass a standard test. At present the matter rests entirely with the engineer or architect, and what one considers a fairly stringent test another considers miserably weak. He pointed out the fallacy of the old idea of considering that cement that went over 450 lbs. on the sq. in. was over-lined, and therefore not satisfactory. He urged that a 28-days' test, as well as a 7-days' test, are necessary in order to determine the regular increase of strength with age, the latter taken alone (as is the usual custom), he maintained, is not a test at all; it is a complete fallacy to suppose that it is, and he most strongly recommended, as the most reliable test, a sand and cement test. Further, he maintained that a compression test is absolutely necessary, although seldom adopted, and pointed out how such a test may be made.

The Chairman said the paper was hardly one for discussion, as they were all agreed with the necessity of having a standard for cement.

Factory and Workshop Ventilation.

Mr. H. M. Robinson followed with a paper on "Ventilation in Factories and Workshops." He referred to the necessity for thorough ventilation, and said that natural ventilation depended so much upon the construction of the room and the condition and temperature of the air outside that it was impossible to lay down rules on the subject. Natural ventilation might be obtained by openings in the chimney near the ceiling or by shafts through the roof or outside walls. In the lower rooms of buildings of more than one story these shafts should be carried up through the roof if possible, or at least some little way up the outside walls. In sheds, or buildings of one story only, louvre openings in the roof afford a good means of ventilation. Whatever method was adopted, however, it was necessary that the position and size of the openings should be determined by a competent person, and that there should be an ample supply of them. It would probably be found advantageous, speaking roughly, to provide one medium-sized outlet for every five or six persons in the room. The author next dealt with artificial ventilation by means of fans. Satisfactory results could only be obtained, whether the natural or artificial system of ventilation be adopted, if both the inlets and the outlets for the air were of sufficient size and properly placed in each particular instance.

Mr. G. Thomson said the question had a public point of view with reference to the extraction of dust, etc. While it might be satisfactory to the owner to get rid of the dust by discharging it into the air, it might be a nuisance to those around.

Mr. Robinson said his suggestion was that in the room there should be a settling chamber, into which injurious dust could be blown by the fan.

School Ventilation.

Dr. A. Greenwood gave the results of his investigations into the sanitary conditions of 52 public elementary schools at Blackburn. He summarised his conclusions as follows: (1) Natural ventilation is easy to manage, subject to certain conditions, which I have named, and will be more efficient if the fullest advantage is taken of this means. (2) In some schools provided with mechanical ventilation frequent reliance is placed upon natural ventilation. (3) There is a diversity of opinion as to the value of the known systems of mechanical ventilation, and there is a need for further inquiry upon this subject.

Mr. W. Key (Glasgow) said he thought the proper thing would be mechanically to change the air by an apparatus absolutely independent of the vicissitudes of the weather. He advocated the system of plenum ventilation. He thought it was most important that the dust should be removed and that could only be done by the plenum system, which would carry away the emanations. He found from the discussion in technical journals that architects and others were quite able to criticise plans for an infirmary or hospital but did not themselves understand what the word plenum meant, and consequently the public had an idea that plenum ventilation was to be avoided,

Dr. Greenwood said he could not agree with Mr. Key, and could not recommend that mechanical ventilation should be applied wholesale so far as the Blackburn schools were concerned. He found in the two mechanically-ventilated schools they had at Blackburn the results were no better than those obtained in naturally ventilated schools.

Housing and the Public Health Acts.

Mr. G. D. Armstrong read a paper on "The Past, Present, and Future Conditions of Housing Under the Public Health Acts," in the course of which he referred to the evils arising from the loose manner in which the regulations and by-laws were carried out in many cases. The greatest part of the dwellings of the working-classes had been built by speculative and sometimes, perhaps often, jerry builders, whose ideas of sanitary and permanently healthy dwellings did not enter into the case of profits. He did not condemn on the whole the speculative builder—he had been a most important factor in helping to decrease the troubles of overcrowding. The first and one of the most important data bearing on the housing question was the legal definition of overcrowding. He suggested a minimum of 400 cub. ft. per adult for all rooms. All associated houses, and all houses let in lodgings, for the working classes should be registered if required by the medical officer. Dealing with Parts I, II, and III. of the Housing of the Working Classes Act, the author advocated what he described as the "localisation" of land outside the town by the local authority. This was the purchase of land not ripe for building, which could either be held in trust for the ratepayers or immediately developed. Rapid and cheap transit must accompany localisation schemes. Most municipal work cost 20 per cent. more than ordinary building, owing to the many useless restrictions which should be abolished.

Councillor Burgess (Glasgow) said in Glasgow they had 104,000 people living in one-apartment houses, with a diversity of 34 persons per room. He contended that a local authority ought not to encourage and perpetuate one-apartment houses.

Dr. Honeyman (Glasgow) submitted that the great thing in the housing of the poor was to have cheap dwelling places. The death-rate was not due to the smallness of the houses but to the way the houses were occupied.

Dr. Sykes (London) criticised the idea of localising land in the way suggested, because if it was held it might become totally unsuitable for housing purposes. Of course, it might be said that the Corporation could sell the land, but that opened the path to municipal trading in land, and he did not think Parliament would allow that. He agreed that it was quite unnecessary to enforce the expensive construction required by the by-laws, and hoped they would be altered. They did not want to build houses to last 100 years, but they wanted cheap houses.

Mr. Munce (Belfast) said the question was not understood either in England or Scotland. They must build houses that a man could afford to live in. Local authorities, instead of selling land altogether, ought to let it for building purposes, and the houses should be built from the point of view of working people and not from the point of view of millionaires.

Mr. Campbell (London) remarked that the financial question was the crux of the whole matter, and they ought not to be compelled to pay the loan back in too short a time.

After further discussion, Dr. Sykes moved: "This Section recommends the Council of the Sanitary Institute to represent to the Local Government Boards of England and Scotland that the definition of overcrowding as 400 cub. ft. per adult person, and half the amount per child, in sleeping rooms is required in the interests of public health."

Mr. Armstrong seconded the resolution, and it was carried.

Cottages for Agricultural Labourers.

Miss Churton read a paper, prepared by Miss Constance Cochrane, on "Cottages for Agricultural Labourers." The writer held that the labourer's cottage should not be built with less than three bedrooms, as the two-bedroom cottage already furnishes by far the larger proportion of the existing supply, and is the unavoidable cause both of overcrowding, and of the herding together in the same room of persons of both sexes and of all ages. The two principal bedrooms should contain not less than 1,000 ft. of cubic capacity each; 300 cub. ft. of space

being the minimum health allowance for an adult or child over ten, and 150 for children under ten. There should also be a fireplace in at least one bedroom. There appears no sufficient reason why stairs should be inclosed between walls, instead of rising out of the kitchen or scullery. Two living-rooms are better than one, but one large room is very preferable to two small ones, and the scullery should be of a size which would make it impossible for the family to live in it. All the windows in the house, including one in the pantry, should be made to open, and should extend to the ceiling. The material used in building is less important, provided the soil is dry, the foundations good, and the walls rainproof, and with damp courses. And it would be well to encourage building with whatever material can be produced most cheaply in the neighbourhood; as is done, for instance, at Winterslow, near Salisbury, where a good detached cottage with three bedrooms can be built for 115*l.* out of the chalk of the country.

The Construction of Hospitals.

Mr. Alex. Cullen, F.R.I.B.A., then read a paper on "The Construction of Hospitals." The author said that he proposed to deal particularly with hospitals for the reception and treatment of cases of infectious disease, yet his remarks would, in a number of details, apply to hospitals of all kinds.

Proceeding, he said:—"Suppose, then, the sanitary authorities of a town of about 100,000 of a population have, after considerable pressure by the Local Government Board, resolved on the erection of a hospital for the treatment of cases of an infectious nature. The next question that comes to be considered is the number of beds for which provision should be made. It is customary to provide one bed for every thousand inhabitants within the area that the particular hospital has to serve. While this may be sufficient under ordinary circumstances, it is always well to provide accommodation on an ample scale. In order, therefore, to meet emergencies in times of exceptional epidemics, which are observed to occur at intervals of three, four, or five years, accommodation should be provided to the extent of three beds for every 2,000 of the population. In this particular case we shall assume that the hospital is to be planned on the higher standard and to accommodate 150 patients.

In the site of a modern hospital for infectious diseases an area of one acre for every twenty beds is considered sufficient, but in the present instance we are dealing with a model town council, and they have the wisdom to foresee the possibilities of a future extension of the buildings, and decide on acquiring ten acres of land. This question of site is a very important one, and it is well that the medical officer should be consulted on the matter, who in all likelihood will direct his attention to its physical conditions, such as aspect, prospect, and inquire into the nature and extent of the sickness and the rate of mortality in the particular district. After satisfying himself on these points, the medical officer recommends a site. It is situated in the open country yet convenient to the district the hospital has to serve, so that patients have to be driven only a short distance. The ground slopes gently towards the south, and it is well sheltered by trees, both on the north and on the east sides. The soil is of a dry loamy nature, and is well under drained. The water level in the subsoil is fairly deep and permanent, and there are no objectionable conditions near that might lead to the pollution of the soil. There is an abundant supply of water for the needs of the hospital, and a good drainage outlet can be obtained. The cost to the land will depend to a considerable extent on the situation, but supposing there are exceptional circumstances to be taken into account a fair value would be from 250*l.* to 350*l.* per acre.

The site having been fixed on, the next matter that comes under consideration is the nature and number of the diseases to be treated. On this question the medical officer will be guided by the statistics of the infectious diseases prevalent in the district more especially during epidemics. His experience also in the practical working of a hospital will indicate the extent of the administrative offices necessary for the effective management.

"Suppose, then, the following programme of classification with explanatory notes has been prepared:—Scarlet fever, 100 beds; enteric fever, 20 beds; diphtheria, 12 beds; measles,

10 beds; typhus fever, 8 beds. Total, 150 beds.

"The accommodation for cases of scarlet fever to consist of two observation or probationary wards of two beds each. In these wards will be received cases considered to be scarlet fever, but in which the diagnosis was doubtful. Here such cases will be detained until the nature of the illness has declared itself. The ordinary pavilions to provide for 72 beds divided into wards of 12 beds for females and young children and wards of six beds for male adults. Attached to each ward there is to be a one-bed ward intended for special cases or for private patients.

"*Isolation Block.*—Of two wards of four beds each for the isolation of cases of double infection, such as scarlet fever with diphtheria, scarlet fever with whooping cough, or scarlet fever with measles.

"*Discharge Block.*—Divided into two wards of four beds each. To this block would be sent the patients believed to be free from infection. Here they would receive special bathing, and be under careful observation for a few days prior to their discharge. These precautions are intended to avoid 'return cases'—that is, cases which occasionally occur in the households to which patients have returned from the hospital.

"*Enteric Fever.*—The accommodation for enteric fever patients to consist of two wards, one for twelve beds the other for six beds, and attached to each a one-bed separation ward.

"*Diphtheria.*—A block consisting of a general ward for eight beds, and four single-bed wards, besides a small room, well lighted from the roof, where operations may be conducted. In the one-bed wards are to be special steam connections to provide a moist atmosphere for critical cases.

"*Measles.*—A block having a six and a four-bed ward intended for the isolation of cases occurring under circumstances involving special risk of the spread of the disease.

"*Typhus Fever.*—A block divided into two wards of four beds each. Although cases of typhus fever are not of frequent occurrence, still it is better to provide for an emergency. This block when not in use for its special purpose would be available as convalescent wards for enteric fever patients when that disease is prevalent.

"*Administrative Block.*—This building should be located about the centre of the group, and convenient to the entrance gate, so that anyone calling on business, or vans delivering stores, would not go near the wards where patients are being treated. Accommodation should be provided sufficient to cope with any emergency that may arise, and the possibility of a future extension should be kept in view. In a hospital for 150 patients there will likely be a staff consisting of a medical superintendent and an assistant, a matron, thirty-nine nurses, fifteen female servants, such as ward-maids, laundry-maids, kitchen servants, and housemaids; besides four male attendants. The ground-floor on one side of the block should be devoted to the medical officer, and the other side to the matron and nurses. On the first floor should be the sleeping accommodation for the matron and nurses, each nurse to have a separate room about 12 ft. by 9 ft. Ample bathrooms and lavatories should also be provided. Special precautions to be taken to have the rooms for the night nurses in an undisturbed wing of the building. The female servants to have their sleeping apartments on the second floor, but entered by a separate stair from that to the nurses' quarters. In the rear would be the kitchen department. The kitchen should be a large apartment well lighted from the roof and thoroughly ventilated. Attached to the kitchen are to be a wash-up scullery, a vegetable scullery, and a service room with a recess for food trolleys; besides the necessary stores and larders. The milk store should have an intervening lobby for sealing milk pans.

"*Laundry.*—The laundry to be removed as far as possible from the infected buildings with which it should have no connexion by covered ways. This block may with advantage be divided into two sections, one for male and the other for female labour. In the first section will be placed, perhaps in the basement, the steam boilers, coal store, fire pumps, engine room, workshop, destructor for destroying the hospital garbage, and a steam disinfecter sufficiently large to receive bedding or other large articles. In the second section would be the wash-house and ironing room. The ironing may be common to the clothes of the staff and

the patients, but there should be separate wash-houses for the soiled linen of the staff. The receiving and discharge rooms should also be separate. The drying chamber would be convenient if placed between the wash-house and ironing room, the hot air being driven into this chamber by a fan; and a fan will also be required for extracting the steam from the wash-house. As a laundry is the place in a hospital where infected articles are gathered, special precautions should be taken. The soiled articles from the wards should be placed in steeping tanks, and the tanks classified for the different diseases.

"*Entrance Lodge.*—This building to be placed near the entrance gate where the head male servant would reside, and his wife act as gate-keeper. Attached to the gate lodge there is to be a waiting room for friends of patients. The accommodation for the male servants to be on the upper floor of the lodge, but entered by a separate entrance. Between the entrance gate and the wards there should be a waiting room for ambulance nurses, and fitted up with a hot plate and shelves for blankets.

"*Mortuary.*—This building to consist of a mortuary and post-mortem room, a small laboratory, and a room for friends to view the body; the body, instead of being placed on a slab in the usual manner, will be laid on a bed, and the bed can be wheeled into the viewing room.

"In the compiling of the programme I assume that the medical officer has been associated with the architect, and the architect will be wise if he continues this association until the general principles of the scheme are fully matured; after which the medical officer will be wise to leave the carrying out of the details to the practical architect. The architect in preparing the plans keeps closely to the programme of classification, and connected therewith the first point to receive this attention is the ward; for the form of a ward governs to a considerable extent the planning of a hospital. It may be taken as an axiom that where land space permits the wards are better if contained only on one floor; the pavilions are, therefore, planned one story in height. The distribution of the several buildings on the site is a matter of the utmost importance, in order that each ward may obtain the fullest amount of sunshine. The longitudinal axes of the several blocks are, therefore, placed north and south on the site, or, perhaps, a few degrees east of south and west of north. By this arrangement sunshine on three sides of the wards can be obtained. The plans are based on this principle, with the result that the wards are arranged on parallel lines, as shown on the block plan to which I wish to direct your attention. The space between the pavilions is 40 ft., and there is a zone of 50 ft. between the buildings occupied by infected persons or things and the hospital boundary. The communication between the several parts of the hospital is direct, and for the comfort of the staff the paths are roofed over but open at the sides.

"The floor area and cubic space of a ward have to be regulated to a considerable extent by a standard set up by the Local Government Board. The area is given at 144 sq. ft., and the cubic space at 2,000 ft. per patient. These units, however, need not be strictly applied in every case. For instance, is it not reasonable to suppose that the cubic space in an acute ward should be more than in a convalescent ward? Besides, medical authorities recommend that in cases of enteric fever and diphtheria the standard should be increased. The width of a ward will regulate the other dimensions, but it should be noted that floor area is of more value than additional height of ceiling. An ample width should be allowed for tables and fire stoves in the centre of the ward, and also to permit of the bed being kept about one foot from the wall.

"Taking all these points into consideration, it seems that 26 ft. is a suitable width and 13 ft. a convenient height for a ward. The width and the height having been fixed, the only question that now remains is the distance between the beds, and this distance will determine the cubic capacity of the ward. In the plans under consideration there is provided 12 ft. of wall space per bed for the scarlet fever convalescent wards, while in the scarlet fever acute wards and in the wards for diphtheria and enteric fever the distance is 13 ft. The cubic space in the one instance is 2,028 ft., and in the other 2,197 ft.

"The window space in a ward will be governed

by the floor area and cubic contents. Experience has shown that in this country one square foot of glass is required for every 60 cub. ft. of space, but where verandahs overhang windows, or where wards are lighted only from one side, the glass area should be increased.

"The bathroom is at the entrance end of the ward and is provided with two baths, one of the usual size of 6 ft., and a smaller one for children. The baths will be rapidly filled and emptied. The sanitary appliances are placed in a turret at one of the distant angles of the ward, and are separate therefrom by a well-lighted and ventilated lobby. Here will be two water-closets and a sink room. In this room will be fitted up a combined arrangement of sinks divided into three sections:—the first consisting of a grooved slope about 3 ft. 6 in. long for the cleansing of macintosh sheets, the second of a scalding sink for washing urine bottles, and the third a sink for flushing bed-pans, and which will serve also as a slop sink. In the sink-room there is also a small cupboard for the retention of bed-pans that have to be examined by the doctor.

At the other angle of the ward facing the south-east is a sun-room, which is divided from the ward by folding doors, so that patients unable to leave their beds can be wheeled into the room. Between the two angle turrets is a verandah for the use of patients who are able to move about. The one-bed ward is near the entrance, and has its own sanitary conveniences.

"The ward kitchen is placed between the two wards, and has an inspection window into each. In this room will be a small fire range or steam closet for keeping food warm; besides a wash-up sink and a dresser. Near the ward kitchen is a nurses' toilet-room and water-closet, a linen store and a milk larder.

"Having given a general description of the plans, let me now direct your attention to the construction, finish, and equipment of the hospital. The essential requirements are ample light and ventilation, no sharp angles or mouldings to catch dust, the wall surface and floors of a hard, non-absorbent nature, also as little woodwork as possible; the whole so planned and constructed as to require a minimum of care or repairs. The method of construction and finish of the plans now shown is intended to accomplish this result.

"The foundations will be of Portland cement concrete, and the damp-proof course of Caithness pavement 2 in. thick. The area under all floors will be covered with a layer of asphalt. The walls will be built of brick 16 in. thick, consisting of a 9-in. outer face, a 2½-in. hollow space, and a 4½-in. inner facing tied together with galvanised iron straps. The ward floors will be of teak wood, and the surface shellacked and wax polished. The skirting will be of the same materials as the floor, and hollowed or coved to a 3-in. radius. The corridors and sanitary turrets will be paved with marble-terazzo, while the bath-rooms will be paved with indiarubber interlocking tiles. The windows in the wards will have the lower part hung as an ordinary window and the top hinged to open inwards. There will be no other projections to harbour dust, and all the facings will be rounded and keyed to the plaster. The glazing will be of polished plate-glass, as this is preferable to double glazing with sheet-glass, for in course of time the space gets filled with dust. The doors will have flush panels and the plainest of furniture. The standarks on which the doors are hung will be checked for the doors and the wall plaster, so that no checks or facings will be required. The plumbing will be executed on the most approved principle. The pipes and fittings will be exposed, and all traps will be ventilated to the roof. The walls of bath-rooms, sanitary turrets, and corridors will be lined to a height of 5 ft. with white enameled tiles. The buildings will be lighted by electricity, and there will be telephonic communication through the several blocks.

"*Heating and Ventilation.*—The boilers for raising steam will be placed in the laundry block, the steam being conveyed in subways to a central point in each block. The steam will be led into calorifiers, of which there will be two—one for the supply of hot water to baths and sinks, and the other for the heating system. Between the beds will be hot-water radiators, with high legs and baffle plates on front and fitted with a ventilating register, through which the fresh air will be introduced. The radiators will be fitted with valves so that the temperature in each ward can be regulated. The heating power will be sufficient to maintain a uniform temperature of 62° in the wards and 57° in

the passage. In addition to the hot-water radiators there will be open fires. The foul air will be extracted by special flues in the walls and by shafts from the ceilings, terminating at the ridge with air-pump ventilators. Each outlet will be fitted with a regulating valve.

Mr. Campbell (London) said the arrangements shown on the plans were good. He liked the arrangements with regard to the sun-room and the verandahs. He would like to know what Mr. Cullen would estimate to be the cost per bed of the building shown on the plans, because he knew that the cost in hospitals had been run up to as much as 750*l.* per bed, and then they were prohibitive. He thought the discharge block was in too close proximity to the general infected area.

Mr. R. Lambie (Lanarkshire) said that Mr. Cullen had put up the Middle Ward Hospital at Motherwell, and he believed it stood unique in that country. It was one of the cheapest and best in the kingdom.

Mr. Wallis read a letter from Mr. Saxon Snell, who was unable to be present, in which he asked the following questions:—"Mr. Cullen advises the provision of the sinks in conjunction with the patent water-closets. I think the more modern practice is to keep them in a separate compartment with separate entrances from the ward. I have not had the advantage of seeing the plan of the ward referred to, but if, as I suppose, the sun-room is of the same area as the sanitary annex, it will be rather small. The whole end of the ward, of a depth of 12 ft. to 15 ft., and with both angles canted, would provide a much larger and better-lighted room. Mr. Cullen suggests ordinary sash window with hoppers at the top. It is the usual practice, but we may hope that in the near future some better form of window with fewer internal angles and grooves may be adopted. It would be quite possible to construct windows with the glass flush with the sash or casement frames. My personal preference is for casements carried down to within a foot of the floor. Doors can now be made absolutely flush both sides and veneered with wide hard wood. Referring to the heating arrangements, modern hospital practice rather than the use of calorifiers of each separate block. It is possible and much better to carry the pipes for one central station. One is always surprised to hear separate radiators with all their dust collecting properties advocated for wards. A couple of 2-in. pipes carried along the walls is a much simpler arrangement. The valves can be kept outside the wards. Ward furniture can no doubt be shod with wood, but indiarubber is better."

Mr. Cullen, in reply, said he saw nothing objectionable in the discharge block being near the other wards, because it was part of the hospital. It was entirely disconnected with the other buildings. He saw nothing to prevent a hospital of the kind described at a cost of 450*l.* to 500*l.* a bed. The cost of the Motherwell Hospital was about 400*l.* a bed. He appreciated Mr. Snell's criticism, but Mr. Snell was speaking of an entirely different type of hospital. Mr. Snell was speaking of a hospital for a city, but this one was for the country. He thought it proper to put the sinks in the same annexe as the water-closets. Mr. Snell thought it was the usual form of annexe with straight lines, but he proposed that it should be circular. If the sun-room was made larger it would take away the sun from the wards, and it was better to have a little sun than none at all. As to the windows there were no angles or grooves—everything was rounded and flush. It was objectionable to have pipes or radiators of any kind, but of the two he thought it better to have perpendicular lines of radiators than horizontal lines of pipes.

This concluded the sittings of the section.

Standards of Purity for Sewage Effluents.

On Friday there was a joint discussion by the Engineering and Architecture and the Physics, Chemistry and Biology sections. Professor Clowes presided.

Professor Dunbar (Hamburg) opened the sitting with a paper on "Standards of Purity for Sewage Effluent." The author stated that after many years of fruitless search it was believed they had at last found means to ensure thorough purifications of town and trade sewage, even in such cases where approved methods, as irrigation or intermittent filtration, are not applicable. What was to be aimed at was that the water of our public watercourses

does not become turbid, discoloured and foul, and that such water sustains fish life. It would be a mistake to search for a reaction that would enable them in one and all cases to affirm whether a certain sewage or effluent is fit to be discharged into the river or not. Such a reaction indicating whether the effluents are sufficiently free from albuminous substances, or from certain products formed in the decomposition of proteids, could come in question in such case only where a thorough purification of sewage seems necessary. He did not intend to formulate definite propositions as to how many standards or classes of requirements would seem necessary, and which requirements ought to be made for the different standards or classes. He limited himself to the discussion of one question of fundamental importance, namely—

"Does what we know of sewage analysis to-day put us in a position to judge from the results of chemical investigation, whether a certain sewage or effluent tends to undergo putrefaction or not?" He proceeded to give the results of various analyses, and said that it was beyond doubt that they were, by using the absolute figures obtained by the methods known to-day, not always in a position to know whether a crude sewage or effluent will putrefy, or will under given conditions create a nuisance in a river. The author summed-up his conclusion as follows:—"The absolute figures obtained even by the best methods of determining putrescible matter in sewage do not in all cases give definite indications as to the putrescibility of any given sample. Effluents of purification works may present a most satisfactory character, and yet under certain circumstances contain as large or even larger quantities of either organic carbon, organic nitrogen, and albuminoid ammonia; as high an oxygen absorption, and loss of ignition as other samples of crude sewage which are in a high degree liable to undergo putrefaction. We should, therefore, give up the attempt to find a standard of general applicability based on absolute figures. A far safer judgment as to the putrescibility of effluents can be obtained by calculating the percentage of purification effected. Simple methods like Kubel's oxygen absorption test give results entirely sufficient for wants of practice, if used only for calculating the percentage of reduction. The analytical determinations spoken of are not needed in all cases. The requirement, that all effluents should be absolutely non-putrescible needs only to be made where the river presents most unfavourable conditions, or where the river districts are densely populated. In many cases it will be sufficient to require only that all coarser suspended matter be removed from the sewage. In other instances all suspended matter, including finer particles, should be removed as efficiently as possible. In other cases, again, the authorities will have to insist not only on the removal of the entire suspended matter, but also on a reduction of between 40 and 50 per cent. of oxygen absorbed by the dissolved impurities, the determination being made after filtering the samples; and there will certainly be such cases, too, where it must be stipulated that the effluents are limpid and entirely non-putrescible. It would be desirable that leading men in Britain and Germany, where the great questions of rivers pollution and sewage purification are at present being discussed more than ever before, should come to an understanding to carry out the examination of sewage on the same lines. In such case the large amount of analytical work carried out in both countries every day, would lead to comparable results, and progress might be accelerated by mutual labour and interchange of ideas."

Mr. Ross (Barnley) said the authorities were composed of business men, and he felt it might be left to them, in conjunction with the chemist, to say what the standards should be.

Dr. McVail (Stirling) remarked that the whole question was whether the effluent discharged into the rivers would putrefy or not. He felt that they could say now that sewage treatment was one of the solved problems of sanitation. What was wanted was not a particular chemical composition, but that the sewage should not undergo putrefaction and not be disastrous to fish life.

Dr. Barwise (Derbyshire) observed that some of the samples of effluent submitted by Professor Dunbar would not be satisfactory in his county, where certain of their rivers were a source of income to the districts through which they ran.

Dr. McLean Wilson (Wakefield) said in his district they did not fix standards. An important point to be borne in mind was the

size and flow of the stream into which the effluent was discharged.

Mr. Archibald (London) said that the question of putrefaction must be determined not only by the actual state of the sewage effluent, but by the amount of water with which it was discharged.

A hearty vote of thanks was passed to Professor Dunbar for his paper.

Septic Tank System of Sewage Disposal.

Mr. W. Shanks described the results obtained at the Barrhead Sewage Works, where the septic tank system was in operation, and which had been designed to serve a population of 10,000 with a maximum sewage flow of 400,000 gallons per day. He gave details of cost, and stated that after the capital was repaid, sewage would be purified at something like 3d. per ft. rate per annum. The present sewage rate is 10d., but less than one-third of this is applicable to purification works. The analyses given showed the satisfactory nature of the purification and the continued efficiency of the works. The municipal council was perfectly satisfied with the purification.

Manchester Sewage.

Dr. Gilbert J. Fowler read a paper on "Recent Experiences in the Treatment of Manchester Sewage." He described the present state of the works, and said that at present two-thirds of the whole of the sewage of Manchester, including storm water, was purified at any rate to the point of being rendered non-putrefactive. Eleven more acres of contact beds would be at work by the end of the year. He referred to the characteristics of Manchester sewage, and gave tables with details of the sludge removed from the open septic tanks. The total volume of sewage filtered by the various beds during the year had amounted to 5,654,872,456 gallons, or 43 per cent. of the total quantity of sewage received at the works. The cost worked out at 3s. 8-6d. per 1,000,000 gallons actually filtered. Dr. Fowler dealt at some length with a table giving comparative results of filtration of tank effluent, which comprised results obtained at Manchester, Acerrington, Burnley, Oldham, and Birmingham. The following were some of the conclusions which appeared to him to be justified by the table:—(1) That it is not possible to say on merely general grounds that one process is to be preferred to another, equally good results being obtained by a number of methods if carried far enough. (2) That percolating filters are more expensive than contact beds in first cost. (3) That whether they justify this extra first cost depends on local conditions. (4) That where pumping would be necessary in order to operate sprinkling filters, as at Burnley, Manchester, and Oldham, then contact beds are cheaper. (5) That where a sufficient area of contact beds can be obtained at a low cost of construction as at Oldham, they are cheaper under all circumstances. (6) That, for purposes of comparison, costs should be calculated on the dry weather flow. (7) That, other things being equal, a small flow per head conduces to economical treatment.

Replying to various points raised in the discussion which followed the reading of the paper, Dr. Fowler said he was not a partisan of any system. To him it was indifferent how sewage was purified so long as it was purified, and done at the least possible cost. He thought they must consider the special circumstances relating to each case. He was interested to hear of cheaply-constructed continuous filters, and if they could be put down at a satisfactory price by all means put them down, but he did ask them to consider the whole thing from one end to the other before coming to a conclusion.

Sewage Disposal on Chalk Soils.

Lt.-Col. A. M. Davies, R.A.M.C., with Mr. W. C. Tyndale, submitted a paper on "Sewage Disposal on Chalk Soils." Tests were made on the site of some barracks on Salisbury Plain, near Amesbury. The sewage from 1,377 men and 523 horses was brought to the land in a crude state, and applied to it directly, and this went on for about two years. The conclusions derived from the experiments made were:—(1) That, in the case of a chalk formation, there is practically no lateral movement of fluid falling on or spread over the surface, but that the moisture passes vertically downward. (2) That, so far as our observations extend, the soakage consists of saturation only, and that in the upper portion of the chalk the

liquid forms no defined lines of percolation, resulting in trickles even where the surface is deluged. (3) That, when the surface is deluged, traces of sewage, as evidenced by bacteria, may penetrate to a considerable depth, but that when sewage is applied in an ordinary and reasonable way over the surface, no such contamination of the subsoil takes place.

Pollution of Rivers by Sludging of Mill Dams.

Mr. A. F. Somerville, Chairman of the Sanitary Committee of the Somerset County Council, in a paper on this subject, said the question was one which is practically outside the question of pollution of rivers by sewers or manufacturers' waste, and arises from the obstruction to the flow of water by the interposition of a weir or mill dam. The law on the subject is at present very unsatisfactory and conflicting, and the author instanced a number of cases which had been decided where the decisions were conflicting. He suggested that the special attention of the Royal Commission, which is now dealing with the prevention of pollution of rivers, be directed to it, and that they be asked to introduce further legislation with a view to the removal of a grave injustice to private individuals, an injury to the public, and a possible danger to water supplies.

SECTION III.—PHYSICS, CHEMISTRY, AND BIOLOGY.

This section held its first sitting on Thursday, under the Chairmanship of Professor Frank Clowes.

In his opening address the Chairman said the subjects which were brought together under this section were naturally associated. Chemistry, Physics, and Biology, not only constitute an ample field, but provide a conjoint area, the dividing boundaries of which are indefinite or non-existent, and over which each of us must more or less frequently have cause to travel. It is commonly considered that there is no very satisfactory delimitation of the field of the chemistry as compared with that of the physics, and it is quite certain that the biologist must concern himself largely with matters both chemical and physical. In respect of sanitary processes, it is indeed constantly found that one and the same purpose may be accomplished by chemical, physical, or biological methods. Perhaps no better instance of the alliance of these sciences can be given than in their application to the methods of sewage disposal. At one time the treatment of sewage by chemical processes was almost universally recommended, and discussion mainly turned on what chemical substances were the most efficient in rendering sewage inoffensive; then electrolytic treatment appeared upon the scene; and at the present time the discussion mainly turns upon the various means of applying biological treatment. The resolving action of organisms, which are excessively minute and are ranged at the bottom of the scale, appears to be likely to supplant the attempted purification of sewage by chemical precipitation and the more costly process of electrolysis. It appears now to be generally conceded that some method of controlled biological treatment will be the generally accepted means of rendering sewage inoffensive and of providing for its disposal. Professor Clowes proceeded to urge on the members the importance of purity of food and air. The increasing use of coal gas, petroleum, and electricity, for heating and motor purposes, was advantageously reducing the sources of atmospheric pollution, but the results thus far attained were very far from securing a satisfactory condition of the atmosphere.

Professor Gerald Henderson (Glasgow), in proposing a vote of thanks to Professor Clowes, remarked that, in view of the fact that the Glasgow authorities were committed to the precipitation method of sewage treatment, it was interesting to find such an authority as the Chairman stating, without hesitation, that the bacterial treatment was the right one.

Purification of Brewery Refuse.

Dr. H. Maclean Wilson read a paper on "Some Experiments in the Purification of Brewery Refuse." The results of the experiments undertaken at Rotherham showed that, although brewery refuse is more refractory than domestic sewage, it is quite practicable to purify it by ordinary bacterial means, aided by a preliminary treatment with lime. Taking

the average results from the table of analyses, the precipitation with lime produces a tank effluent in which, as compared with the crude refuse, the suspended solids have been reduced from 24.8 to 1.3 parts per 100,000, and the albuminoid ammonia from 3.8 to 1.8, while the oxygen absorbed figure is increased to 32.7; it produces, moreover, a liquid which no longer has an acid reaction, although in such a condition that the acidity soon returns. The alkalinity, however, persists long enough to permit of bacterial purification taking place. The double contact treatment of this neutral or alkaline tank effluent further reduces the albuminoid ammonia from 1.8 to 0.7, and brings the oxygen absorbed figure from 32.7 to 7.9—quantities which are still much too high to be satisfactory. The percolating filter fed with the effluent from the contact beds produces an effluent which, when strained through sand, may be considered very satisfactory, the albuminoid ammonia being reduced to 0.15 parts per 100,000, the oxygen absorbed to 1.8, while nitrates have made their appearance, and the earth filter yields nearly the same result. The purification thus effected by chemical precipitation, double contact, percolation, and sand straining, when judged by the amount of albuminoid ammonia, amounts to some 96 per cent., and when reckoned on the oxygen absorbed figure to some 93 per cent. The course taken by the experiments was to a great extent determined by the nature of the existing works.

In constructing works anew for the purification of such refuse, the best course to take would probably be to provide tanks for chemical treatment, a first percolating filter, and another at lower level, and finally a shallow strainer of sand for the removal of suspended matters. The tanks should not be too large, for fear of inducing acid fermentation in their contents, and the filters should be of sufficient area to allow of only a moderate quantity per yard being passed through them. With such an apparatus there should be no difficulty in producing an effluent quite fit to be discharged to a stream.

Other papers were read by Dr. S. Rideal on "The Hygienic Signification of Sulphur in Coal Gas," and a joint paper by Dr. Rideal and Dr. E. Baines on "The Suggested Use of Copper Drinking Vessels as a Prophylactic Against Water-borne Typhoid."

Conference of Sanitary Inspectors.

A Conference of Sanitary Inspectors was held under the chairmanship of Mr. T. F. Strutt, late chief sanitary inspector of the City of Westminster.

The Chairman devoted his opening address to the question of the insecurity of tenure of office of sanitary inspectors. He premised that his remarks did not apply to their brethren north of the Tweed, as he understood they had some security. He went on to show that if the public knew how oppressive their grievances were, and how they hindered their effectiveness, they would not any longer suffer under the present unjust conditions, which he regarded as a menace to public health. How could a sanitary inspector, he asked, be expected to do his duty fearlessly when the Council which employed him was, as was commonly the case, composed of slum property owners, house farmers, jerry builders, and their friends. What he proposed was that the sanitary inspector should have fixity of tenure in his office, with the right of appeal to the Local Government Board, and, if possible, superannuation. In conclusion, he advocated the establishment of a Ministry of Public Health, but he did not want one fashioned upon political lines, governed by a party ignorant of practical public health problems and science. In the absence of a Government Department, he testified to the value of the work of the Sanitary Institute.

Mr. J. H. Clarke, in the first paper, said that a new Public Health Act, embracing the Public Health Acts Amendment Act, 1890; the Housing of the Working Classes Act; the Factory and Workshop Act; the Public Health (Water) Act; and the Infectious Diseases Act, with certain readjustments and additional provisions, was a much-needed legislative reform, the need for which was becoming more and more urgent as the statutes accumulated.

In a paper on "Rights and Responsibilities in Relation to Sanitary Administration," Mr. W. W. Kelso said that nothing strikes deeper at the root of the great social and housing problems than the need for a greater measure of supervision over houses and property, and of

interest in and intercourse with the occupiers. This would play no mean part in the great and much-desired national reform in social and housing conditions. Were the conditions not about ripe for a voluntary system of social reform on the lines of the Elberfeld or Leipzig systems?

Other papers read at the Conference were: "Some Notes on Rural Inspecting," by Mr. T. Brice Phillips, and "What the People Sleep on," by Mr. P. Fyfe.

Mr. Anderson (Middlesbrough) moved that the Conference again adopt a resolution expressing regret that the Council of the Sanitary Institute had not seen fit to appoint one or more sanitary inspectors as members of the Board, and asking them to reconsider their decision.

The resolution was adopted.

Sanitary Science and Preventative Medicine.

At the Wednesday sitting of this section papers were submitted by Sir R. Temple on "Some Administrative Measures Taken Against Malaria and Consumption in the Tropics," and by Dr. Wright on "The Sanitary Condition of the Mercantile Marine."

In the afternoon there was a joint discussion with the section on Physics, Chemistry and Biology on "Shell-Fish and Enteric Fever," which excited much interest and a great deal of discussion. The paper leading up to the discussion was by Dr. A. Newsholme, medical officer of health of Brighton, who dealt with the cases of enteric fever and diarrhoea which appeared to be due to the oysters obtained from polluted layings at Southwick.

Dr. R. M. Buchanan, bacteriologist to the Glasgow Corporation, gave the results of his investigations into an outbreak of enteric fever amongst holiday-makers visiting a small watering-place on the west coast of Scotland. The outbreak was undoubtedly due to the visitors eating shell-fish taken from the foreshore polluted by the sewage of the town. The investigation proved that shell-fish at a distance of one to two miles from the sewer outfall were entirely free from evidence of contamination.

Conference on Hygiene.

On Thursday the Duchess of Montrose presided over a Conference of Women on Hygiene. Miss C. Cochrane, in a paper, strongly urged educated women with leisure to serve on rural councils, where, living in the country, they would naturally be conversant of the needs of cottagers as to water and milk supplies, housing, sanitation, etc., and would be able to furnish their councils with accurate information and suggestions.

The Conference sat again on Friday, under the chairmanship of Mr. Councillor J. Steele, when papers dealing principally with the conditions attending the employment of women were read.

Veterinary Inspectors.

Professor J. McCall presided on Friday over a Conference of Veterinary Inspectors.

In a paper on "Public Abattoirs," Mr. L. M. Douglas pointed out that the construction of public abattoirs in the United Kingdom was in a very backward state, and few had been constructed on modern lines, so far as plant was concerned. The strongest argument for public abattoirs lay in the fact that efficient inspection was possible with them.

Hygiene of School Life.

On Wednesday a Conference was held, under the chairmanship of Professor John Edgar, on the "Hygiene of School Life." Amongst the papers read was one by Miss E. M. Evans on "The Responsibilities of Municipal Authorities and County Councils with Regard to the

Development of School Sanitation.

The author insisted that the condition of the schools, their sufficient ventilation, the proper sanitary accommodation, provision of playgrounds, well-aired cloak-rooms, and a good supply of drinking water afford much ground for discussion and organisation. She suggested that the responsibility of these things should rest on the medical officer of health.

Dr. T. Wood, in a paper on "A Plea for Co-ordination of the Public Health of Schools," said he regarded the rules laid down in the Code by the Education Department as to air space for children in schools insufficient. He suggested that each child should be provided with at least 200 cub. ft. of air space and 15 sq. ft. of

area. It was on the report of H.M. Inspector that the Education Authority acted so that after schools had been built the inspector became the authority in connexion with heating, ventilation, overcrowding, and all matters relating to the general hygiene of the schools for scholars. He contended that the inspector could not possibly be regarded as an expert in such matters, and advocated that all matters connected with the public health of schools should be removed from the control of the Education Department and School Board, and conducted under one authority.

The Conference sat again on Thursday.

School Furniture.

Mr. J. Graham gave some particulars of adjustable school furniture first seen in continental schools. He said the present was an opportune time for all interested in the well-being of growing children and adult students to direct attention to the crying necessity for a hygienic revolution in the school furniture of our country. They wanted desks which would readily accommodate themselves to children's bodies, and seats to provide comfortable support where it was needed. In almost all schools the bodies of scholars had had to accommodate themselves to fixed seats and benches, and many evils had arisen from the system. "Hygienic" desks and seats reverse the old order of things, inasmuch as they accommodate themselves to the bodies, backs, legs, and eyes of the users. They provide, in addition, the natural angle required for reading, writing, and drawing, and the height of desk suited to the length of the scholar's body. In short, "hygienic" desks and seats should be so designed as to lead each person almost unconsciously to assume a natural and hygienic position, and supports for the left arm should be provided in the case of very young children, where necessary, in order that the correct position may be maintained with the minimum of strain.

The collection of *pupitres hygieniques* to which he directed attention have neither the key, the screw, the crank, nor the pinion movement, and have been designed in accordance with hygienic principles. He met with them while touring around Continental schools some two years ago, when they struck him as being a great advance on anything he had previously seen. They were invented by M. Manehain of Geneva, and had been adopted as official patterns by the Swiss Government. Specimens of the desks were imported by the West Riding County Council, and since then, under the direction and guidance of Miss Alice Ravenhill, the firm of Hlingworth, Ingham, and Co., of Leeds, have been making experiments with a view to improving the desks, and to producing seats which may be as satisfactory as is the movement of the desks—that is to say, they were in search of a series of desks and seats for elementary, secondary, and technical school purposes which are readily adjustable for the use of children and adults. The author described in detail a number of the desks, and said that some excellent features which may be claimed for these "hygienic" desks are that (1) they relieve the strain on the eyes, (2) they minimise the strain on the spine, (3) they enable the lungs to have a freer play, (4) they provide facilities for change of position for successive lessons, inasmuch as the scholars may work alternately sitting and standing, and (5) where adult evening work is carried on in elementary and secondary schools, men and women of from 20 to 30 and upwards have not to be squeezed into a low fixed desk built for children, but may get a desk of a suitable height.

Dr. Thomas Wood also read a paper on the "Great Importance of Hygienic School Desks and Seats," and said that the vast proportion of scholars attending school were compelled to sit at desks which caused them to assume postures which had a tendency to produce curvature of the spine and other bad effects.

Closing Sitting.

At the closing sitting of the Congress on Friday, under the chairmanship of Mr. Whitaker, Mr. White Wallis reported that between 1,500 and 1,600 members had been present at Congress. For the first time the Council had invited ladies, and fifty-one had attended.

The recording secretaries of the various sections handed in their reports, and votes of thanks were passed to the Corporation of Glasgow and other bodies for the hospitality offered.

THE ARCHITECTURAL ASSOCIATION.

The following is the list of papers to be read at the Ordinary General Meetings of the Architectural Association during Session 1904-5:—

September 30, 1904.—Annual General Meeting. Address by the President, Mr. E. Guy Dawber, and distribution of prizes.

October 14.—Photography as applied to Architecture, by Mr. E. Dockree. Illustrated with lantern slides.

November 11.—Ventilation, by Mr. W. Henman.

November 25.—Excesses in Westminster, by Messrs. E. Prioleau Warren and J. T. Micklethwaite.

December 9.—Some Architectural Reflections, by Mr. T. Radley Davison.

January 6, 1905.—Libraries, by Mr. Alfred Cox.

January 27.—Byzantine Architecture, by Messrs. E. F. Reynolds and J. B. Fulton.

February 10.—Church Fittings.

February 24.—Country Houses and Accessory Buildings, by Mr. F. J. Osborne Smith.

March 10.—Law Courts, by Mr. H. V. Lanchester.

March 24.—Sketch Plans and Working Drawings, by Mr. A. Newham Wilson.

April 7.—Subject to be announced, Mr. H. Phillips Fletcher, lecturer.

The meetings will be held at 7.30 p.m. on the Fridays stated, at No. 18, Totten Street, Westminster, S.W.

The A.A. Scholarship, value 5*l.* 5*s.*, has been awarded to Mr. C. E. Hanscomb, and the Andrew Oliver prize as follows:—W. A. Hodges (3*l.* 3*s.*), F. T. Bush (2*l.* 2*s.*), P. K. Kipps (hon. mention).


In the studio, the Travelling Studentship (5*l.*) has been awarded to Mr. J. H. Markham.

Arrangements are now completed for the annual excursion, and the headquarters will be at the Digby Hotel, Sherborne.

Among the places to be visited, the following may be mentioned:—Trent, Sandford Orens, North Cadbury, Beaminster, Melplash, Parsham, Crewkerne, Clifton Maybank, Brympton, Newton Surmalye, Milton Abbey, Piddletown, Waterson, Yeovil, Tintinhull, Montacute, and Preston Grange.

Illustrations.

JUMIÈGES.

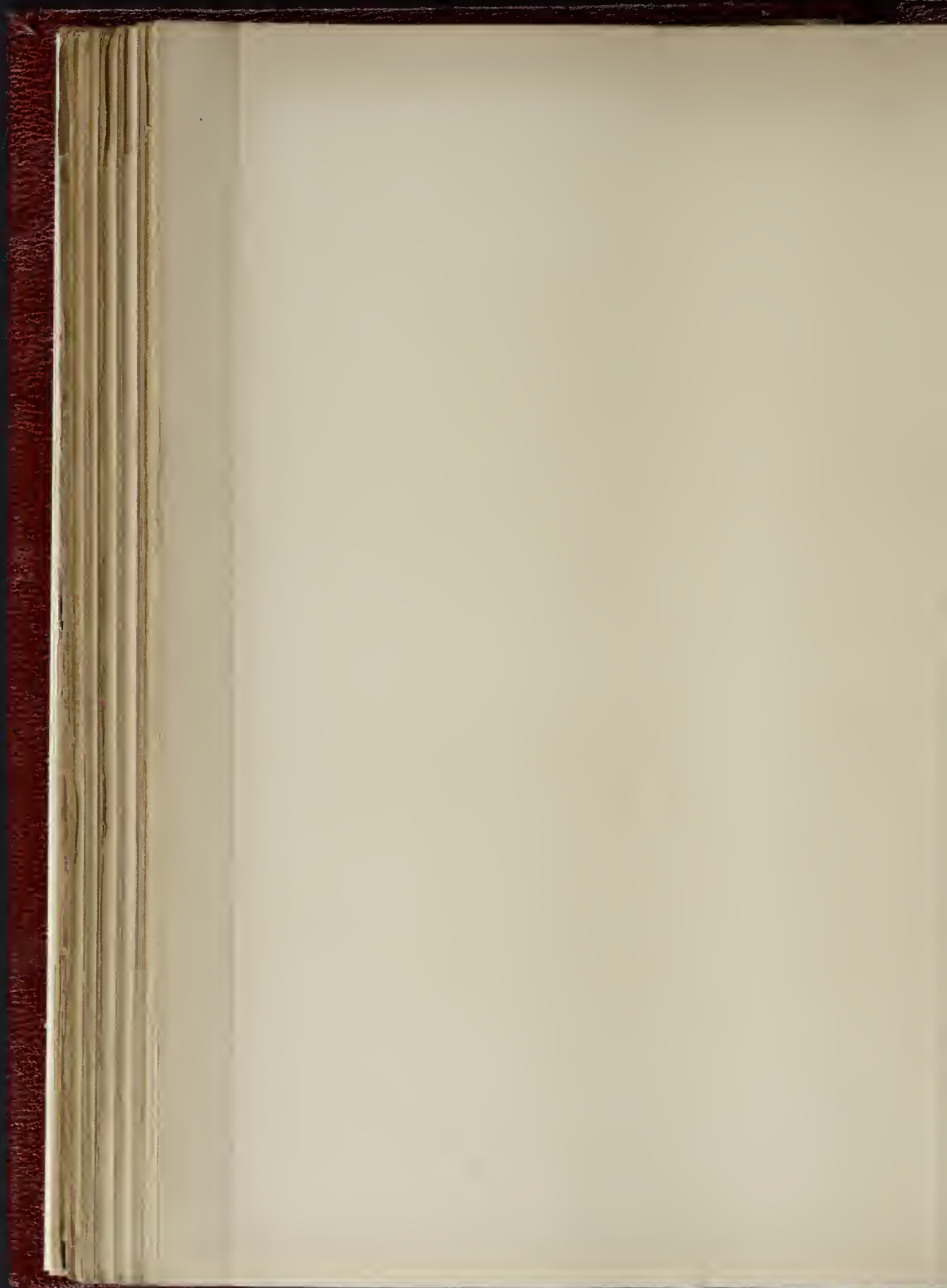
 THE view of Jumièges Abbey is taken from the north-east of the nave. On the right is the north aisle, which, like the upper aisle seen above it, is groined; on the left is the south side of the nave, which was not vaulted. The south aisle has fallen. On the south side are two roofing-shafts, which probably carried gabled transverse arches, the spring of one of which remains, over the nave. The roofing-shafts seem to have been reconstructed in Gothic days, and are now in part of plaster. Above is a glimpse of the south-western tower. The Abbey has hitherto been in private hands, and photography and sketching have been prohibited. Lately, however, it has become an historic monument, and henceforward will be maintained at the expense of the State.

MANOR HOUSE, MOUNT GRACE PRIORY.

THE Carthusian Priory of Mount Grace, near Ingleby Arncliffe, in Yorkshire, commonly called Mount Grace Priory, Northallerton, is by far the most perfect and interesting of the Charterhouses formerly existing in this country. It is doubtful if there is any spot where the arrangements of the mediæval Charterhouse can be studied to such advantage, since there is no feature that cannot be found in one or another of the old dwelling-houses, which date from 1399-1420.

The building with which we are concerned does not, however, belong to the actual part of the establishment inhabited by the Carthusians, but forms part of the range enclosing the outer court, and runs north and south adjoining the old gatehouse, of which nothing remains above the gateway level.

In or about the year 1654 (the date is inscribed on the entrance porch) Mount Grace came into the possession of a member of the Lascelles family, and the new owner at once proceeded to "modernise" a portion of the buildings and turn them into a dwelling-house. This he did by taking a portion of the building on the west side of the outer court, about 130 ft. in length and 17 ft. 6 in. wide between the walls, and dividing it up into rooms by thick cross walls, in which he put fireplaces, and cutting a row of windows along the west front; he seems also to have raised the roof and built a row of three gables with a battlemented parapet between. Of these, only two gables remain, but there is evidence of the existence of the third. He also improved the



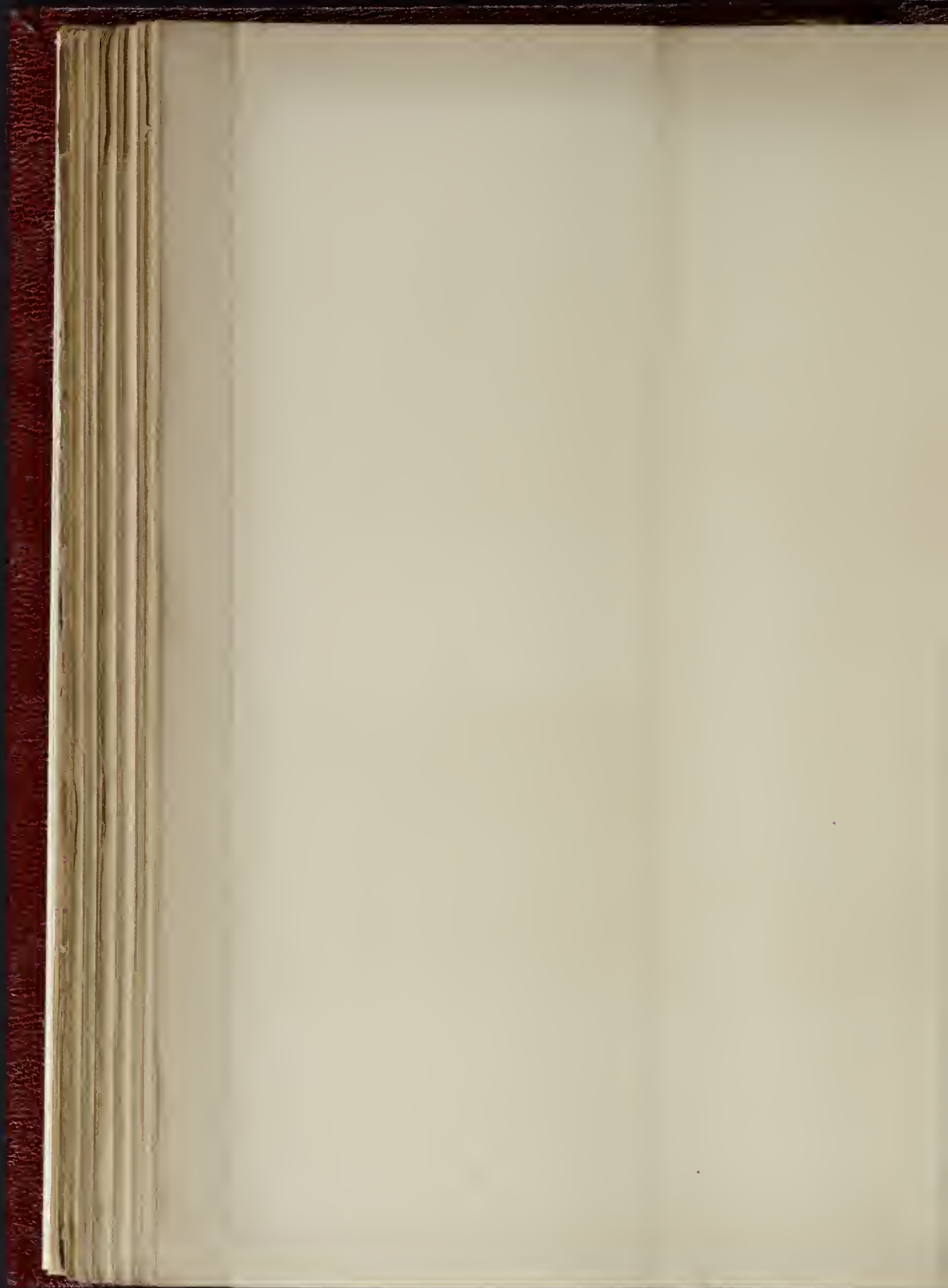


West Elevation.

INK PHOTO, SPRAGUE & CO., LTD., 4 & 5, EAST HANCOCK STREET, FETTER LANE, E.C.

MANOR HOUSE, MOUNT GRACE PRIORY, NORTHALLERTON. ORIGINAL STATE AND ADDITIONS

MR. AMBROSE M. POYNTER, ARCHITECT

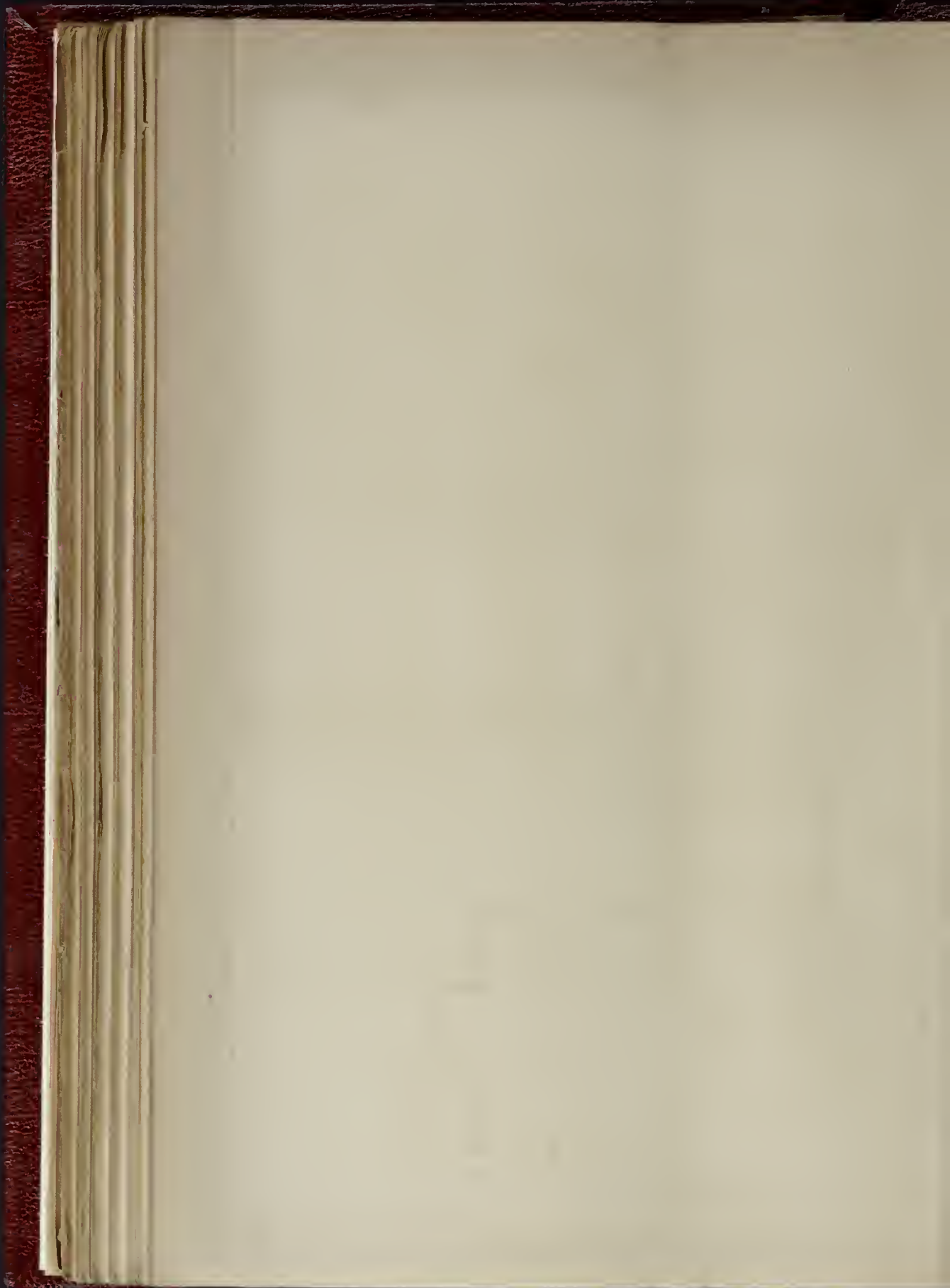




East: Elevation.

119 PHOTO SPRAGUE & CO. LTD. 4 & 5, EAST HANING STREET FETTER LANE E.C.

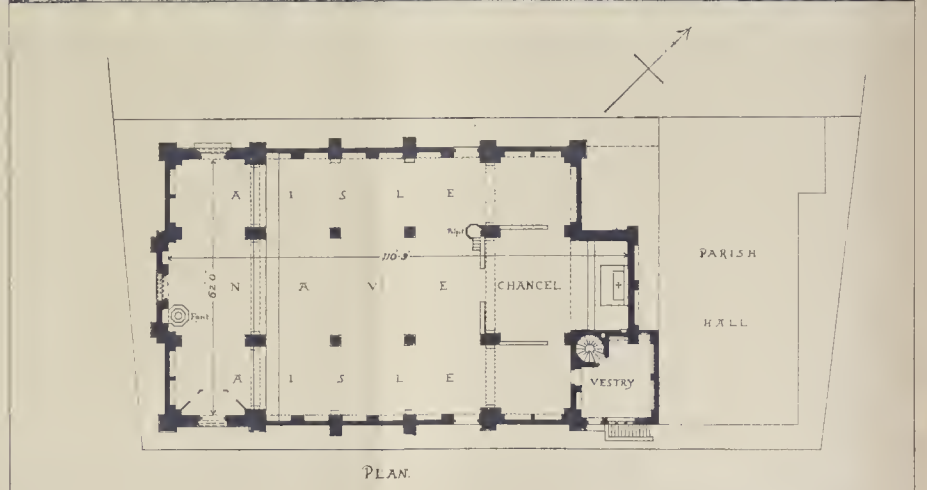
MANOR HOUSE, MOUNT GRACE PRIORY, NORTHALLERTON: ORIGINAL STATE AND ADDITIONS
MR. AMBROSE M. POYNTER, ARCHITECT





ARK. PHOTO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET, PETER LANE, E.C.

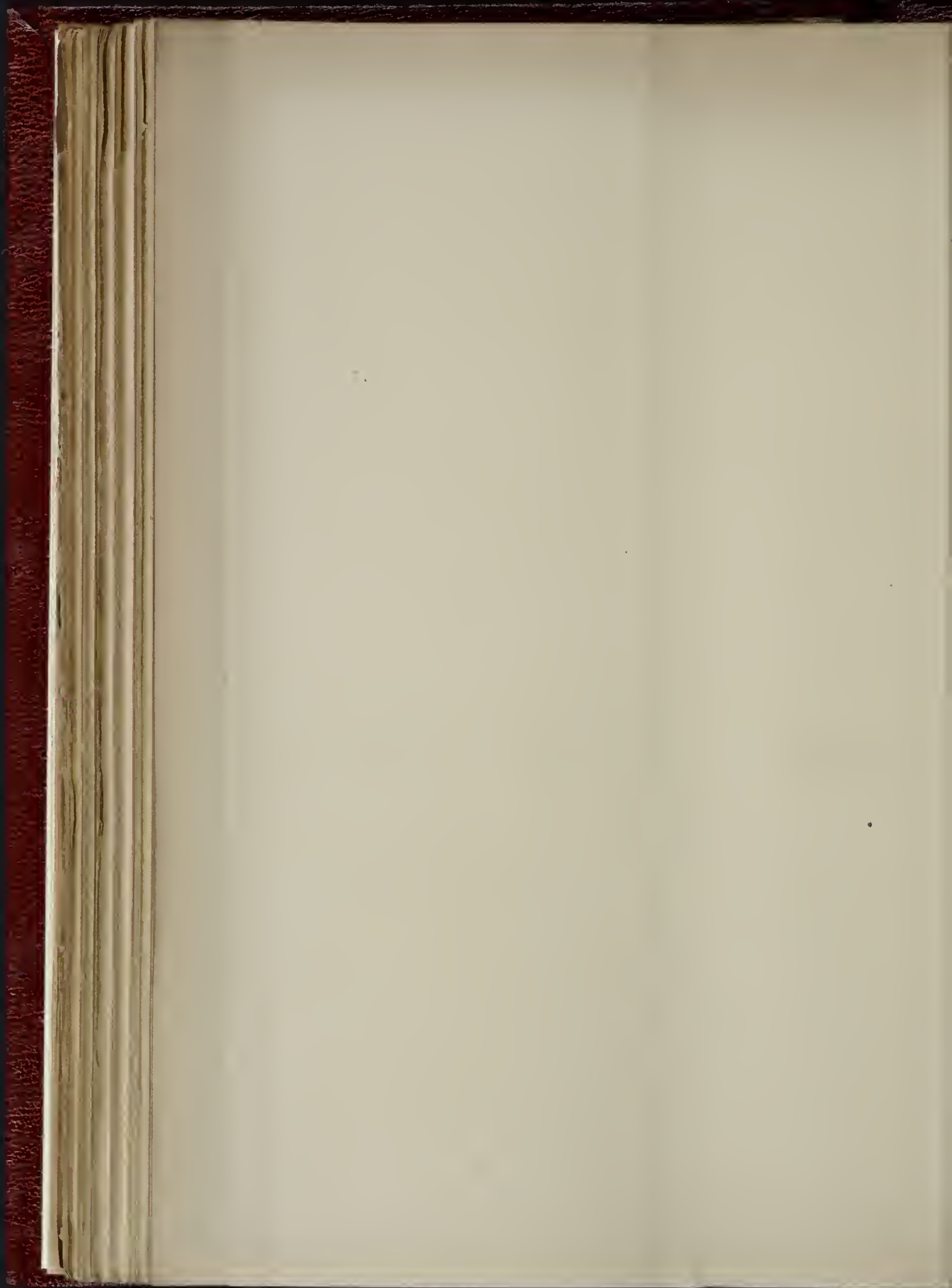
DESIGN FOR A TOWN CHURCH.—By Mr. W. J. TAPPER, A.R.I.B.A.



PLAN.

ARK. PHOTO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET, PETER LANE, E.C.

SKETCH FOR THE CHURCH OF THE ASCENSION, PLUMSTEAD, KENT.—By Mr. C. H. M. MILEHAM



not carried out, though in this case the design was made for a definite situation.

The church was to have been built with concrete walls, faced with rubble, and roofed with concrete vaults, covered with asphalt. It thus constitutes an experiment in a class of materials not hitherto much employed in church architecture.

The design is by Mr. C. H. M. Mileham.

BY-LAWS UNDER THE PUBLIC HEALTH (LONDON) ACT, 1891.

The Public Health Committee of the London County Council reported as follows at the last meeting of the Council:—

On February 16, 1904, we reported as to the necessity for an amendment of by-law No. 26, made by the Council under section 39 of the Public Health (London) Act, 1891, and the Council, on our recommendation, gave instructions for a copy of the proposed amended by-law to be sent to the London sanitary authorities for their observations pursuant to section 114 of the Act. This action was accordingly taken, and we have considered the observations made by these sanitary authorities and also alterations suggested by the Local Government Board. One of the Board's suggestions was that the existing by-law should be repealed and a new by-law made in its place, including a clause providing for penalties.

We are advised that before effect can be given to the alterations suggested by the Board it is necessary to again submit the by-laws to the sanitary authorities. We therefore recommend—That copies of the proposed by-laws set out in Appendix I. to this report be sent to the London sanitary authorities pursuant to section 114 of the Public Health (London) Act, 1891.

The recommendation was agreed to. The following is the appendix referred to:—

By-laws made by the London County Council under section 39 (1) of the Public Health (London) Act, 1891, with respect to water-closets, earth-closets, privies, and receptacles for dung.

1. The occupier of any premises shall cause every water-closet belonging to such premises to be thoroughly cleansed from time to time as often as may be necessary for the purpose of keeping such water-closet in a cleanly condition.

2. The occupier of any premises shall once at least in every week cause every receptacle for dung belonging to such premises to be emptied and thoroughly cleansed.

Provided that where two or more lodgers in a lodging-house are entitled to the use in common of any water-closet, or receptacle for dung, the landlord shall cause such water-closet to be cleaned, or receptacle for dung to be emptied and cleansed as aforesaid.

3. The owner of any lodging-house shall, subject to the provision hereinafter specified, provide and maintain in connexion with such house, water-closet, earth-closet, or privy accommodation in the proportion of not less than one water-closet, earth-closet, or privy for every twelve inmates of such house.

Provided that proceedings shall not be taken against the owner of any lodging-house for an offence against the last-mentioned requirement of this by-law unless and until the owner, after service upon him of a notice in writing by the sanitary authority, requiring him within such reasonable time as is specified in the notice to comply with the by-law, has failed to comply with the by-law within the time so specified.

4. For the purposes of this by-law, a "lodging-house" means a house or part of a house which is let in lodgings or occupied by members of more than one family.

"Landlord" in relation to a house or part of a house which is let in lodgings, or occupied by members of more than one family, means the person (whatever may be the nature or extent of his interest) by whom or on whose behalf such house or part of a house is let in lodgings or for occupation by members of more than one family, or who for the time being receives or is entitled to receive the profits arising from such letting.

"Lodger" in relation to a house or part of a house which is let in lodgings or occupied by members of more than one family, means a person to whom any room or rooms in such house or part of a house may have been let as a lodging or for his use or occupation.

5. Nothing in this by-law shall extend to any common lodging-house.

Penalties.

6. Every person who shall offend against the foregoing by-law shall be liable for every such offence to a penalty of 5*l.*, and in the case of a continuing offence to a further penalty of 4*0s.* for each day after written notice of the offence from the sanitary authority.

7. Provided, nevertheless, that the court before whom any complaint may be made or any proceedings may be taken in respect of any such offence may, if they think fit, adjudge the payment as a penalty of any sum less than the full amount of the penalty imposed by this by-law.

Repeal of by-law.

8. From and after the date of the confirmation of these by-laws, the by-law numbered 26 (twenty-six) in the by-laws relating to water-closets, earth-closets, privies, ash-pits, cesspools and receptacles for dung, and the proper accessories thereof in connexion with buildings, which were made by the London County Council on June 22, in the year 1893, and were confirmed by the Local Government Board on June 23, in the year 1893, shall be repealed.

OPERATING THEATRE, CHESTER INFIRMARY.—A new operating theatre has been opened at the Chester General Infirmary. The structural arrangements have been carried out by Messrs. T. M. Lockwood and Sons, Chester.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A SCOTTISH meeting of the Association of Municipal and County Engineers was held at Glasgow, on Wednesday, July 27. The object of the meeting was to complete formally the amalgamation of the Scottish Association with the Incorporated Association of Municipal Engineers, thus welding the municipal engineering profession into a united association.

Mr. W. Weaver, Kensington, presided, and there were present—Messrs. E. G. Mawbey, Leicester; J. Price, Birmingham; J. Cochrane, Glasgow; C. H. Cooper, Wimbledon; H. Sileock, Mansfield; A. H. Campbell, East Ham; W. V. Anderson, Winchester; M. J. Buckley, Dublin; R. J. Wolfenden, Bootle; A. A. Turrill, Elgin; W. B. Madin, Rushden; W. Hall, Great Crosby; W. G. Leaves, Great Crosby; F. J. Rayner, Newhaven; W. Dawson, Leyton; J. Trumble, Forest Gate; H. B. Williams, Workington; D. Ronald, Falkirk; —Massie, Falkirk; R. S. Anderson, Peebles; J. Parker, Hereford; R. H. Dorman, Armagh; J. Stones, Sedgfield, Durham; A. H. Nathaniel, Glasgow; W. Bruce, Edinburgh; A. H. Goudie, Stirling; G. W. Lacey, Oswestry; G. G. Shepherd, Ilford; G. W. Tutley, Edinburgh; J. R. Lunsden, Kirkealdy.

The Chairman said, although he was not President at the present moment, the President who was elected and installed at Shrewsbury a fortnight ago had kindly allowed him to take the chair in order that he might welcome the Scottish members coming into the fold of their association. He, Mr. Davis, had left that duty to him inasmuch as he virtually initiated the movement that they were completing. On behalf of the Association he begged to tender to the Scottish members who had amalgamated with their Association a hearty welcome to their ranks, and he trusted that the amalgamation which they effected might be to the advantage of all the members who were joining. He was quite sure personally that it was to the mutual interests of all the members holding appointments throughout Great Britain to be in touch one with another, both for the object of mutual improvement and mutual support, and he trusted that in the future events would prove the wisdom of their action. He, therefore, begged to give them a hearty welcome, and to express his own personal feelings of pleasure in meeting them.

Mr. McDonald (Glasgow), on behalf of the Scottish Association of Municipal Engineers, which had now ceased to exist, begged to acknowledge the very kind observations that the Chairman had been pleased to address to them, and he cordially acquiesced and thoroughly believed in the accuracy of his anticipations that the amalgamation would be of mutual benefit. He was quite sure that the strong current of Scottish blood which was to be infused into the English association could not fail to be otherwise than advantageous, and as the period was far too remote for the memory of any man to remember any such thing as racial difference, he was quite sure they would all benefit from the closer relations which would exist with their professional confrères. He hoped that the associations now combined by amalgamation in enhanced usefulness would prove of the highest benefit to the profession, and that they would all avail themselves of the opportunity that now lay before them of attending meetings of the Association of Municipal and County Engineers.

The Chairman said the next business was the election of an honorary district secretary. Mr. Dyack, of Aberdeen, the present secretary, who was unable to be present, was not prepared to continue in office. It, therefore, rested with the Scottish members to elect someone from their ranks, who they thought would be a fit and proper person to fill the office. Of course, the member who was elected to discharge the duties of secretary for the Scottish district by virtue of that office became a member of the Council of the Association.

Mr. J. Pritty (Selkirk) proposed the re-election of Mr. Bryce, of Partick, as honorary secretary for the Scottish district.

Mr. Massie seconded the nomination of Mr. Bryce. He had been a friend of the Scottish Association from its inception, and if Mr. Bryce could see his way to accept the office, he was the right man in the right place.

Mr. Bryce said he would have preferred if someone else could have taken this matter up,

as he was looking forward to some relief at this period.

The Chairman said he was quite sure if Mr. Bryce would take the office upon himself, at any rate for a year, while things were getting into working order, that the members would be well served. It would be a wise act on their part to elect Mr. Bryce, who had taken a considerable interest in the amalgamation, and with whom he had had considerable correspondence. If he would take upon himself the duties of the office he was sure they would be efficiently discharged.

The proposition was carried unanimously.

Mr. Bryce thanked them very much for the honour they had conferred upon him, but he must say he accepted it only on condition that he got relieved next year. He took the opportunity of giving a year's notice of his resignation.

Building By-Laws in Scotland.

Mr. Bryce, Partick, asked permission to make a statement about building by-laws in Scotland. This matter was so urgent that he thought that was a very fitting time to bring it up. The Scottish surveyors of 1903 very well that in the new By-Laws Act of 1903 they had got authority to frame very comprehensive building by-laws for new buildings and drainage. He thought the list of them was more comprehensive than what was provided for by the model by-laws in England, but he might be wrong on that point. He thought that was the time to appoint a committee of their Scottish members to frame a uniform code of by-laws in respect of Scotland. It was quite true there were a great many local differences which would necessitate the alteration of the by-laws for particular towns, but on the main points the by-laws could be made uniform and adapted to Scottish practice. He need not inform their English friends that their by-laws were practically of no use to them. They knew that in England they were also looking into the matter of their by-laws, and making improvements on the model by-laws, so probably they might get some hints from them in this matter. There was also the question of the form of the by-laws as well as the uniformity. There had been a good deal of discussion lately about by-laws being too fixed, definite, and stringent in their specification. He remembered reading the evidence given before the Glasgow Housing Committee last year, and some of the witnesses made very strong objection to the Glasgow building by-laws on that ground.

The question would arise as to the best form in which to mould the by-laws. He might be wrong, but he thought, in addition to the deliberations of the Glasgow Housing Committee, they might be assisted by the views of the Royal Institute of British Architects and the Surveyors' Institution, as well as the Borough Officials' Association of Scotland, and the National Plumbers' Association. It seemed to him that they had a clear field before them, as they had no model by-laws in Scotland. Therefore they had to take this opportunity of appointing a committee and framing a model code for the Scottish boroughs. If this proved to be the feeling of the meeting, he was prepared to suggest a committee. He moved that a Committee of Scottish members be appointed to draft a code of model by-laws.

Mr. Holmes, Govan, seconded the proposition. The Act of 1903, which came into force in May, required the framing of by-laws. He thought a general code of by-laws was very necessary, because where they had separate boroughs joining up to each other very often troubles arose, and there were difficulties as to house drainage and the trapping of drains. If all the boroughs in Scotland could be induced to adopt a uniform system of by-laws it would conduce to the benefit of all.

Mr. J. Price, Birmingham, speaking as a member of the By-Law Committee of the Council of the Association, thought the Scottish section would be very wise in adopting the procedure proposed by Mr. Bryce, of drafting their own by-laws and not waiting until the Local Government Board or some other Government Department made them for them. Unfortunately that was what had happened in England. The Local Government Board made the by-laws, and they had had to suffer for them ever since. They were now trying to frame a set of by-laws which would be workable, which was more than could be said of those which had been used in the past. In making the by-laws it was well to make them sufficiently wide in scope, and yet not too wide to be ultra

wires. They did not want to be too stringent as to buildings, all they needed was to make the walls sufficiently stable, the roofs tight, and the drainage satisfactory. To do more than that was to go beyond their purview. He thought the movement the Scottish members were promoting that day was one eminently in their interests.

The Chairman then put the resolution, and it was carried unanimously.

Mr. Bryce, Partick, then proposed that the following form the committee: Messrs. Kellop, Perth; Lee, Paisley; Turnbull, Greenock; Holmes, Govan; Young, Ayr; Ronald, Falkirk; Goudie, Stirling; Wilson, Helensburgh; Wenning, Bronghty Ferry, and Lumsden, Kirkealdy. He explained that, as the by-laws would not affect Glasgow, Aberdeen, and Edinburgh, he had omitted the engineers of those cities.

Mr. Holmes, Govan, seconded the proposition, which was carried.

On the proposition of Mr. J. Parker, Hereford, a vote of thanks was accorded to Mr. Dyack for his services as secretary of the Scottish district, and votes of thanks were also accorded to Mr. W. Weaver for presiding, and to Mr. McDonald, of Glasgow, for his services as President of the now Amalgamated Scottish Association.

NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS.

The annual summer meetings of the National Federation of Building Trades Employers of Great Britain and Ireland opened at Scarborough on the 26th ult. Meetings of the Council, which were private, took place morning and afternoon at the Grand Hotel, which was the headquarters of the Federation during its visit to Scarborough.

In the middle of the day the Federation was formally welcomed to the town by the Mayor, Councillor W. Morgan, who, attended by the Deputy Mayor (Councillor J. Sinfield), met the master builders in the Council Chamber at the Town Hall.

Alderman W. H. Jessop, of Huddersfield, President of the Federation, acknowledged the welcome.

A banquet was held in the evening at the Grand Hotel. Mr. E. Good, President of the Yorkshire Federation, presided, and there were in all about 170 guests.

Mr. J. Dawson, of Huddersfield, in proposing "The National Federation of Building Trades Employers," said the credit, he believed, belonged to Lancashire for establishing the Federation, and in a few months Yorkshire followed suit. It was a success from the first, and to-day they held the respect of the officials of the men's union. He believed there would be fewer strikes in the future, because of the respect they had inspired. They intended to have fair play; they did not want anything that was wrong; they only wanted fair dealing, to be treated respectfully, and to have freedom to carry on their business.

Alderman W. H. Jessop responded. Councillor Green, of Liverpool, proposed "The Mayor and Corporation of Scarborough," and Councillor Morgan and Councillor J. Sinfield responded.

Mr. C. H. Barnsley proposed "The Architects and Engineers," and referring to the proposed statutory registration of architects, said, as practical men, they would respect and admire more than ever the profession whose members were able to combine skill of construction and business methods with the abilities of the artist.

Mr. F. A. Tagwell (Scarborough) replied. Mr. W. Shepherd proposed "The Yorkshire Federation of Building Trades Employers." He said they heard a great deal about the decision of the House of Lords in the Taff Vale and other cases, but he ventured to think that these decisions had been led up to by minor cases. The Hull case and the Halifax case were fought with a persistency creditable to any association or federation which might have undertaken them, and in his opinion the persistency with which those cases were fought had helped just as much to elicit the judgments lately given as anything possibly could have done.

The Chairman replied, and said the Council that afternoon adopted the Yorkshire scheme, which had for its object a closer union between employer and employed. They hoped to bring those Heathish practices of strikes and lock-outs to an end.

The health of Mr. Poynton, President of the South African Federation, was proposed by Alderman Bowen, and Mr. Poynton replied.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS.—The annual report of the Sheffield Society of Architects and Surveyors states that upon the completion of the seventeenth year of the Society's existence, the Council has pleasure in recording the sustained interest in its work shown by the attendance of members at the ordinary monthly and intermediate meetings, and by the influence which it has exerted in connexion with public matters affecting the interests of the profession, and particularly by the attendance of the younger members at the classes and lectures. The Council regrets to have to record the death of Mr. W. F. Hemmell (Fellow). The total number in each class is now three hon. members, 35 Fellows, 42 Associates, 17 students, and 20 lay members, total 117, as compared with 109 last year. With regard to public matters affecting the interests of the profession, the time of the Council has been fully occupied during the year. No further action has, to their knowledge, been taken with regard to the new building by-laws, and the Town Clerk has promised that the Society shall have further conference with the Highway Committee when the matter is again considered. The proposed competition in connexion with the Corporation building scheme at Winebank, referred to at the last report, has been carried out, but upon the facts being put before the assessor and the Council of the R.I.B.A. by the Council of the Society, the assessor appointed refused to act, and the R.I.B.A. sent out a circular to its members and to members of allied societies asking them not to compete. In consequence of this an assessor was appointed by the City Council who was not a member of the R.I.B.A. or the allied societies, and the Corporation accepted a design which does not comply with their own building by-laws. The Council deeply regret the action of the Corporation in this matter, as by violating the established traditions of architectural practice they made it impossible for members of the R.I.B.A. or the allied societies to compete, and consequently the city lost the benefit of much valuable experience. In consequence of repeated representations made to it by various members of the R.I.B.A., the Council of that body has appointed a Special Committee to report upon the question of architectural work done in Corporation offices. The Master Builders' Association have recently again opened the question of the contract agreement form. The matter is still under the consideration of the Council, who will report to the members of the Society in due course. The statement of accounts shows that the Society has a balance in the bank of 24l. 16s. 7d.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—A visit was made by the President, Mr. D. B. Butler, and members of the Society of Engineers, on Wednesday, the 27th ult., to the Shipbuilding and Engineering Works of Messrs. Yarrow and Co., at Poplar, where they witnessed the building and engineering of light-draught high-speed craft of all kinds, notably torpedo-boats, destroyers, and light-draught gunboats. The main workshop consists of four bays, each 360 ft. in length. There are two engineers' shops, 50 ft. and 36 ft. wide respectively; a light machine shop, a heavy machine shop, a pattern-makers' and a joiners' shop, together with a large boiler-makers' shop and an extensive shipbuilding department. At the entrance to the works is a fine suite of offices, including a large, well-lighted drawing office. Electrical driving has been adopted in the works, the main motive power being supplied by three Belliss and Morcom compound condensing engines, which drive three Parker dynamos direct, each dynamo being capable of an output of 430 amperes at 210 volts. Steam is supplied by three Lancashire boilers. Over the boiler-house is a cast-iron tank in which is a Ledward evaporative condenser. The drainage from the main roofs is collected in the tank, and is used for condensing purposes, an economy in the use of the town water thus being effected. Most of the machine tools in the various shops are of the latest pattern, and are placed in groups, each line of shafting being driven by its own motor. The shafting is 3 in. in diameter, and runs at 140 revolutions

per minute. The larger machines, which are not continuously at work, are driven by independent motors. The shops are fitted throughout with electric travelling cranes made by Messrs. Adamson. The air-compressing machinery is also driven electrically, a very complete pneumatic system being laid down throughout the works. There are arrangements for delivering compressed air on board vessels in course of construction on the river bank. The principal tools are fitted with pneumatic hoists. There is also a complete installation of hydraulic plant, which has been specially designed for the construction of the Yarrow water-tube boiler. Electric lighting is partially used in the establishment, the current being produced by the same dynamos that supply power; the circuits, however, are kept separate. The shops are all heated by steam which is taken from the main boilers, and the various departments are all in telephonic communication. These new works, which give employment to about 1,200 men, are of such capacity and so advantageously arranged that Messrs. Yarrow are enabled to carry out on the same premises nearly the whole of the operations connected with the building and engineering of the vessels they construct. The whole of the plant and machinery is of the newest type, and so laid down and arranged that they afford every facility for convenience in the execution of work and punctuality in its delivery. Upon the occasion of the Society's visit the members found the works generally in a state of considerable activity, and they inspected a number of boats of various types in all stages of construction.

THE JUNIOR INSTITUTION OF ENGINEERS.—The summer meeting of the Institution this year is to be held in Germany, Dusseldorf being the first stopping place. Here at the Town hall on Saturday, August 13, the members are to be welcomed into the Fatherland by the Burgomaster and the Society of Architects and Engineers of Dusseldorf. The Exhibition will be visited, and on Monday there will be an excursion to Oberhausen for viewing the works of the Gutehoffnungshütte (blast furnaces, steel works, etc.). The Beurather Crane Works will also be seen. On Tuesday the Elberfeld-Barmen mono-rail suspended railway is to be inspected in the morning, and in the afternoon the members proceed to Hanover for the purpose of visiting on the following day Messrs. Korting Brothers' Works, the Hanover Engine Works, and the works of the Westinghouse Brake Company. Thursday morning will be spent at Hanover, and in the afternoon Berlin will be reached. Here on Friday the overhead and underground railway will be seen, including car sheds, generating station, etc., also the Charlottenburg electrical engineering works of Messrs. Siemens and Halske. Saturday, August 20, will be spent in visiting the Mariendorf works of the Imperial Continental Gas Association and the Royal Technical High School at Charlottenburg. The members leave Berlin on the Monday for Leipsic, remaining there till Wednesday, when they go on to Frankfurt-on-Main to visit on Thursday and Friday, by invitation of Mr. W. H. Lindley, M.Inst.C.E., the municipal works, with an excursion to Homburg. On Saturday, August 27, the return journey to England will be made to include the Rhine from Breibich to Bonn.

COMPETITIONS.

OSSETT TOWN HALL.—The scheme for the erection of a town hall, municipal offices, and borough court on a site in the market place was considered by the Ossett Town Council at a meeting of the General Purposes Committee on the 27th ult. The thirty-three sets of competitive plans which had been received were reported upon by Mr. John Kirk, of Dewsbury and Huddersfield, the assessor appointed by the Council, and on his recommendation the plans submitted by Messrs. Hanstock and Sons, of Batley, were selected. The town hall is to cost 12,000l., exclusive of the site, which has been purchased at a cost of 5,500l.

STAMFORD FREE LIBRARY.—We have been asked to give publication to the following letter, which has been addressed to the competitors:—

"Town Clerk's Office, Stamford,
25th July, 1904.

BOROUGH OF STAMFORD.

FREE LIBRARY.

DEAR SIR,—My attention has been called to the fact that several of the competitors have not received

proper information herein. From time to time circular letters have been written by me to the competitors entering the competition and instructions given by me to a clerk to send the necessary details to every competitor. I now find, much to my surprise, that a number of the competitors have not received all the information.

The Chairman of the Free Library Committee has therefore, under the circumstances, agreed to further extend the time within which the plans are to be sent to me; therefore the time will be extended, in order to give each competitor an opportunity of entering the competition, until the 10th day of September next.

If you have not received a block plan and instructions please let me know by return of post and the same will be sent to you.

Further, if you have already sent in your designs for the Free Library Building the same will be returned to you, if you so desire, in order that you can spend the extended time upon them.

I enclose a circular letter written by me on the 2nd June last.

Yours faithfully,
CHARLES ATTER,
Town Clerk."

BOOKS RECEIVED.

PROPERTIES OF BRITISH STANDARD SECTIONS. Issued by the Engineering Standards Committee. (London: Crosby Lockwood and Son, and Offices of Committee, 28, Victoria-street, S.W. 6s. net.)

HADDON HALL. By F. H. Cheetham. (London and Manchester: Sherratt and Hughes, 2s. 6d.)

TIMBER. Edited by Paul N. Hasluck. (Cassell and Co. 6s.)

BOOK-KEEPING FOR BUILDERS. Edited by Paul N. Hasluck. (Cassell and Co. 6d.)

THE STANDARDS OF FIRE RESISTANCE OF THE BRITISH FIRE PREVENTION COMMITTEE. (London: Offices of the British Fire Prevention Committee, Waterloo-place, Pall Mall.)

BUILDERS' HOISTING MACHINERY. Edited by Paul N. Hasluck. (Cassell and Co. 6d.)

TECHNOLOGICAL AND SCIENTIFIC DICTIONARY. Edited by G. F. Goodchild and C. F. Tweney. (London: George Newnes, Ltd.)

HANDY NEWSPAPER LIST, 1904. (London: C. and E. Layton. 6d.)

THE INSURANCE REGISTER. (London: C. and E. Layton. 1s.)

"RED BOOK" ON ADVERTISING. (London: F. E. Coc. 2s. 6d.)

Correspondence.

A TWOFOLD IMPROVEMENT.

SIR,—One of the finest sites in London is at present occupied by the most hideous of churches—that is to say, Pentonville.

One of the best churches in the City, at present quite useless, is buried behind the Mansion House. If this church—St. Stephen's, Walbrook—were taken down and removed to replace Pentonville church, it would be seen from many points in the City and suburbs.

The City and Corporation would gain greatly by such an improvement, for the site of St. Stephen's, together with the adjoining churchyard, would provide quite a decent-sized garden for the Mansion House.

The garden could be approached by means of a steel balcony, crossing the Mansion House passage, accessible from the Egyptian Hall, and descending by means of light steel staircases. I think that if the attention of the Corporation and of the authorities of Clerkenwell could be called to consider this matter, there would not be much difficulty in carrying out this improvement. WALTER SCARGILL.

WANDSWORTH BATHS COMPETITION

SIR,—I have been invited by the Council of Wandsworth Borough to submit a design in competition for proposed new public baths, to cost 4,500l. Twenty-two other architects have also been similarly honoured. Assuming that each architect spent in time and money 20l. on his design, the net out-of-pocket expenses would be rather more than double the amount of commission that the successful competitor would receive. It will be interesting to see how many of the twenty-three architects invited enter into the struggle for this vast commission. The conditions have been drawn up by the assessor, appointed by the Council, and, evidently in a spirit of gentle irony, it is stated that no competitor may submit more than one set of drawings. As these are to consist of four plans, two elevations, two or three sections, 1/4-in. details, etc., it is doubtful if such a clause to check "vaulting ambition" is really necessary. If the Council, under their by-laws, had to go to competition, surely it would have been better to make it an open one. There are many clever assistants who would have submitted quite creditable schemes, and who would have found (on paper) that the proposed expenditure of 4,500l. was more than sufficient to carry out

the work in the "best possible manner." It is only when the tenders come in that optimism receives a rude awakening!

NON-COMPETITOR.

The Student's Column.

NOTES ON PORTLAND CEMENT:

CHAPTER IV.—PHYSICAL PROPERTIES AND DETERMINATION.



ALTHOUGH the testing of cement has been engaging the attention of chemists, engineers, and manufacturers for many years, as yet no entirely satisfactory system has been proposed which will eliminate the personal equation of those who make the tests, a variation which renders the results inaccurate. On account of this personal error the endeavour should be to obtain apparatus and appliances to reduce it to a minimum.

Sneaton, in trying to determine the value of cements, placed balls made of them in water, thus showing their hydraulic properties.

Vicat devised an apparatus to measure the amount of penetration of a needle into a mass of the gauged cement, the amount of penetration being proportional to the hardness. A modification of this apparatus is now used to determine the setting time. A common early method of testing the cementitious value was to stick bricks together with the cement under examination, one at a time projecting horizontally from a wall. The cement which held the greatest number of bricks was considered the best. In this test no distinction was made between quick and slow setting cement, so that the former was adjudged superior. In 1830, six years after Aspdin took out letters patent for his Portland cement, Pasley, from his experiments, endeavoured "to lay down rules for judging the quality of cement offered for sale, and for ascertaining whether it has been adulterated or not, by attending to which the most inexperienced person may easily detect such frauds in twenty-four hours or less." Considering our present difficulties in cement testing, Pasley's statement, "that rules have been laid down by which their comparative strength may be judged of experimentally and in a short space of time, such as ten days, with very little trouble and the greatest accuracy," is very amusing. Pasley's method of testing the strength of mortars was to stick two bricks together with them, and, after allowing a certain time for hardening, he suspended them from a tripod, a pair of clamps fixed on the upper brick and a similar pair on the lower one, and, attaching weights thereto, noted the weight required to pull the bricks apart. He also ascertained the time required for cement to harden under water.

In 1858 John Grant, Engineer for the London Metropolitan Board of Works, began his well-known tests for Portland cement. He was the first to introduce definite methods, and he devised a machine for testing tensile strength. Later, Fajja showed the importance of testing the soundness of cement, and devised an apparatus for the purpose. Michaelis devised a short-lever machine; Fajja also introduced a similar one. The development of methods of testing came slowly after Grant set the pace and Michaelis and Fajja had improved and extended them.

Different committees and associations formulated rules, which served their purposes for the time, but, with the more general use of cement and the introduction of specifications, new methods had to be introduced and old ones improved on. A great deal of work has been done in this way by the German Association of Cement Makers, by the commission appointed by the French Government in 1891, and by the various conferences of the international association for testing materials. With this short *résumé* of the development of cement testing, it is proposed to consider the different tests and methods now in use in detail. As the majority of cement tests are made by mixing the sample under examination with water, and moulding into briquettes, blocks, pats, etc., it would be well to consider first of what consistency the paste for these should be, for on this depends the results obtained.

The paste should be of a normal or standard consistency, but, as nearly every operator has a different idea of what a stiff plastic paste should be, this consistency varies greatly.

At the Charlottenburg testing laboratories

the percentage of water to be used is obtained by mixing the sample to a syrupy paste, so that it will run from a spatula in long thin threads without forming lumps. Representing the quantity of water to produce this condition by N, then the percentage of water W required for normal consistency is obtained by the

$$\text{equations } W = \frac{N + 1}{2} \text{ for neat tests, and } W = \frac{N + 3}{4} \text{ for sand tests (three parts sand.)}$$

one cement). This gives a suitable paste for use with the Boehme Hammer apparatus, and is nearly of the same consistency as is the most general practice in this country. Another method in use in Germany is to make a paste to fill the mould of Vicat's needle apparatus, replacing the needle with a rod 1 c.m. in diameter, and weighted with 300 grammes. The penetration of the rod to a certain point gives the percentage of water required.

Some testers, again, prefer to use the minimum quantity of water—that is, just sufficient that, after beating the cement paste into the moulds, enough moisture rises to the surface to enable the cast to be faced with a trowel or spatula. In America the general practice is to mix rather wet, so the paste can be kneaded with the hands. Although none of the methods are entirely satisfactory, that as practised at the Charlottenburg laboratories might be universally adopted, as, when carried out in a proper manner, the most uniform results can be obtained. Numerous mechanical contrivances have been devised for mixing the cement into the required paste, but the objections to them all are that the cement tends to ball and it is difficult to tell when the mixing is complete; while quick-setting cements often begin to set during the mixing. To hand gauging the operation is fully under control, and the experienced operator can tell by the appearance of the paste when the mixing is completed. The author finds a very thorough mixing can be done in a large porcelain mortar, using care not to grind the cement particles. The mixing should always be done on some non-absorbing, non-corrosive surface, such as plate-glass, slate, or marble, otherwise water will be absorbed from the paste, rendering it drier than intended, and so materially affecting the results. The cement or mortar should be thoroughly mixed till the water is distributed evenly through the particles. In Germany the custom is to mix slow-setting cement three minutes, and quick-setting one minute, but the experienced operator tells from the appearance when the cement is sufficiently mixed. Should the paste begin to stiffen during the mixing the cement has begun to set, and should be thrown away, making another trial with more water. The addition of water to a paste which has begun to set must not be resorted to, as this would destroy the crystallisation of the cement compounds. Whatever forms the mortar is moulded into, care must be taken to keep them moist during setting, the hardening being a chemical change and entirely dependent on the water used in mixing.

The casts should be preserved in moist air or covered with a damp cloth, keeping it from coming in direct contact with them, otherwise the cloth may dry out and absorb water from the cast. A damp box is the most suitable arrangement, and the temperature can be kept even.

Having worked the cement into a suitable paste, the next step is to determine its various properties. In valuing a cement one of the most important, and in many cases the only test it is subjected to is the determination of its strength. The setting of cement is the change from a fluid to a solid state. When it has set, the process of hardening has commenced.

The relative degree of hardness is measured by determining its compressive, adhesive, or tensile strength.

In this country the compressive test is seldom done; in Germany it is always done along with the test for tensile strength.

For compression tests the specimens are usually 2-in. cubes. The machine in which they are broken should not be of large capacity, since the friction, which increases with the load, has an influence on the results, especially on cubes tested at short periods. Usually the compressive strength is eight to ten times the tensile strength. The chief point requiring attention in testing for compressive strain is that the weight is distributed evenly over the

OBITUARY.

Mr. MITCHELL.—We have to announce the death, on July 21 after a long illness, of Mr. W. E. Mitchell, aged forty-four years. Mr. Mitchell was a member of the firm of Messrs. William Henry Mitchell, Son, and Gutteridge, of No. 9, Portland-street, Southampton, architects. Of the more principal works carried out by his firm we may instance the Royal Southampton Yacht Clubhouse, Above Bar, Southampton (Mr. W. H. Mitchell) the Infants' School, Totton, near Southampton; the Board Schools at Eastleigh, Hants; the boiler-house, chimney-shaft, etc., South Stoneham Union Work-house, at West End; the school buildings in Ludlow-road, Woolston; the decoration, with repairs, improvements, new pulpit, etc., of the Congregational church at Freemantle, Hants; the town hall and offices, with fire-station, stables, men's quarters, etc., for the District Council of Eastleigh, for which they won the first premium in competition; the Crown Hotel, Lyndhurst; Taunton's Trade Schools, Southampton, opened in March, 1899; the workhouse infirmary, for about 300 patients, at Shirley Warren, for the Guardians of the Poor of the Southampton Incorporation (1900-2), Mr. A. F. Gutteridge being, we believe, mainly responsible for the preparation of the plans and designs as architect of the building; drainage and other works at West End, Southampton, for the South Stoneham Board of Guardians; St. John's Mission Hall, in French-street, and the Highfield Hotel, in Church-street, Southampton; the schools in the High-street, Pear Tree Green, for the St. Mary Extra United District School Board, Hants; additions, with new classrooms, etc., to the Harley University College, Southampton; and the recent improvements, with iron fire escape, staircase, and bridge, and so on, at the Southampton Workhouse for the Guardians.

GENERAL BUILDING NEWS.

ST. PATRICK'S CATHEDRAL, ARMAGH.—The Roman Catholic Cathedral of St. Patrick has just been consecrated by the Papal Legate, Cardinal Vannutelli. St. Patrick's Cathedral stands on a very high eminence at the approach to the City of Armagh. It faces the approach to the City, and stands on an ancient Cathedral, which also stands on an eminence, and was commenced in the year 1840. The work of rearing the cathedral was continued slowly, and, in the end, with considerable alterations in the original plans. In its completed form the building is cruciform in plan, comprising nave, aisles, and transepts, with chancel and choir. The total length in the clear is 212 ft., the internal length 208 ft., the breadth across the transepts 120 ft. The length of the nave is 114 ft., the length of the chancel 60 ft., and breadth of nave and chancel 75 ft. The transepts are 41 ft. by 34 ft., and the choir is a square of 38 ft. The external roof is 100 ft. in height, the internal one 81 ft. The two western towers and spires rise to a height of 210 ft., and are surmounted by 10-ft. crosses. The crossing of the roof where the transepts intersect the nave is supported by four arches 80 ft. high by nearly 40 ft. wide. The principal entrance is on the west end, comprising a large central doorway and two smaller flanking doorways in the towers. There are also auxiliary doorways in the transepts, a doorway which originally opened under the east window in the chancel wall having been filled up on the erection of the Lady altar. The entrance from the sacristy is in the same chancel wall, between the Lady altar and St. Joseph's altar in the northern aisle. The building has a seven-terraced flight of steps, 225 ft. long, leading from the entrance gates to the piazza that fronts the western doors. In the interior there are some fine mosaic decorations on the walls. The subjects are very diverse, many being Irish themes, such as St. Brigid founding her monastery at Kildare, but Biblical subjects have also been availed of. The great attraction is the crossing where the high altar stands, the six spandrels of which, over high arches, are inlaid with mosaic figured subjects in gold and colour, representing "The Good Shepherd," "The Resurrection," "Christ and Magdalen," and "The Ascension." The one facing towards the nave contains a picture of St. Patrick converting and baptising the Irish. The subjects of the decoration of the ceilings are incidents in the lives of the Irish saints, from St. Patrick to St. Laurence O'Toole. The panels contain pictures of many of the saints, prophets, and patriarchs. For the marble work about thirty different types have been used. The Gothic high altar, which stands against the rood screen in the crossing, is executed in statuary marble. The front contains a panel group, after Leonardo da Vinci, by the Roman sculptor, Signor Cesare Aureli. Two years and more Professor Aureli devoted to this work. It is

an alto-relievo presentation, in white statuary marble of Carrara, of Leonardo da Vinci's "Last Supper." The pulpit is the work of Signor Medici, of Rome. It stands against the main south-western pier at the crossing. The work is carved and resplendent with inlays of various old marbles. The width of the body of the pulpit is over 6 ft., and the plinths and cornice stones are all got out in solid marble blocks. The plan is octagonal, with angle niches containing figures of the four Evangelists, St. Patrick, and St. Brigid; the canopies above these statues being ground and carved. The panels between the niches are filled with tracery and inlaid marble. The Stations of the Cross take the form of fourteen plaster statuary groups in alto-relievo, resting on semi-circular pediments, springing from the wall level, and ornamented with Gothic foliated tracery and flowers. Behind each group a Gothic arched and moulded panel forms a background, having in its upper portion a small inlet in quatrefoil shape for the reception of the wooden cross necessary for the attachment of the indulgences of the Via Crucis. There are nineteen stained-glass windows. The architect was Mr. C. J. McCarthy, of Dublin.

RENOVATION OF PETWORTH PARISH CHURCH.—The parish church of St. Mary, Petworth, has been reopened after alteration. After inspection of the building, a report on the fabric was drawn up and prepared by Mr. C. E. Kempe, with whom was associated Mr. Walter E. Tower, architect; and Lord Leonfield undertook to bear the expense of the restoration of the whole of the nave, aisles, and the north chapel, which is dedicated to St. Thomas of Canterbury.

CONGREGATIONAL CHURCH, EPSOM.—The foundation-stones of the new Congregational Church in Church-street, Epsom, were laid recently. The building will accommodate about 500 people, the dimensions of the main building being 80 ft. by 37 ft. The fabric will be of Corsham Down stone with red brick facings, and at the front will be a square tower, with a spire 70 ft. high. There will be a main entrance leading into a vestibule, an entrance beneath the tower, and a side entrance. The flooring will be of wooden block, the seating in Orham wood, and the roof of open timber. There will also be a west end gallery to seat eighty people. Two vestries are provided for at the rear of the chapel. The lighting will be by electricity, and the heating on the low-pressure system. The architects are Messrs. T. Gregg and C. Stapley, and the builders Messrs. Cropley Brothers.

ADDITIONS TO THE GRAMMAR SCHOOL, DRAX, NEAR SELBY.—The foundation-stone was recently laid of the new wing which is being built on to the grammar school at Drax. The work is being carried out from the designs of Mr. Thomas S. Ullathorne, architect, Selby, by Messrs. Jackson and Dunberline, builders, Goole.

ENLARGEMENT OF BURNTWOOD OLD SCHOOLS, STAFFORDSHIRE.—The memorial-stone for the enlargement of the Sunday schools connected with the old schools at Burntwood was laid recently. The new buildings comprise a schoolroom, 57 ft. 6 in. by 25 ft. 5 in., and two classrooms, 18 ft. by 16 ft., giving accommodation for 300 children, in addition to the 150 children provided for in the old schools. The work has been placed in the hands of Mr. Robert Harris, builder and contractor, Sheffield. The new buildings have been designed by Mr. H. E. Lavender, architect, Walsall, and are of brick.

WORKHOUSE EXTENSIONS, YORK.—At a meeting of the York Board of Guardians on the 21st ult., Mr. Snaith moved that sanction be given to the proposal of the Building Committee to erect a new tramp ward and nurse quarters, and the motion was ultimately carried. It was resolved that Mr. J. H. Morton, architect, South Shields, be appointed to carry out the work.

CONSERVATIVE CLUB, SUTTON-IN-ASHFIELD.—The memorial-stone was recently laid at Sutton-in-Ashfield of a new Conservative club, on a site centrally situated in Portland-square. Mr. F. P. Cook, of Mansfield, is the architect of the new premises, and the contract has been secured by Mr. J. Greenwood, of Mansfield, the estimated cost being 1,500l. The building will be of brick, with limestock facings and stone dressings. The main entrance will face Forest-street, and on the ground floor there will be the billiard-room, with accommodation for two tables, a smoke-room 14 ft. by 13 ft., and serving bar, with direct communication to the billiard-room. The club-room upstairs will be 42 ft. by 28 ft. Accommodation for a caretaker will also be provided.

FIRE STATION, ARDYOYNE.—The new branch fire station, which has been erected at Ardoyne, by the Council of the County Borough of Belfast, was opened on the 27th ult. The building is Georgian in style,

KING'S COLLEGE, LONDON:

LIST OF PRIZE WINNERS, 1903-4.

DIVISION of Architecture (day school).—History of Architecture—1st division, H. Niemann Smith, silver medal. Studio—1st year, W. Hoyle, 1l. in books. Building Construction—2nd year, 1st division, H. Niemann Smith, 1l. in books; 1st year, 1st division, W. Hoyle, 1l. in books. Faculty of Arts:—Division of Architecture (evening)—1st division, W. H. Judges, 1st prize; W. Fern, 2nd prize. Sketching Class—S. Ixer, prize. Quantities—Chas. C. Blomfield, 3l. in books; Alex. W. Percival, 2l. in books; Wm. F. Foster, 1l. in books. Constructional Drawing—W. J. Burton, silver medal; G. Winteringham, 3l. in books; E. F. Wicks, 2l. in books; J. Perkins, 1l. in books. Building Construction—Wm. F. Foster, silver medal; A. W. Percival, bronze medal; W. J. Burton, 1l. in books; E. A. Townsend, 2l. in books. Sir George Faudel Phillips' bronze medal for Sanitary Building Construction—W. H. Judges.

WESTMINSTER CITY COUNCIL.

The usual meeting of this Council was held on Thursday last week, at the City Hall, Charing Cross-road, W.C.

Hoborn to Strand Improvement.—The General Purposes Committee reported that they had caused a representation to be made to the London County Council that, in consequence of the very great loss of rating to the City of Westminster through the large tracts of land at present unoccupied on the route of the above improvement, the County Council should immediately consider such other conditions of agreement for the disposal of such land as would permit the land to be occupied on equitable terms. The action of the Committee was endorsed.

South African War Memorial.—On the recommendation of the same Committee it was agreed to consent to the erection of a memorial to the officers and men of the Royal Artillery who fell in South Africa, in Waterloo-place, opposite the Guards' memorial.

Middlesex Guildhall.—The report of the Works Committee contained a recommendation, which was agreed to, to permit the Middlesex County Council to alter the building-line in Little George-street, at the rear of the Guildhall.

Victoria Station Enlargement.—On the recommendation of the Committee, it was agreed to authorise the City Engineer to issue a licence for the erection of a hoarding on Eccleston Bridge, in connexion with the enlargement of Victoria Station, on the application of Messrs. Maxwell and Co.

Wardour-street Widening.—On the recommendation of the Improvements Committee it was referred to the Law and Parliamentary Committee to consider and report on the advisability of promoting a Bill in Parliament to authorise the Council to carry out the widening of Wardour-street.

COURT OF COMMON COUNCIL.

The usual fortnightly Court of Common Council was held in the Guildhall, E.C., on Thursday last week.

By-laws with regard to Closets, etc.—The Sanitary Committee submitted a copy of by-laws under the City of London (Various Powers) Act, 1900, with respect to water-closets, earth-closets, ashpits, cesspools, etc. The City Seal was affixed to the copy of the by-laws.

Removal of the "Obelisk," St. George's-circus.—On the recommendation of the Bridge House Estates Committee, it was agreed to consent to the erection of a clock-tower on the spot now occupied by the Obelisk, St. George's-circus, on condition (among others) that the Southwark Borough Council re-erect the Obelisk on a spot to be hereafter agreed upon.

The Demolition of Buildings in the City.—A letter was received from the Local Government Board enclosing the by-laws made by the Court on March 24 last, sealed and confirmed by the Board.

CHURCH, ROOKHOP, DURHAM.—The foundation-stone has just been laid of a new parish church for the village of Rookhope. The architects are Messrs. Carrol and Passmore, London, and the builder, Mr. Wm. Hall, of Gateshead.

and the outer elevations are in red brick, relieved with white Scotch sandstone dressings. The interior walls throughout are of bricks, plastered with cement dado. The roofs are covered with Welsh Countess slates. The contractors for the building were as follows:—Mr. Hurcheson Keith, builder; Messrs. James Loudon and Co., plumbers and gasfitters; Mr. Stanley Johnston, electrician; Messrs. Musgrave and Co., Ltd., stable fittings; Mr. Thomas Foy, automatic door fittings; and Messrs. Young and Mackenzie, architects.

THE ROWTON HOUSE, DOG BANK, NEWCASTLE-ON-TYNE—It is proposed to erect this building in Dog Bank, at the foot of Pilgrim-street. The plans have been passed by the Town Improvement Committee, and the scheme has the approval and support of the Corporation. The plans have been prepared by the architect, Mr. J. C. Maxwell. The building has a frontage of 162 ft. on the Dog Bank, sloping to the east, and a mean height of 74 ft.

BANK PREMISES, BRISTOL—The new premises of the London and Provincial Bank, Ltd., No. 3, Clare-street, were opened on the 2nd inst. The building is of Doubling stone, with polished granite base, and is in the later Renaissance style. Messrs. Oatley and Lawrence were the architects, Messrs. R. Wilkins and Sons being the contractors, and the carving was done by Mr. Gilbert Seale, London.

MINERS' HOMES, BACKWORTH, NORTHUMBERLAND—The chief corner-stones for the seventh colony of cottages in connexion with the Northumberland Aged Mine-Workers' Homes Association were laid recently at the West Allotment, near Backworth. The cottages are being built by Mr. G. Burdiss, contractor. Costing £10,000, from the plans of Mr. T. Tulip, Chop-lington.

THEATRE, LIVERPOOL—The Queen's Theatre, Paradise-street, Liverpool, has just been opened. From floor to ceiling the house has been reconstructed. Seating accommodation is provided for 2,000 people within view of the stage. Eight boxes on the stalls and circle level each accommodate six persons. The stage, 27 ft. wide, 26 ft. high, and 53 ft. long, has been reconstructed, and fitted with a freepiece curtain. Mr. J. H. Havelock Sutton was the architect engaged, the builders being Messrs. Holme and Green.

APPOINTMENTS.

KING'S COLLEGE, Mr. Arthur Stratton has been appointed lecturer in the Architectural Division of King's College, London, in succession to Mr. C. H. Reilly, and Mr. Ronald P. Jones has been appointed assistant lecturer to Mr. Stratton.

SANITARY AND ENGINEERING NEWS.

GOSPORT AND ALVERSTOKE MAIN DRAINAGE.—Gosport and Alverstoke are situated on the western side of Portsmouth Harbour. The whole district comprised in the area to be drained is very flat, the greatest difference of level being 22 ft. The difficulty of draining the district is increased by its peculiar conformation, there being no less than four creeks which penetrate the district—viz., Forton Lake, Haslar Lake, Workhouse Lake, and Stoke Lake; therefore, before considering the general details of the scheme to be adopted, it was first necessary to consider how and where the sewage should be dealt with—viz., whether the creeks should be used as outfalls, or whether there should be one main outfall into the sea. The creeks are left dry at low water, exposing a large surface of mud, which, owing to the sewage at the present time being discharged into the creeks, is in a very offensive state. The lowest portions of the district are on the borders of these creeks, and are separated from each other by intervening ground at a higher level. A sea outfall was selected for the following reasons:—A higher state of purity in the effluent would be required if discharged into the harbour than would be necessary if discharged into the open sea. Furthermore, the creeks being left dry at low water, the outfall sewers would have to be taken to the mouths of the creeks. The iron sewers required to carry the effluents to low water would cost a very large sum. A septic tank would be required for each of the four outfalls. Furthermore, the land required for each of the four tanks would be very difficult and costly to obtain. After examining the shore, the deep-water channels, and set of the tides, the point selected for the outfall is near the western boundary of the district. The flatness and low-lying nature of the district to be drained, rendered a pumping scheme necessary, but the waterlogged nature of the ground rendered the deep sewers necessary for a central pumping station impossible. The present population is between 27,000 and 30,000; the prospective population is taken at 40,000. The volume to be dealt with is as follows:—From rainfall, 650 cu. ft. per min.;

from sewage (twice the average flow), 267 cu. ft. per min.; total to be dealt with in tanks, 897 cu. ft. per min.—say 900 c.f.m., 1225 c.f.m. per person, 202½ gallons per day per person. The outfall fittings are the sewage at the eighteen different points are Shoue's ejectors, in duplicate, at each station, supplied with air from air compressors in duplicate at a central station in Westfield-road. The sewage is treated in septic tanks before being discharged into the sea, but there are no contact beds, as the effluent is discharged into the sea. Briefly, the works consist of, for the district:—26 miles of sewers varying in size from 6 in. diameter to 3 ft. diameter, thirteen ejector stations varying in size from 50 gallons to 800 gallons; 2½ miles of rising mains; 7½ miles of air mains; a tank 300 ft. by 75 ft.; two 180 h.p. air compressors. On Government property there are five ejector stations. The whole of the works have been carried out under the supervision of Mr. R. St. George Moore, M.Inst.C.E., of Victoria-street, Westminster, assisted by Mr. Herbert Frost, A.I.M., and C.E. The contractors for the general works being Messrs. B. Cooke and Co., of Westminster, and for the machinery, Messrs. Hughes and Lancaster, of Westminster.

MISCELLANEOUS.

NATIONAL REGISTRATION OF PLUMBERS.—A conference of representatives of the six District Councils for the National Registration of Plumbers in Scotland was held recently in Glasgow. The meeting was convened by the Glasgow and West of Scotland District Council, which took the opportunity of the assemblage of the Sanitary Institute in Glasgow to bring together the representatives of the Scottish councils, some of whom were members of the Institute, for the consideration of various matters connected with the registration movement, including the existing facilities for the education of the young plumber in the theory and practice of his art, the conditions at present prevailing for admission of qualified masters and operatives to the list of registered plumbers, the prospect of Parliamentary legislation, and other matters. Ex-Bailie James Dick presided. On the subject of education, general admiration was expressed at the arrangements which have been made in Glasgow for the works of the Technical College, where, under the supervision of the Scottish Education Department, the theoretical and practical plumbing classes are now under the management of a committee reporting to the Governors, but containing a full representation of the District Registration Council and the plumbing trade. It has further been arranged that the College, as well as the Technical College, an examination, which has been approved by the Scottish Education Department, the District Council, and the Worshipful Company of Plumbers, and the last-mentioned body has seen its way to accept the results of that examination as equivalent to its own. A full interchange of opinion on topics of importance to the movement took place, and, at the conclusion of the conference, Ex-Bailie Crawford reported on the steady and persistent efforts which have been made in promoting the Plumbers' Registration Bill, and the very large amount of Parliamentary support which has been obtained from all quarters. The Bill had more than once passed its second reading in the Commons, and had once passed through all its stages in the Lords; but the excessive difficulty of passing private members' Bills was the chief cause of the disappointing delay in obtaining an Act. On the motion of Mr. James Hyslop, Dumfries, seconded by Dr. Crawford, the conference agreed to place on record its sense of the value of the registration movement and of its advantages to the trade.

Visit of Plumbers to London.—A party of Dusseldorf master plumbers recently visited the metropolis, and devoted a day to craft matters. The arrangements were made by the London Society of Associated Master Plumbers. The new buildings of the Royal London Friendly Society, in Finsbury-square, were first visited, where there was an exhibition of British workmanship. Luncheon followed at which the London representatives were the guests of their German friends. After luncheon, the Guildhall was visited. Having been conducted through the museum, the great hall, and the Council chambers, the party journeyed to Parke's Museum, and here the various sanitary exhibits were studied. Next the Polytechnic was visited, and to conclude the programme, the Dusseldorf masters were entertained to luncheon by the London Society. The Dusseldorf masters have resolved to form an institution in their own country based on the organisation of master plumbers in this country. Messrs. J. J. Rawlings, R. A. Marshall, J. Johnson, and J. Wright Clark conducted the party on behalf of the London Society.

DEVONSHIRE STREET, W.—A memorial-tablet has been affixed against the front of No. 56, Devonshire-street, Portland-place, being the house occupied by Sir John Herschel in 1824. At their meeting on Friday, July 23, the Borough Council of Islington passed, by thirty-six votes to seventeen, a resolution for the adoption of the Free Libraries Acts without a limit of the rate to 1d. It was announced at the meeting that Mr. Carnegie would undertake to defray the cost of the buildings provided the Council would find the site and would levy a 1d. rate.

WAR MEMORIAL, ISLINGTON.—A memorial statue in bronze will be executed by Mr. McKelland to commemorate the ninety-one inhabitants of the borough who fell in the South African campaign. The statue, a female figure symbolical of victory, will follow a design recommended for adoption by Sir E. J. Poynter, P.R.A., and Sir W. Richmond, R.A., and will be erected in Highbury Fields, at a cost of about 800l.

RAMSEY ISLAND, SOUTH WALES.—The Ecclesiastical Commissioners have just sold to Mr. Wynford Philipps, M.P. for Pembrokehire, the island of Ramsey, together with the chapel of St. Justinian on the opposite sea-coast. The chapel forms one of several resort of missionaries and pilgrims in olden days. Its erection is ascribed to Bishop Edward Vaughan (1505-23), who built the chapel, on the east side of the chancel of St. David's Cathedral, wherein he was buried. Ramsey Island has been somewhat fancifully termed the "Iona of Wales," by reason of its ancient association with the church founded by St. David in the Vth century.

SWEDISH GRANITE.—Mr. Schele, British Vice-Consul at Halmstad, writes that about 30 per cent. of the entire export of granite from that district has been lately shipped to the United Kingdom. The price obtained this year is no less than 8s. per ton below that of two years ago. This has caused a severely felt loss to producers, but now, since the price of labour has been considerably reduced and improved methods of manufacture introduced, it is hoped that this export, which is so important both to the port and district, may be maintained and further increased. The local quarrying company having purchased a German patent for shapin granite, a new article for street-paving purposes will be placed on the market for export from Halmstad and from the Lysekil district. The paving sets turned out by these machines are of a smaller size than the ordinary ones, and are specially suitable for streets and road work; their cost and manufacture is about one-third of the manufacture of ordinary paving stones.

THE ABBOT'S HOUSES AT ARBROATH.—Negotiations have been opened between the Arbroath Town Council and H.M. Board of Works for Scotland for the transference from the former to the latter, under the Ancient Monuments Preservation Acts, of the ruins of the Abbot's House, adjoining Arbroath Abbey ruins. Abbot's House is said to be one of the oldest inhabited buildings in Scotland, and King Robert the Bruce and other Scottish monarchs were occasionally entertained there. The basement or sunk floor is the kitchen of the house, and remains just as it was centuries ago, untouched. The masonry is described as being very fine. The wine-cellar is also on the basement floor. The proposed transference has been brought before the Town Council, and is discussed adjourned pending a conference with the representatives of the Crown.

FIRE TESTS OF THE BRITISH FIRE PREVENTION COMMITTEE.—On Thursday last week the British Fire Prevention Committee had a series of testing operations on their Porchester-road testing ground. The tests were attended by Major-General Festing, on behalf of the Council, and several members of the executive, together with a number of public officials from the Government departments, the London County Council and other corporate bodies, the insurance companies, and the fire service. The first test was with a plastic partition under 2½ in. thick constructed by Messrs. Knechtel. The fire was of one and a half hours' duration, the temperature reaching 1,800 deg. F., and water being applied for two minutes. This was a test for the "Partially Protective" class, under the new International Standards of Fire Tests. The partition was the first of its kind to attempt this standard. The second test was with a partition 3 in. thick constructed of a pumice product by Messrs. Cullum. The fire

was for a period of two hours, at temperatures reaching up to 2,000 deg. F., followed by the application of water. This was also for the "Partially Protective" class, under the new International Standards, the extra thickness over 2½ in. being met by the additional time during which the partition was subjected to the test. To attain the "Fully Protective" class a partition must be under test for two and a half hours if under 2½ in. in thickness, or four hours under test if over that thickness. The third test was with sprinklers by the Albion Sprinkler Company, and comprised a systematic series of full-sized and laboratory tests with sprinklers, both dry and wet, relating more particularly to their sensitiveness and their powers of water distribution. The fourth test was with vapour lamps by Petrolite, Ltd. These were lamps in which the vapour is produced from petrol. The tests were mainly in respect to ignition and explosion when upset, broken, etc.

THE PULPITS OF WESTMINSTER ABBEY.—The marble pulpit, which was shown in the Great Exhibition of 1851, and, until lately, stood in a bay of the nave of the Abbey, has been taken to St. Anne's Cathedral, Belfast. It was carved by Wm. Field, after Sir G. G. Scott's designs, and presented in January, 1851, to the Abbey for the Sunday evening services. In its place has been set up the XVth century pulpit, formerly kept in Henry VII.'s chapel, in which, it is said, Craumer preached at the coronation and the funeral of his god-son, King Edward VI. That earlier pulpit, constructed of oak, is of what is termed the wine-glass shape, having six sides and a slender pedestal. Portions of another pulpit, used in the XVIIIth century, have for a long while been stored in the triforium; its successor was removed from the choir in 1827 to the church at Trotterscliffe, near Maidstone, and to that succeeded another which, having been removed to Shoreham, gave place to the marble one mentioned above.

Legal.

CLAIMS FOR REMUNERATION:

HURRELL AND TAYLOR v. AINSCOUGH; MATEAR v. AINSCOUGH.

THESE actions were tried together. The plaintiffs in the first are quantity surveyors, and the plaintiff in the second, Mr. Huon Arthur Matear, is an architect, practising in Liverpool. Both claims were for professional fees and costs on account of work done. Mr. Horridge, K.C., and Mr. Greer were for the plaintiffs, and Mr. Pickford, K.C., and Mr. Keogh for the defendants. It was stated by Mr. Horridge, in opening, that Mr. John Ainscough, who is a miller in a large way of business at Burscough, decided in 1902 to build at that place a residence to cost, including furniture, about 10,000l. Mr. Ainscough at that time lived at Southport. He consulted Messrs. Waring and Gillow, through whom the preparation of the plans was entrusted to Mr. Matear, who is architect of the Assize Courts at York, of the new Liverpool Cotton Exchange, and other buildings. The house at Burscough was to be a first-class gentleman's residence, with a great deal of oak-work about it. Mr. Matear took the matter up, and, as the furniture and fittings were to cost some 2,000l., prepared the plans, about which, as this was to be an artistic piece of work, there was a great deal of detail. Some difficulty, however, arose as to the cost. One part of the defence, said counsel, was that Mr. Matear was told to prepare plans for a house to cost 5,000l., but that, it was now suggested, was an afterthought, because from the correspondence and interviews the idea formed of the cost of the building was roughly 8,000l. To get a close idea of the cost Messrs. Hurrell and Taylor were engaged to take out the quantities, and this was done. Afterwards Messrs. Waring, as contractors, sent in on the basis of the quantities an estimate for building amounting to 7,114l. However, Mr. Ainscough, in a subsequent interview with the building manager of the contractors, said that, as he had lost money on the cora market, he would like the plans modified so as to reduce the cost to 5,000l. This was done, and the estimate was cut down to 5,500l. In June Mr. Ainscough intimated that he had decided not to build, and the business, having gone off, the architect and the quantity surveyors brought these actions to recover their fees, which were, in each instance, 2½ per cent. on the first estimate of cost. The defendant declined to pay, on the ground that, as the matter had fallen through, he was not liable for percentage charges. Mr. Matear, in his evidence, said 2½ per cent. was the usual charge for drawing the plans of a building of this class.

The hearing was adjourned, and the parties subsequently agreed to accept judgment for Mr. Matear for 105l. and costs, and for Messrs. Hurrell and Taylor for 100l. and costs.

CIVIL ENGINEER'S ACTION FOR FEES.

THE case of Robinson v. Cadogan came before Mr. Justice Lawrence, sitting without a jury, in the King's Bench Division on the 1st and 2nd insts.—an action by Professor Henry Robinson, civil engineer, to recover 400l. for professional services alleged to have been rendered to the defendant, Earl Cadogan, in advising him with respect to his opposition to a certain sewage scheme.

The defence was that the charges, which included 10l. 10s. a day for twenty-seven and a half days, for the plaintiff's own services, in addition to charges for his assistants, were excessive and unreasonable.

Mr. C. A. Russell, K.C., and Mr. F. Newbolt appeared for the plaintiff, and Mr. Lawson Walton, K.C., and Mr. J. R. Atkin for the defendant.

Mr. Russell, in opening the case, said that the defendant was the principal landowner in the neighbourhood of Westoe, near Bury St. Edmund's. In 1903 the Corporation of Bury St. Edmund's were about to apply to the Local Government Board for a loan to enable them to carry out certain works in connection with a sewage farm they possessed. That sewage farm had been a nuisance to the neighbouring landowners, and it was important to them that the Corporation scheme should be adequate and efficient. Defendant accordingly was anxious to have advice in the matter to enable him to determine whether he should oppose the scheme or not, and for that purpose he retained the services of the plaintiff. With regard to the defence, the learned counsel submitted that it was impossible for a man like the plaintiff to take up the position of critic without being prepared to suggest a better method of dealing with the sewage. As to the amount of the charges, the learned counsel submitted that, if the defendant employed a gentleman of high standing, like the plaintiff, he must pay the plaintiff's usual and proper fees.

The plaintiff, examined, said he spent the time charged for in preparing his report. His charges were quite usual and recognised for persons in his position.

Cross-examined,

He had formed the opinion that the first scheme was sufficient, but the alternative scheme would be more perfect. His item charges for the report amounted to between 70l. and 80l. only, but the past fee would have been 100 guineas.

Mr. Charles Hawksley, past-President of the Institution of Civil Engineers, and Mr. J. C. Mellis, M.I.C.E., gave evidence to the effect that the plaintiff's charges were reasonable and proper in the circumstances.

The evidence of Mr. Geo. Strachan for the defendant was interposed at this point. He said he had been Engineer to the Borough of Bury St. Edmund's and to advise the Borough of Bury St. Edmund's as to the sewage scheme. He advised a mechanical scheme, costing about 8,000l., and if this was not sufficient, then, in addition, a bacteriological scheme, costing an extra 15,000l. There was no difference of opinion between himself and the plaintiff, except as to whether the whole thing should be carried out as one scheme.

Mr. Keith Robinson, the plaintiff's son and his chief assistant, gave evidence as to the time spent on the work. His time, he said, was charged at 2l. 2s. per day of seven hours.

This being the plaintiff's case,

Mr. Walton, on behalf of the defendant, submitted that the claim had arisen out of a misapprehension on the part of the plaintiff as to the work he was engaged to do. The plaintiff was only asked to come to a conclusion as to whether the scheme of the Bury Corporation would be satisfactory. The plaintiff reported that Mr. Strachan's complete bacteriological scheme was satisfactory, and when the plaintiff had done that he had done all that the defendant required. But the plaintiff went further, and suggested an improvement of his own, and the whole of the account relating to the alternative scheme ought to be struck out. The learned counsel said that, with regard to the plaintiff's report, it would be straining the scale of professional remuneration to put it at 100 guineas.

Lord Cadogan gave evidence to the effect that he did not ask anyone to prepare a special scheme.

Cross-examined,

He directed no inquiries as to what plaintiff's charges would be, as he trusted that a gentleman in the plaintiff's position would charge proper fees.

Mr. M. W. Mortimer, defendant's agent at Culford, said he had not given plaintiff instructions to prepare an alternative scheme.

Sir A. Binnie, Engineer to the London County Council, stated that he did not think,

in the circumstances, it would be usual to prepare an alternative scheme.

This evidence concluding the defendant's case, counsel addressed his lordship, and, in the result, judgment was reserved.

THE ACTON ANCIENT LIGHT DISPUTE:

MANDATORY INJUNCTION GRANTED.

IN the Chancery Division, on the 2nd inst., Mr. Justice Kekewich delivered judgment in the case of Kine v. Jolly, the action by Mrs. Kine, the owner of a house, known as "Woodthorpe," in Accia-road, Acton, against Dr. Jolly, the owner of an adjoining house, claiming a mandatory injunction, or, in the alternative, damages for the obstruction of her ancient lights.

The facts of the case and the evidence were fully reported in the issues of the *Builder* of July 23 and 30 last.

His lordship, in giving judgment, said that the first question was, whether the plaintiff had a cause of action. That question had to be considered on the lines of the recent decision in the House of Lords in the case of the Home and Colonial Stores v. Colls, which laid down a rule admittedly difficult of application, but, in itself, comparatively simple. The Lord Chancellor had said that the question in each case was, whether the obstruction of light amounted to a nuisance which would give a right of action, and Lord Lindley said that the question to be decided was not how much light was left, but whether the plaintiff had been deprived of so much light as to constitute an actionable nuisance. In the present case, that there had been an obstruction of light, sufficient to be felt, was clear and beyond dispute, and that was not contested. But the question was, was it such as to constitute a nuisance, and such as caused a material privation of light for practical purposes for business or occupation, and upon this depended plaintiff's right to maintain the action. At the first trial he was convinced that there had been interference by the defendant's building with the light of the plaintiff's drawing room, and he would thought, although it still remained a well-lighted room, there was some obstruction. He saw no reason now to alter that opinion, but, in accordance with the rule laid down by the House of Lords, he could not deem the obstruction of light to that room to be actionable, and he decided that, taking that room alone, the plaintiff had no cause of action. At the second trial there was put in a new question, viz., whether there had been an actionable obstruction of the light coming to the plaintiff's hall by reason of the defendant's building. The evidence was clear that this part of the plaintiff's house had a considerable amount of light, and, taken alone, he could not regard the obstruction as a nuisance within the meaning of the judgment in the House of Lords. The great cause of complaint was as to the obstruction of light to what had been called the morning room in the plaintiff's house. It was, before the erection of the defendant's house, an exceptionally well-lighted room, and even now was well lighted. The question was whether there was sufficient light left to enable the room to be used for the ordinary purposes of a room of that character? The evidence was that, in houses like the plaintiff's, being a suburban or country residence, the third room on the ground floor, not being the dining-room or drawing-room, was the most used. For the complete enjoyment of such a room good light was essential. That there had been a large obstruction of the light coming to that room by the erection of the defendant's house was abundantly clear, and he thought it was clear that there had been a large interference with the comfort of that room. There had been a considerable body of evidence as to the altered character of that room by reason of the erection of the defendant's house. He was convinced that the character of that room had been altered, and, although it was still a well-lighted room, it had lost, by the obstruction of light, one of its chief charms and advantages. Having given the evidence and all the circumstances full consideration, he had come to the conclusion that the obstruction of the light to the plaintiff's morning-room was a nuisance within the meaning of the authorities on that subject. The plaintiff, therefore, had a cause of action, and the question then was as to what form the relief should take. The plaintiff said that a mandatory injunction should be granted, and that damages would be inadequate for the injury she had suffered. In that his lordship agreed. There was no reason why the court should incline to damages rather than to an injunction. Under these circumstances he thought it his duty to grant a mandatory injunction, and the next point was as to what should be its form or extent. It was argued, on behalf of the plaintiff, that he must regard the nuisance to her house as a whole. He considered that

he must treat the obstruction as to the morning-room, plus the obstruction of light to the hall. He proposed to order the defendant to pull down so much of his house as caused a nuisance to the plaintiff by the obstruction of the light to the windows of the morning-room and the hall, as the same existed previous to the erection of the defendant's house. The defendant must pay the costs of the trial. His lordship said he desired to make these further remarks. The first was that he supposed the defendant might wish to take the opinion of the Court of Appeal on the matter. If he did, full opportunity for this should be given. To enable this to be done he thought the best course was, not to suspend the operation of the injunction, but to intimate, as he did, that no application to enforce the order would be regarded as proper so long as an appeal from his decision, presented with reasonable diligence, was pending. Should the defendant appeal, he suggested that the plaintiff's solicitors should not at present tax their costs; but if they did they must give the usual undertaking to refund the costs paid by the defendant if his appeal succeeded. His lordship said, in conclusion, he wished to offer this advice both to the plaintiff and the defendant. He had said that, in his opinion, damages were not an adequate remedy for the injury the plaintiff had suffered. They were, however, a partial remedy, and he thought the plaintiff would be well advised if the defendant offered it, to accept a substantial sum as compensation, and so put an end to the expenses of further litigation.

On Wednesday, the 3rd inst., Mr. Hughes, K.C., mentioned the case to the Court of Appeal, composed of Lords Justices Vaughan Williams, Romer, and Cozens-Hardy. The learned counsel said that he appeared for the defendant, and the previous day Mr. Justice Kekewich had granted the plaintiff a mandatory injunction. The case had previously been before this court, when he (Mr. Hughes) appeared for the defendant, Dr. Jolly. When the appeal was opened, his learned friend, Mr. Lawrence, who had represented the plaintiff in the court below, said that, having regard to the decision of the House of Lords in the case of the Home and Colonial Stores v. Colls, he could not support the judgment as it then was. It was said that Mr. Justice Kekewich had really misdirected himself. Their lordships then took the view that the matter must go back to Mr. Justice Kekewich for re-trial, and reserved the question of costs. The matter had now been back to the learned judge, and he had, as before stated, granted the plaintiff a mandatory injunction. Their lordships, when the case was last before this court, had stated that, if possible, the matter should be again brought before them during the present sittings in order that it might be disposed of while the court was constituted as at the present moment. The defendant not only desired to appeal from the original order, but also from the judgment delivered on Tuesday, granting the plaintiff a mandatory injunction.

Lord Justice Romer said that the defendant could only appeal from the final decision. Mr. Hughes supposed that would be so, as the original judgment of Mr. Justice Kekewich was discharged, the Court of Appeal reserving the question of costs.

Lord Justice Romer: You must appeal in the usual way. There is no reason why the appeal should be advanced.

Mr. Hughes: If your lordships think that the appeal should take its ordinary course, so be it.

SWINDON ANCIENT LIGHT DISPUTE.

THE hearing of the case of Cook v. Wm. McIlroy, Ltd. concluded before Mr. Justice Warrington, in the Chancery Division on the 28th ult., an action by the plaintiff, Mr. E. J. Cook, a pastrycook and confectioner, of Regent-street, Swindon, against the defendants, drapers, of Havelock-street, Swindon, for a mandatory injunction to restrain the obstruction of plaintiff's ancient lights. There was also an alternative claim for damages.

Mr. Norton, K.C., and Mr. Church appeared for the plaintiff, and Mr. Rowden, K.C., and Mr. G. Lawrence for the defendants.

Mr. Norton, in opening the case, said that the plaintiff claimed a mandatory injunction and damages, and the question was which he was entitled to. The only point at issue was whether or not the defendants' building was a nuisance to the plaintiff by depriving him of the access of the light to which he had been accustomed. Mr. Cook was the freeholder and occupier of Nos. 72 and 73, Regent-street, Swindon, at the corner of Havelock-street and Regent-street, and the premises consisted of a shop facing Regent-street and a book-shop, now vacant, with a window facing Havelock-street. There was a dwelling-house over both shops, and that portion in the plaintiff's occupation faced both Regent and Havelock

streets. The windows of his sitting-room and a room used as a nursery faced Havelock-street, and it was these rooms which were most injuriously affected. Plaintiff's premises extended 95 ft. down Havelock-street. The windows of the sitting-room and nursery had always been in the same condition and position since the premises were purchased by Mr. Cook's father in 1856. Previous to the erection of the defendants' new building plaintiff enjoyed a considerable amount of sunlight and had a view of nearly a mile. On the opposite corner of Havelock-street and Regent-street, for as long as the plaintiff remembered, there was a grocer's shop and dwelling-house of about the same height as the plaintiff's building. The slope of the roof faced towards his building, and the wall from the pavement up to the eaves was about 17 ft. high. The premises were purchased by the defendants and pulled down by them in the autumn of 1903, and defendants then commenced building operations on the site of the old buildings extending for about 90 ft. along Havelock-street. Plaintiff first complained on April 21, 1904, but at that time the defendants were putting up their building in skeleton; that was merely the iron girder framework, as was the case with modern buildings, so the light was not interfered with very much; but as the defendants began to fill in the brickwork it sensibly diminished the plaintiff's light. On April 30 Mr. Cook again complained, and defendants admitted that what they were doing interfered with his light. On May 4 the plaintiff, finding that the light of his sitting-room, nursery, bakehouse, and workrooms was being interfered with and daily diminished issued a writ for an interim injunction. The matter came before Mr. Justice Buckley on motion, and he directed that the action should be tried at once without pleadings, and giving the defendants liberty to pay 500. into court as damages, with a denial of liability. Plaintiff said it was often impossible to use his sitting-room for office work and book-keeping, as he did before, and the light in his bakehouse and workrooms had been sensibly diminished. The light in the lock-up shop had also been reduced, but he made no claim with regard to that. There was a tower at the corner of defendants' building which further obstructed the light.

The plaintiff was called and generally bore out the opening statements of counsel. He said he bought the premises from his father's trustees about six years ago for 3,000., and had spent about 400. in improving them and making the corner shop into a lock-up shop.

Cross-examined. The business was not so good as it was previously, as there was now a good deal of competition. He kept three men, two boys, a domestic servant, and a nurse.

Mrs. Julia D. Cook, wife of plaintiff, stated that since the erection of the defendants' building their sitting-room was absolutely useless for any purpose but a bedroom.

Mr. Ellis Herbert Pritchett, an architect and surveyor of Swindon, examined, said he had made the model which was being used to show the elevations. Defendants' building on every floor projected nearer Regent-street than the old buildings which formerly stood on the site, and was very much higher. The angle of light to the plaintiff's sitting-room was formerly 60 deg. to 64 deg., now it was only 33 deg. to 37 deg. The diminution was very much the same with regard to the nursery window. In his opinion there was no doubt that plaintiff's premises had been very greatly affected by the erection of the defendants' premises at a distance of 31 ft. 9 in. Plaintiff's sitting-room was very dark at the back, and it now would only get a small proportion of sunlight during the summer and would be very dark in the winter. In his opinion the deprivation of light to the plaintiff's premises was so great as to constitute a nuisance to the plaintiff. It had depreciated the selling value of the plaintiff's property to some extent, which he had not calculated. Mr. Thomas Bell Silcock, an architect and surveyor, gave it as his opinion that the letting value of the plaintiff's property had been considerably depreciated, the residential portion as much as 50 per cent.

Mr. Chas. Bishop, an auctioneer and surveyor, said that the letting value of the plaintiff's premises had depreciated by the obstruction of light caused by the defendants' building.

Cross-examined. He did not agree that the erection of the defendants' building had improved the letting value of the plaintiff's premises and of the adjoining property. At the close of the plaintiff's case Mr. Chas. Bell Silcock, architect and surveyor, was called. He said he had inspected the plaintiff's premises. The sitting-room was well lighted and bright enough for all ordinary purposes, and he could read very small print at the back of the room with his back to the window. There

was plenty of light coming between the gables and the defendants' building, and the angle of light was not at all bad for town buildings. The bakehouse was also bright enough for all ordinary purposes.

In cross-examination the witness admitted he had not seen the plaintiff's premises before defendants erected their building. He did not think there had been any depreciation in the letting or selling value of the plaintiff's premises owing to the erection of the defendants' building.

Several witnesses were called, who said that the erection of the defendants' building improved the plaintiff's property.

Mr. James Dunham, one of the managing directors of the defendant company, examined, said that the contract price for their building was 15,000., and the fixtures and fittings another 1,000. In round figures the site cost 6,000.

At the conclusion of the defendants' case Mr. Norton, in reply to his lordship, said Mr. Cook did not want to be unneighbourly, and if his lordship decided in his favour, he would be content with damages, and would not insist upon defendants' building being pulled down.

His lordship remarked that he was glad to hear that, because it relieved him of a difficult question which might have had to be considered on account of the building having been allowed to go on to the condition in which it now stood.

In giving judgment, his lordship said that, when he came to consider the angles of light now existing in comparison with the light which formerly existed, there was no doubt that the loss of light was very considerable indeed, especially with regard to the plaintiff's sitting-room and nursery. What he had really to consider was laid down by the House of Lords in the case of the Home and Colonial Stores v. Colls—namely, whether the obstruction complained of was a nuisance, and if, by the erection of the defendants' building, the plaintiff had suffered substantial deprivation of light sufficient to make the occupation of the house uncomfortable and prevent the plaintiff carrying on his business on the premises as beneficially as he had formerly done.

As to the sitting-room, it was a small room, lighted by one window with a south-easterly aspect, and it was used by the family as their only sitting-room. The plaintiff also used the room for the keeping of his books, and it was used for meals and so on. Then there was the loss of light to the nursery and bakehouse. His lordship having referred to the evidence, said he came to the conclusion that, as far as the sitting-room and the nursery were concerned, the effect of the defendants' building had been to render the occupation of the rooms uncomfortable and was sufficient to be regarded as a serious injury to the plaintiff in his occupancy of the house. He held, therefore, that the plaintiff had a good cause of action. He now had to decide what relief the plaintiff was entitled to. If the building had not been erected he thought, under the circumstances of the case, he would have granted an injunction, because he thought there was really an injury, and it was doubtful whether it could be compensated for by money. But the defendants' building was erected to a height of 42 ft. before any complaint was made, and at the date of the issue of the writ it was practically complete. He might have had considerable difficulty if the plaintiff had pressed for an injunction. Plaintiff had, however, said he would not do so, and, that being so, the only question he had to consider was as to what damages he ought to award to the plaintiff for the injury he had suffered. After considering all the evidence, he came to the conclusion that the plaintiff was entitled to 500. damages, and he entered judgment for him for that amount with costs. Order accordingly.

ACCIDENT THROUGH A DEFECTIVE BALCONY.

THE case of Tredway v. Machin came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 23rd ult., on the application of the defendant for judgment or new trial on appeal from verdict and judgment at trial before Mr. Justice Grantham and a common jury in the King's Bench Division. The case was reported in the *Builder* of April 2 last.

The action was brought to recover damages for personal injuries sustained by the plaintiff owing to the non-repair of premises let by the defendant to the plaintiff's husband. The defendant, who was tenant of No. 15, Sidmouth-street, W.C., under a repairing lease granted in October, 1902, sublet the first floor unfurnished to the plaintiff's husband in December, 1902, upon a weekly tenancy at 10s. 6d. a week. On August 8, 1903, the plaintiff stepped out on to a balcony in front of the window of her room, and the balcony gave

way, causing the injuries of which she complained. The plaintiff, in her evidence at the trial, stated that she did not know that the balcony was unsafe, but had pointed out to the defendant the places of the cement which covered the stonework of the balcony was defective. She further said that the defendant had to do the repairs to the premises. There was no written agreement between the plaintiff's husband and the defendant, and it appeared from the evidence that the defendant had done repairs to the premises to the extent of 200l., which included the putting right of something wrong with the balcony, to which the plaintiff had called his attention, and that the repairs were inspected and passed by the lessor's surveyor. At the trial the jury awarded plaintiff 150l. damages, and judgment was entered accordingly. The defendant now appealed on the grounds that there was no evidence of any contract by the defendant with the plaintiff's husband to do repairs; that he was only liable to his own lessor to do repairs; and that there was no evidence of notice to the defendant of any defective state of the balcony.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, said he would assume that there was an obligation to repair on the part of the landlord, but on the cardinal point in the case, the evidence was all one way—viz., that no one suspected the existence of any such defect in the balcony as to render it unsafe. The defendant, being under an obligation to his own lessor to repair, carried out certain repairs in accordance with a specification prepared by the lessor's surveyor. A slight defect in the balcony was pointed out, consisting merely of a want of plaster; but no one knew of the indication of any structural defect. No notice of the defective state of the balcony having been given to the defendant, he thought the application should be allowed, and judgment entered for the defendant.

The Lords Justices concurred.

Mr. A. J. Ashton and Mr. W. C. Clay appeared for the appellant, and Mr. Cranrot for the respondent.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

16,053 of 1903.—LOCKEBIE and WILKINSON, LTD., and J. M. LOCKEBIE: *Coin-freed and Indicator Locks.*

A coin-freed and indicator lock, by which, after the insertion of the coin, the indicator is operated and the coin slot closed by the action of the outside handle, in combination with a bolt-plate connexion by which, in case of the interior handle having been accidentally operated, the action of bolting the door again reverses the indicator and closes the coin slot.

16,722 of 1903.—A. BROOKER: *A Combined Spirit Level, Plumb, and View Finder for Photographic, Artists', and General Use.*

This consists in the combination, in one portable instrument, suitable for carrying in the pocket, or affixing to cameras and other articles, of a view selector, a horizontal spirit level, and plumb, so constructed that it will test vertical and perpendicular lines.

17,940 of 1903.—M. WEBER and CLATWORTH and Co., LTD.: *Mechanism for Adjusting to and Setting at Variable Angles the Backs of Seats, and the like.*

Back frames for settees, couches, and the like, having the end posts pivotally mounted, and having locking bolts adapted to lock in racks fitted in the end posts, the locking bolts being forced to locking position by springs attached to pivoted arms connected by chains, or the like, to an operating lever, whereby the locking bolts can, at will, be withdrawn from engagement with the racks, thus enabling variation in angle of inclination of the back frame, relocking taking place by rebound of the springs on return of the operating lever.

18,796 of 1903.—G. R. URE and T. MCGROTHER: *An Adjustable Roof Flange or Nozzle for the Smoke Pipes of Stoves, Ventilating Pipes, and such like.*

An adjustable roof flange, comprising in combination a plate with a dome and a nozzle, said dome having grooves and nozzle projections, the nozzle being fastened to the dome by a bolt-and-shot arrangement, and being provided with a removable ring or washer.

19,610 of 1903.—A. M. LAMBERT: *Partition Walls.*

This invention relates to the construction of partition walls with slabs formed of suitable materials, being comparatively thin in

section with relation to the area of the faces of the slab. An essential feature consists in forming the pattern or design upon one or both sides of these slabs, and with them building up a partition wall in such a manner that no further ornamentation is required upon the surface, and by this means a partition wall is formed having ornamental surfaces on both sides, and requiring no additional ornamentation whatever, although, if desired, the whole may be painted, or certain portions may be picked out in the desired colours, or the slabs may be formed in the first instance with a glazed surface in any well-known manner.

19,707 of 1903.—S. EWART: *Baths.*

A sheet-metal bath having pockets or loop holes, and set screws with which said pockets or loop holes are fixed on the bottom of the bath for the purpose of receiving and holding in position the legs of the bath.

20,032 of 1903.—R. CRANE: *Fire Grates and Stoves for Occasional Use as Cooking Ranges.*

A cooking range, consisting of an oven under the fire, with a space between for air and the ascending fire blocks on each side, with slots for the descending flues, also at the back with a slight recess for the shifting plate, and fire bars in front, flue passages, which are inclosed on the outer sides with cast-iron pieces properly framed, and which are also continued under the oven before they ascend the back flue, the entire top surface of the fire being covered with cast-iron in two or more pieces, and the top of the front bars being likewise covered by a removable door.

20,593 of 1903.—W. H. LUTHER: *Roofing, Skylight Windows, Side-Lights, and the like.*

According to this invention the frame is secured round the top, and two sides of the rectangular or other opening cut in the corrugated iron or other roofing or part of the building. Each part, or side of the frame would be made of one piece, and be formed of a "double thickness, kneed, projecting, out-flanged shape," and have the inner part "kneed outwards at end as a midfeather," to form one side of a channel, while the outer part would be kneed out parallel with same to form the other side of the channel, and then bent backwards at end and doubled round and secured to the roof. The channel thus formed between the "kneed" parts of ends of plate would have inserted within it a packing of rope, or other fibrous or like material, over which the sheet of glass would be placed.

23,129 of 1903.—W. CALWAY: *Construction of Portable Buildings.*

A portable building, cement, stone, or similar slabs supported at their edges in grooves formed by wood-external members, in conjunction with external cappings and internal strips fastened to said frame members.

256,876 of 1903.—C. M. SCOTT: *Sash Balancing Devices.*

A combined sash hanger and lock, consisting of a spindle, mounted in a bracket, and carrying a clock spring and a pinion with a circular groove in its side, containing holes adapted to be mounted behind a pulley style of a window and opposite a rack or an adjacent side rail, so that pulling the upper sash down, or raising the lower sash, as the case may be, will wind up the spring, and a spring pin, adapted to pass through the inside window facer, and engage in one of said holes, so as to lock the sash.

1,235 of 1904.—J. WHITE: *Apparatus for Releasing Drop Curtains, and the like.*

An apparatus for releasing drop curtains, and the like, consisting essentially of a bell-crank lever, pivoted to a batten, from which is suspended the curtain or like, by operating which bell-crank lever a pin can be withdrawn from holes in two eyes attached to the batten, and from a hole in a hanger by which the whole is suspended.

6,157 of 1904.—C. NOVAK: *Locks or Latches for Doors, Windows, and the like.*

A right and left handed lock for doors, windows, etc., having a bolt reversible around its longitudinal axis, a gear for regulating the stroke of said bolt, allowing, after being put out of gear, of the bolt being pushed in to the lock case for the purpose of being reversed.

10,535 of 1904.—F. BOHNE: *Means for Locking Folding Doors, and the like.*

A means for automatically locking folding doors and windows, comprising a spring-operated bolt, in the shape of a two-armed lever, notatably arranged on a horizontal pivot, a tapered or rounded head at each end of the bolt, said heads projecting into the path of the two sides or wings of the door or window, a metal line recess in the upper surface of the top transverse bar of one of the wings for

the reception of the larger bolt-head, and a metal plate on the upper surface of the top transverse bar of the second wing for pressing back the second bolt head and turning the bolt accordingly.

12,742 of 1904.—A. HENDEL: *Ventilating Apparatus.*

An automatic ventilator, consisting of separate dampers or light material (mica, or the like), so hung in a frame that, when a current of air in one direction is produced either by difference of temperature or by artificial means, the respective dampers will automatically open outwards, and when a contra current of air is produced, the dampers will automatically close.

12,776 of 1904.—L. PEARCE: *A Holder for Window Sashes.*

A vertical sash holder, consisting of a drop pawl formed with a heel and button piece, and held and pivoted in a casing secured to the window, said pawl being in operative engagement and combination with a ratchet, whereby the window is retained in any position.

12,787 of 1904.—J. PORLENZ: *Casters.*

A caster in which the vertical swivel pin is attached to the lower surface of the socket, and engages or enters a recess in the roller-bearing block in such a manner that the lower surface of said socket and the upper surface of said block make contact with each other.

12,909 of 1904.—P. JAEGER: *Roll Shutters.*

A roller shutter having bands drawn through it, in which these bands are made impervious to the action of weather by their being saturated with a substance, such, for instance, as resin, tallow, or the like, before the roller shutter is made up, which substance has the property of being very fluid under heat, and becoming solid when cold, so that a thin elastic and water impervious coating is formed round the separate fibres of the bands, which prevents the bands altering in length, that is to say, contracting by the absorption of water and stretching on drying.

19,108 of 1903.—J. E. LEACH: *Gully Traps, and the like.*

This invention relates to certain improvements in the gully trap, or similar drain trap as described in the specification to Patent No. 17,593 of 1900, and its object is to allow of the cap therein described as forming part of the seal being removed for the purpose of cleaning out the gully, or similar vessel, without affording a free passage for sewer gases, or the like. This is accomplished by placing underneath the trap, as described, a "teapot" trap, or the like, either as a separate casting, or as part of the gully or similar vessel, so that when the cap of the uppermost trap is removed, the gases from the sewer cannot escape, being prevented from doing so by the "teapot" trap.

19,151 of 1903.—S. H. ADAMS: *Manhole and Inspection Covers.*

The use of a lever or levers in combination with a manhole, or other cover, said lever or levers serving to separate the cover from its frame, or to serve as a lock to hold both together.

20,648 of 1903.—P. DUCHEMIN: *Hooks or Supports for Carrying Slates, Plates, or Tiles on Roofs.*

A support for square tiles or slates, consisting of three points of support for the lower point of the tile or slate, formed by a bent wire or strip having a vertical part, the upper part of which forms a spring hook embracing the batten of the roof, its lower end being bent down laterally to form one of the supporting arms, then bent across the front to form a bridge piece, and finally bent up laterally to form the other supporting arm, its end meeting the vertical part.

24,249 of 1903.—A. TOUSSAULT and E. A. FRADET, L. PIDEFFERT (trading as Toussault, Fradet, and Cie.): *An Introducer for Crematorium, and other furnaces.*

An introducer for crematorium, and other furnaces, comprising a trolley or wagon, adapted to run on rails, carrying a girder, or pair of girders, considerably overhanging or projecting beyond the front end of the trolley or wagon, by means of levers having hingo or pin connexions to the girder, or girders, and the trolley or wagon on which they are carried, and provided with means for raising and lowering said girder, or girders.

218 of 1904.—C. VON FORELL: *A Process for Manufacturing Cement from Slag.*

A process for manufacturing cement from slag, in which slag granulated by water, and mixed or not with powdered slag, is submitted to an oxidising flame, to just below the point of fusion, whereupon the whole burnt mass is suddenly cooled by a dry process, and finally powdered.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

7,205 of 1904. C. VON RIMANÓCZKY: Stage Structures for theatres, and other places, for Preventing the Spread of Fire.

A stage structure for theatres, and other places, characterised by the stage being connected by means of openings provided in the rear wall, and closeable by plates or doors, with suitably-high towers, for the purpose of producing such a strong draught as to cause the products of combustion, in the event of a fire, to be drawn from the stage through the door into the open air.

12,013 of 1904. T. ZIMMERMANN: Means for Strengthening Scaffold Boards, Planks, and the like.

This invention relates to cleats for scaffold boards, planks, and beams, which can be driven into the wood. These cleats are formed of separate S-shaped sheet-metal pieces, which are driven into the wood, so that the bent ends of adjacent pieces hook one within the other.

12,354 of 1904. J. HASKE: Apparatus for Moistening the Air of Rooms and Enclosed Spaces.

A humidifier, comprising a pan, a trough, superposed upon said pan, a set of elements of absorbing material, supported upon the edge of said trough, a goose neck formed on each of said elements on the upper part thereof, and adapted to almost touch the bottom of said trough, the lower portion of said elements extending into said pan.

12,518 of 1904. W. L. WATSON: Material and Composition to be used for Damp-courses in Building, for Covering Roofs, the Surfaces of Bridges, Viaducts, Arches, Sewers, and the like, for Preventing the Access of Damp to Iron Girders, and the like, for the Insulation of Electrical conductors, and for other purposes of like kind.

A material for damp-courses used in buildings, consisting in the combination of a continuous layer or sheet of lead, with a coating upon both sides, said coating consisting of a mixture of bitumen, powdered pumice stone, and oil, and outside this mixture a coating of asphaltic felt.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

Table listing property sales with columns for date, agent, location, and price. Includes entries for Hoddesdon, North Tawton, Yellohills, Yeo Farm, Essington Farm, etc.

Table listing property sales with columns for agent, location, and price. Includes entries for Broome-hy-Bow, Poplar, Hornchurch, Walsworth, Hawkwell, etc.

Table listing property sales with columns for agent, location, and price. Includes entries for Belgravia, Hyde Park, Maida Hill, etc.

By SIMMONS & SONS.

Enfield.—Park-ter, f.g. rents 522. 10s., reversion in 83 yrs. £1,300

Bronley-by-Bow. — Devon's-rd., f.g. rents 127. 12s. reversion in 58 yrs. 305

204 and 206, Devon's-rd., ut. 58 yrs., g.r. 8s., yr. 80l. 690

288, Devon's-rd. (s.), f., cr. 35l. 255

304, Devon's-rd. (s.), ut. 96l. yrs., g.r. 6l., yr. 46l. 18s. 340

39, Tidy-st., f., w.r. 36l. 8s. 330

14 and 15, Weston-st., f., w.r. 66l. 6s. 500

35, Glancus-st., f., w.r. 28l. 12s. 250

Bow.—82, Campbell-rd., f.g. yrs., g.r. 5l., w.r. 46l. 16s. 355

4 to 12 (even), Swaton-st., ut. 58 yrs., g.r. 18l. 15s., w.r. 184l. 12s. 1,235

46 and 48, Rounton-rd., ut. 58 yrs., g.r. 7l. 10s., yr. 78l. 550

Canning-town.—330, Barking-rd. (s.), f., yr. 50l. 620

Notting Hill.—4, Paraday-rd., ut. 60 yrs., g.r. 2l. 10s., w.r. 64l. 6s. 425

Kennington.—73, Lower Kennington-lane, e., yr. 44l. 330

Enfield.—1 to 5, Maude-villas, ut. 75l. yrs., g.r. 19l. 18s., w.r. 184l. 12s. f.g. 800

19l. 18s. reversion in 75l. yrs. 800

South Lambeth.—43 and 45, Heyford-av., ut. 83 yrs., g.r. 17l. yr. 119l. 12s. 795

By J. A. & W. THARP.

Bethnal-green.—11, Winchester-st., f., w.r. 32l. 10s. 215

Lepton.—61, Sophia-rd., f., w.r. 22l. 2s. 165

14, Carlisle-rd., f., w.r. 19l. 10s. 350

Leptonstone.—59, Lancaster-rd., f., w.r. 35l. 2s. 145

32, Gosley-rd., ut. 1 of an acre, f., w.r. 30l. 300

Stoke Newington.—89, Midway-gr., ut. 45 yrs., g.r. 6l. 10s., yr. 40l. 900

Victoria Park.—2 to 9, Windsor-rd., ut. 61l. yrs., g.r. 32l. 10s. 700

Habit Town.—17 to 20, Marshfield-st., ut. 30l. yrs., g.r. 18l., w.r. 102l. 14s. 410

July 29.—By C. H. BROWN.

Milico.—14, Chichester-st., ut. 29 yrs., g.r. 8l., yr. 60l. 385

By FERNANDO & CO.

Kennington.—213, Kennington-rd., ut. 29l. yrs., g.r. 8l., yr. 37l. 250

By HAMPTON & SONS.

Hurbiton.—2, Parklands, f., yr. 75l. 820

By NOKES & NOKES.

Fammersmith.—1, Mastro-rd. (s.), ut. 59 yrs., g.r. 8l., yr. 50l. 600

By WHITE, BERRY, & TAYLOR.

Lepton.—Francis-rd., f.g.r. 14l. 5s. reversion in 60 yrs. 345

Salthay-rd., f.g.r. 18l. reversion in 89 yrs. 430

Valthamstow.—Arkley-rd., f.g.r. 24l., reversion in 81 yrs. 525

Greenwich.—Norman-st., f.g. rents 24l. 10s., reversion in 38 yrs. 175

Clarendon-pl., f.g.r. 7l., reversion in 39 yrs. 175

By WOOD & LOACH.

Edmonton.—8, The Parade (s.), f., cr. 35l. 52 to 68 (even), Barbot-st., and 16, 17, and 18, Rosebery-rd., ut. 71 yrs., g.r. 50l. w.r. 218l. 8s. 1,320

By WYER ADAMS & GLOVER.

Lamberwell.—Millbrook-road, f.g. rents 72l., ut. 18l. yrs., g.r. 4l. 5s. 705

Leckham.—Gibson-rd., f.g. rents "Alexandra Arms," f.g.r. 100l., ut. 59 yrs., g.r. 47l. 10s. 810

Toxtou.—1, Shepperton-rd. (s.), ut. 28 yrs., g.r. 8l., yr. 56l. 460

Bethnal-green.—Palmer-st., f.g. rents "The Princess," p.h., f.g.r. 100l., ut. 27 yrs., g.r. 23l. 13s. 850

Deptford.—Deptford Lower-rd., f.g.r. 60l., ut. 44 yrs., g.r. 8l. 5s. 700

Amal Park Town.—Park-st., f.g. rents "Dublin Castle," p.h., f.g.r. 120l., ut. 12l. yrs., g.r. 20l. 810

Lamberwell.—Commercial-rd., "Crown and Scapery," p.h., f.g.r. 75l., ut. 22 yrs., g.r. 4l. 5s. 900

Fammersmith.—York-rd., "The Princess Alexandra," p.h., f.g.r. 70l., ut. 54 yrs., g.r. 12l. 12s. 800

Leckham.—Sandison, etc., f.g.r. 80l., ut. 43 yrs., g.r. 18l. 1,005

t. Pancras.—Penbrooke-st., f.g.r. 31l. 10s., ut. 47l. yrs., g.r. 3l. 460

rompton.—Pelham-st., the "Pelham Arms," p.h., f.g.r. 120l., ut. 8l. yrs., g.r. 20l. 10s. 550

orwood.—Portland-rd., f.g.r. 80l., ut. 45 yrs., g.r. 12l., with reversion 1,270

Wandsworth.—Weyhill-rd., f.g. rents "The Arms," p.h., f.g.r. 84l., ut. 28 yrs., g.r. 20l. 780

Warylebone.—North-st., f.g.r. 45l., ut. 17l. yrs., g.r. 11l. 485

ackney.—Ray-st., etc., f.g.r. 80l., ut. 12l. yrs., g.r. 15l. 300

By BISLEY & SONS.

Leckham.—19, York-gr., ut. 73 yrs., g.r. 5l. 5s., yr. 40l. 390

Lechbury-st., f.g. rents 80l., ut. 57 yrs., g.r. 60l. 540

Garnies-st., f.g.r. 25l., ut. 59 yrs., g.r. 10l. 230

ulwich.—71 and 73, Glenbury-rd., ut. 75 yrs., g.r. 12l. 12s., yr. 60l. 575

erne Hill.—2 to 26 (even), Hurst-st., ut. 42 yrs., g.r. 67l. 5s., w.r. 591l. 10s. 3,200

ermoudsey.—284 and 286, Bolls-rd., ut. 38 yrs., g.r. 12l., w.r. 78l. 90l. 450

otherthwaite.—Bead-st., f.g.r. 19l., ut. 47l. yrs., g.r. 10l. 120

MEETINGS.

MONDAY, AUGUST 8.

British Archaeological Association.—Annual Congress opens at Bath.

Institute of Sanitary Engineers, Ltd.—Organizing Committee at 3 o'clock. Examination and Literary Committee at 5 o'clock. Council Meeting at 7 o'clock.

TO CORRESPONDENTS.

S. F. H. (Amount should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing when received by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exhibitory business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Hard Stocks. £ s. d. 1 16 0 per 1000 alongside, in river.

Rough Stocks and

Grizzlies 1 13 0 " " "

Facing Stocks 2 12 0 " " "

Shippers 2 10 0 " " "

Flettons 1 10 0 " " " at railway depot.

Red Wire Cuts 1 13 0 " " "

Best Firebrn Red 3 12 0 " " "

Best Red Pressed

Embon Facing 5 0 0 " " "

Best Blue Pressed

Staffordshire 4 4 0 " " "

Do. Bulhouse 4 10 0 " " "

Best Stourbridge 4 8 0 " " "

Fire Bricks 4 8 0 " " "

GLAZED BRICKS.

Best White and Ivory Glazed

Stretchers 13 0 0 " " "

Headers 12 0 0 " " "

Quoins, Bullnose, and Flats 17 0 0 " " "

Double Stretchers 19 0 0 " " "

Double Headers 16 0 0 " " "

One Side and two Ends 19 0 0 " " "

Two Sides and one End 20 0 0 " " "

Splays, Chamfered, Squints 20 0 0 " " "

Best Dipped Salt Glazed Stretchers and Header 12 0 0 " " "

Quoins, Bullnose, and Flats 14 0 0 " " "

Double Stretchers 15 0 0 " " "

Double Headers 14 0 0 " " "

One Side and two Ends 15 0 0 " " "

Two Sides and one End 15 0 0 " " "

Splays, Chamfered, Squints 14 0 0 " " "

Second Quality White and Dipped Salt Glazed 2 0 0 " " less than best.

Thames and Pit Sand 7 3 per yard, delivered.

Thames Ballast 6 0 " " "

Best Portland Cement 30 0 per ton, " "

Best Ground Blue Lias Lime 21 0 " " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 6d. per yard, delivered.

Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. apt.

STONE.

BATH STONE—delivered on road wagg. s. d. 1 6l. per ft. cube.

Do. do. delivered on road waggons. 1 8l. " "

Nine Elms Depot " " " "

FORELAND STONE (20 ft. average) 6 0 " "

Portland Whitbed, delivered on road waggons, Paddington depot, Nine Elms depot, or Fulmocho Wharf... 2 1 " "

White Basebed, delivered on road waggons, Paddington depot, Nine Elms depot, or Fulmocho Wharf... 2 2l. " "

STONE (continued).

ancaster in blocks..... s. d. 1 11 per ft. cube, del. rly. depot.

Beer " " " " " " " " 1 6 " " " " " " " "

Greenshill " " " " " " " " 1 10 " " " " " " " "

Darley Dale in blocks... 2 4 " " " " " " " "

Red Corshill " " " " " " " " 2 5 " " " " " " " "

Closeburned Freestone 2 0 " " " " " " " "

Red Mansfield " " " " " " " " 2 4 " " " " " " " "

YORK STONE—Robin Hood Quality.

Scrapped random blocks 2 10 " " " " " " " "

6 in. sawn two sides landings to sizes (under 40 ft. super.) 2 3 per ft. super. " " "

6 in. rubbed two sides ditto, ditto..... 2 6 " " " " " " " "

3 in. sawn two sides slabs (random sizes) 0 11l. " " " " " " " "

2 in. to 2 1/2 in. sawn one side slabs (random sizes)..... 0 7l. " " " " " " " "

1 1/2 in. to 2 in. ditto, ditto 0 6 " " " " " " " "

HARD YORK—

Scrapped random blocks 3 0 per ft. cube, " " " " " " " "

6 in. sawn two sides landings to sizes (under 40 ft. super.) 2 8 per ft. super. " " " " " " " "

6 in. rubbed two sides ditto, ditto..... 3 0 " " " " " " " "

3 in. sawn two sides (slabs random sizes) 1 2 " " " " " " " "

2 in. self-faced random flags..... 0 5 " " " " " " " "

Hopton Wood (Hard Bed) in blocks 2 3 per ft. cube, del. rly. depot. " " " " " " " "

" " " " " " " " 6 in. sawn both sides landings 2 7 per ft. super. del. rly. depot. " " " " " " " "

" " " " " " " " 3 in. do. 1 2l. " " " " " " " "

SLATES.

in. in. £ s. d.

20 x 10 best blue Bangor 13 2 6 per 1000 of 1500 at r. d.

20 x 12 " " " " " " " " 13 17 6 " " " "

20 x 10 first quality " " " " " " " " 13 0 0 " " " "

20 x 12 " " " " " " " " 13 0 0 " " " "

16 x 8 " " " " " " " " 13 15 0 " " " "

16 x 8 " " " " " " " " 7 5 0 " " " "

20 x 10 best blue Portmadoc " " " " " " " " 12 12 6 " " " "

16 x 8 " " " " " " " " 6 12 6 " " " "

20 x 10 best Fureka unfading green. 15 17 6 " " " "

20 x 12 " " " " " " " " 18 7 6 " " " "

18 x 10 " " " " " " " " 13 5 0 " " " "

16 x 8 " " " " " " " " 10 5 0 " " " "

20 x 10 permanent green 11 12 6 " " " "

18 x 10 " " " " " " " " 9 12 6 " " " "

16 x 8 " " " " " " " " 6 12 6 " " " "

TILES.

Best plain red roofing tiles s. d. 42 0 per 1000 at rly. depot.

Hip and Valley tiles ... 3 7 per doz. " " "

Best Broosly tiles..... 50 0 per 1000 " " "

Do. Ornamental tiles ... 52 6 " " "

Hip and Valley tiles ... 4 0 per doz. " " "

Best Ribton red, brown, or brindled do. (Edwards) 57 6 per 1000 " " "

Do. Ornamental do. 60 0 " " "

Hip tiles 4 0 per doz. " " "

Valley tiles 3 0 " " "

Best Red or Mottled Staffordshire do. (Peakes) 51 9 per 1000 " " "

Do. Ornamental do. 54 6 " " "

Hip tiles 4 1 per doz. " " "

Valley tiles 3 8 " " "

Best "Rosemary" brand plain tiles..... 48 0 per 1000 " " "

Best Ornamental tiles 50 0 " " "

Hip tiles 4 0 per doz. " " "

Valley tiles 3 8 " " "

Best "Hartshill" brand plain tiles, sand faced. 50 0 per 1000 " " "

Do. pressed..... 47 6 " " "

Do. Ornamental do. 50 0 " " "

Hip tiles 4 0 per doz. " " "

Valley tiles 3 6 " " "

WOOD. At per standard.

Deals: best 13 in. by 11 in. and 4 in. £ s. d. £ s. d.

by 9 in. and 11 in. 15 10 0 16 10 0

Deals: best 3 by 4..... 14 10 0 15 10 0

Battens: best 2 1/2 in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in. 11 10 0 12 10 0

Battens: best 2 1/2 by 6 and 3 by 6... 0 10 0 less than best 7 in. and 5 in.

Deals: seconds 1 0 0 less than best

Battens: seconds 0 10 0 " " "

2 in. by 4 in. and 2 in. by 6 in. 9 0 0 " 9 10 0

2 in. by 4 1/2 in. and 2 in. by 5 1/2 in. 8 10 0 9 10 0

Foreign Saw Boards:

1 in. and 1 1/2 in. by 7 in. 0 10 0 more than battens.

3 in. 1 0 0 " " "

At per load of 50 ft.

Fir timber: best middling Danzig or Memel (average specification) 4 10 0 5 0 0

Seconds 4 5 0 4 10 0

Small timber (6 in. to 10 in.) 3 12 6 3 15 0

Small timber (6 in. to 8 in.) 3 0 0 3 10 0

Swedish balks 2 15 0 3 0 0

Fitch-pine timber (30 ft. average) 3 5 0 3 10 0

JOINERS' WOOD. At per standard.

White Sea: first yellow deals, 3 in. by 11 in. 23 0 0 24 0 0

3 in. by 9 in. 21 0 0 22 10 0

Battens, 2 1/2 in. and 3 in. by 7 in. 17 0 0 18 10 0

Second yellow deals, 3 in. by 11 in. 18 10 0 20 0 0

11 in. 17 10 0 18 10 0

Battens, 2 1/2 in. by 7 in. 17 10 0 18 10 0

Battens, 2 1/2 in. and 3 in. by 7 in. 13 10 0 14 10 0

Third yellow deals, 3 in. by 11 in. and 9 in. 15 10 0 16 10 0

Battens, 2 1/2 in. and 3 in. by 7 in. 11 10 0 12 10 0

Contracts used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; f.g. for freehold ground-rent; r. for rent; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; yr. for yearly rental; t. for unexpired term; p.a. for per annum; yrs. for years; l. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; g. for avenue; gds. for gardens; yd. for yard; g. for gate; b.h. for beer-house; p.h. for public-house; o. for oaks; s. for shops; ct. for court.

WOOD (continued).		At per standard.	
		£ s. d.	£ s. d.
JOINERS' WOOD (cont'd.)			
Petersburg first yellow deals,			
3 in. by 11 in.	21 0 0	22 10 0	
Do. 3 in. by 9 in.	18 0 0	19 10 0	
Battens	13 10 0	15 0 0	
Second yellow deals, 3 in. by			
11 in.	16 0 0	17 0 0	
Do. 3 in. by 9 in.	14 10 0	16 0 0	
Battens	11 0 0	12 10 0	
Third yellow deals, 3 in. by			
11 in.	13 10 0	14 0 0	
Do. 3 in. by 9 in.	13 0 0	14 0 0	
Battens	10 0 0	11 0 0	
White Sea and Petersburg:			
First white deals, 3 in. by 11 in.	14 10 0	15 10 0	
Do. 3 in. by 9 in.	13 10 0	14 10 0	
Battens	11 0 0	12 0 0	
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0	
Do. 3 in. by 9 in.	12 10 0	13 10 0	
Battens	9 10 0	10 10 0	
Pitch-pine: Deals:			
Under 2 in. thick extra	16 10 0	20 0 0	
Oilments	0 10 0	1 0 0	
Yellow Pine—First, regular sizes	40 0 0	upwards.	
Second, regular sizes	30 0 0		
Yellow Pine oddments	25 0 0		
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0	
Danzig and Stettin Oak Logs:			
Large, per ft. cube	0 2 6	0 3 6	
Small	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as			
inch	0 0 8	0 0 9	
Do. do.	0 0 7		
Dry Mahogany—Honduras, Ta-			
basco, per ft. super, as inch	0 0 9	0 1 0	
Selected, Figury, per ft. sup. as			
inch	0 1 6	0 2 6	
Dry Walnut, American, per ft. sup.			
as inch	0 10 0	0 1 0	
Teak, per load	17 0 0	21 0 0	
American Whitewood Planks,			
per ft. cube	0 4 0		
Prepared Flooring:			
1 in. by 7 in. yellow, planed and			
shot	0 13 6	0 17 6	
1 in. by 7 in. yellow, planed and			
matched	0 14 0	0 18 0	
1 1/2 in. by 7 in. yellow, planed and			
matched	0 16 0	0 1 0	
1 in. by 7 in. white, planed and			
shot	0 12 0	0 14 6	
1 in. by 7 in. white, planed and			
matched	0 12 6	0 15 0	
1 1/2 in. by 7 in. white, planed and			
matched	0 15 0	0 18 6	
3 in. by 7 in. yellow, planed and			
leaded or V-jointed brds.	0 11 0	0 13 6	
1 in. by 7 in. do.	0 14 0	0 18 0	
3 in. by 7 in. white do.	0 13 0	0 11 6	
1 in. by 7 in. white do.	0 11 6	0 13 6	
6 in. at ed. to 9 in. per square less than 7 in.			

JOISTS, GIRDERS, &c.

	In London, or delivered	Railway Vans, per ton.
	£ s. d.	£ s. d.
Rolled Steel Joists, ordinary	6 5 0	7 5 0
sections		
Compound Girders, ordinary	8 2 6	9 5 0
sections		
Angles, Tees and Channels, ordi-		
nary sections	7 17 6	8 17 0
Fitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions		
including ordinary patterns	7 2 6	8 5 0

METALS.

	Per ton, in London.
	£ s. d.
IRON—	
Common Bars	7 5 0
Staffordshire Crown Bars, good	
merchant quality	7 15 0
Staffordshire "Marked Bars"	10 0 0
Mild Steel Bars	8 15 0
Hoop Iron, basis price	9 5 0
Galvanized	17 10 0
(*And upwards, according to size and gauge.)	
Sheet Iron, Black—	
Ordinary sizes to 20 g.	9 15 0
24 g.	10 15 0
26 g.	12 5 0
Sheet Iron, Galvanized, flat, ordinary quality—	
Ordinary sizes—6 ft. by 2 ft.	12 15 0
Ordinary sizes to 22 g. and 24 g.	13 5 0
26 g.	14 5 0
Sheet Iron, Galvanized, flat, best quality—	
Ordinary sizes to 20 g.	16 0 0
22 g. and 24 g.	16 10 0
26 g.	18 0 0
Galvanized Corrugated Sheets—	
Ordinary sizes ft. to 8 ft. 20 g.	12 10 0
22 g. and 24 g.	13 0 0
26 g.	13 15 0
Best Soft Steel Sheets, 6 ft. by 2 ft.	11 15 0
to 6 ft. by 20 g. and thicker	12 15 0
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0
26 g.	14 0 0
Cat nails, 3 in. to 6 in.	9 10 0
(Under 3 in. usual trade extras.)	

LEAD, &c.

	Per ton, in London.
	£ s. d.
LEAD—Sheet, English, 3 lb. and up	14 7 6
Pipe in coils	14 17 6
Soil pipe	17 7 6
Compo pipe	17 7 6
ZINC—Sheet—	
Vielles Montagne	27 0 0
Sheshan	26 15 0
COPPER—	
Strong Sheet	0 0 10
Thin	0 0 11
Copper nails	0 0 10
BRASS—	
Strong Sheet	0 0 9 1/2
Thin	0 0 10
TIN—English	0 1 3 1/2
SOLDER—Plumbers'	0 0 6 1/2
Timmen's	0 0 8
Blowpipe	0 0 9

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	23d. per ft. delivered.
" fourths	18d. "
2 1/2 oz. thirds	31d. "
" fourths	24d. "
26 oz. thirds	41d. "
" fourths	34d. "
32 oz. thirds	51d. "
" fourths	44d. "
Plated Sheet, 15 oz.	34d. "
" 21 oz.	19d. "
1/2 " Harry's Rolled Plate	19d. "
3/4 " " "	19d. "
1 " " "	24d. "

OILS, &c.

	Per gallon.	£ s. d.
Raw Lined Oil in pipes	per gallon	0 1 7
" " in barrels		0 1 8
" " in drums		0 1 9
Bolled " in pipes		0 1 9
" " in barrels		0 1 10
" " in drums		0 2 0
Turpentine, in barrels		0 3 6
" in drums		0 3 8
Genuine Ground English White Lead	per ton	18 5 0
Red Lead, Dry		18 10 0
Best Lined Oil Putty	per cwt.	0 6 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon.	£ s. d.
Pine Pale Oak Varnish		0 8 0
Pale Copal Oak		0 10 0
Superfine Pale Elastic Oak		0 12 0
Pine Extra Hard Churn Oak		0 12 6
Superfine Hardrying Oak, for		0 1 9
Churches		0 14 0
Pine Elastic Carriage		0 12 6
Superfine Pale Elastic Carriage		0 16 0
Pine Pale Maple		0 16 0
Finest Pale Durable Copal		0 18 0
Extra Pale French Oil		1 1 0
Eggshell Flattening Varnish		1 18 0
White Copal Enamel		1 1 4 0
Extra Pale Gold Size		0 10 6
Best Black Japan		0 16 0
Oak and Mahogany Stain		0 9 0
Brunswick Black		0 8 6
Berlin Black		0 16 0
Knottin		0 10 0
French and Brush Polish		0 10 0

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted, unless the amount of the Tender is stated, nor any list in which the lowest and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted

CWMSYFLOG.—For erecting a new infants' school, etc., at Cwmsyfog, near New Tredegar, for the Bedwellty School Board. Messrs. James & Morgan, architects, Charles-street-chambers, Cardiff.

J. Lewis .. 27,534 16 0 W. Williams & H. Rowlands .. 6,959 18 3 Sons .. 56,360 0
 J. E. Evans .. 6,650 0 0 Lattey & Co. .. 6,283 0 0
 D. Davies .. 6,470 0 0 Ltd., Cardiff .. 6,254 0 0
 D. H. Davies .. 6,447 0 0 E. Gronow .. 6,254 0 0

DOWNPATRICK.—For extension of county court-house, for the Down County Council. Mr. James Heron, County Surveyor.

J. & I. Stockdale .. £2,400 J. A. Gordon, New-P. McAlenan .. 2,320 towards* .. £1,995
 P. Ritchie .. 2,220

DUNDALK.—For additions and alterations to Newtowndar House and out-offices, for Mr. Robinson. Mr. W. S. Barber, C.E., architect, Francis-street, Dundalk. Quantities by the architect:—
 J. P. Gaskin .. £1,300 0 N. Cullingham,
 T. McDonald .. 1,288 0 Stabauon* .. £1,253 6
 J. Kelly .. 1,277 0

GUILDFORD.—For carrying out certain works at the Charlottetown School, for the Education Committee. Mr. E. Lunn, architect and surveyor, 30, High-street, Guildford:—

Alterations.	
Addis & Co.	£449
Higlett & Hammond	493
A. & F. Gammon	395
S. Ellis	383
Cunningham, Forbes, & Co.	260 0
Holman & Co., South Bermondsey*	£48 10

Whitening and Colouring.	
Higlett & Hammond	£171 0 0
A. & F. Gammon	164 0 0
S. Ellis	157 0 0
A. Franks	118 0 0
Tribe & Robinson	118 0 0
Tribe & Robinson	£449
R. Smith, Bury*	403
Fields, Guildford*	345
Holman & Co., South Bermondsey*	£48 10
Addis & Co.	£116 14 0
R. Smith	111 0 0
J. Foster	98 11 0
G. W. Edwards	94 17 6
H. W. Bilzard	157 0 0
17, Chertsey-street, Guildford*	73 15 0

HANWELL.—For the erection of a new school at Oaklands-road, Hanwell, for the Middlesex County Council:—
 F. G. Minter, Westminster* .. £18,250

HANWELL.—For alterations to St. Mark's School, Hanwell, for the Middlesex County Council:—
 A. & B. Hanson, Southall* .. £3,574

HAYLE (Cornwall).—For erecting a bungalow on Hayle Towns, for Mr. G. Spray, Cardiff. Mr. Humphrey T. Broad, architect, Hayle, Cornwall:—
 W. J. Rouch, £933 11 7 Mitchell & J. Berman & J. Duun, Cambridge and Hayle* .. £839 0 0
 Hoskin, .. 872 4 0
 Thomas .. 870 0 0

HUDDESFIELD.—For erecting jam works in the best market. Mr. Ben Stocks, architect, St. Peter's-street, Huddersfield:—
 Mason, A. Schofield .. £559 19 2
 Johnson, Hollingworth & Sons* .. 152 14 10
 Plumber: S. Hales .. 137 10 0
 Plaster: W. E. Jovitt* .. 29 10 0
 Slater: W. E. Jovitt* .. 9 6 6
 Pinders: W. H. Selvey & Sons* .. 15 13 0
 Ironfounders: H. Brook & Co. .. 45 15 6
 Concrete: J. Cooke* .. 67 19 7
 [All of Huddersfield.]

KINGSWINFORD.—For erecting an engine-house, boiler-house, and pump-room at Ashwood Pumping Station, Kingswinford, near Dudley, for South Staffordshire Waterworks Co. Mr. H. Ashton Hill, engineer, Paradise-street, Birmingham:—
 W. Willett & Sons .. £8,309 0 0 D. Roberts & Sons .. £6,290 0 0
 G. E. Jackson, 7,940 5 3 Gowing & In- .. 6,946 0 0
 J. M. Jackson .. 6,946 0 0
 H. Lovatt .. 6,799 5 0 J. Roberts & Sons .. 6,224 0 0
 H. Gough & Sons .. 6,750 0 0 Oakley & Coul- .. 6,219 0 0
 W. Sapperton .. 6,598 0 0 H. Dorse .. 6,195 0 0
 M. Rount .. 6,500 0 0 C. A. Horton .. 6,095 0 0
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 Collins & Giv- .. 6,487 0 0 J. Dallow & Sons, Black- .. 5,950 0 0
 J. Bowen .. 6,379 0 0 health, Bir- .. 5,950 0 0
 H. Wilcock .. 6,336 0 0 mingham* .. 5,950 0 0
 Co. .. 6,336 0 0

LONDON.—For alterations, repairs, and decorations at the Church of St. Mary Magdalene, Peckham. Mr. George A. Lansdown, architect, Regent-street, S.W.:—
 Barrie Broyer .. £1,925 0 0 U. & E. Lea .. £1,815 10 0
 W. Sayer & J. Marsland .. 1,545 0 0 Sons .. 1,257 0 0
 Sons .. 1,328 11 1 T. G. Sharp- .. 1,206 0 0
 wood .. 1,328 11 1 ington*

LONDON.—For alterations and repairs at 605 Portsdown-road, W., for the Executors of the late John Robbins. Mr. George A. Lansdown, architect, Regent-street, S.W.:—
 W. Road .. £495 Splers & Sons* .. £394
 Shire & Sons .. 405

LONDON.—For Fulham Town Hall extension contract. Mr. Francis Wood, A.M.I.C.E., Borough Surveyor, architect:—
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 W. Grear & Son .. 26,984 0 0 J. Chessum & W. Willett .. 26,700 9 6 *Sons .. 23,966 0 0
 Peddick Bros. .. 29,474 0 0 W. H. Landon .. 23,953 0 0
 Holliday & Son .. 23,769 0 0
 Greenwood .. 25,777 0 0 T. & E. Davey .. 23,769 0 0
 W. J. Ren .. 25,701 0 0 Martin, Wells, .. 23,760 0 0
 Frocker & Co. .. 25,080 0 0 Foster & Dick- .. 23,023 0 0
 J. E. Julouson & Son .. 21,995 0 0 B. E. Nighting- .. 23,205 0 0
 St. Imeson & Co. .. 21,960 0 0 Desiring & Son .. 23,197 0 0
 Cropley Bros. .. 21,882 0 0 Johnson & Spence .. 22,830 0 0
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 W. Lawrence & Son .. 21,538 0 0 Ltd. .. 22,870 0 0
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 H. Lovatt .. 21,434 0 0 P. G. Minter .. 22,172 0 0
 Co. .. 21,434 0 0 J. Ferguson & Co. .. 21,650 0 0
 Ltd. .. 21,400 0 0
 † Withdrawn.

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 Keith, Blackman, & Co.* .. £103 5

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LONDON.—For constructing an underground conveyance in Fleet-street, by Fetter-lane, for the Corporation:—
 W. Sharnur & Sons, Ltd. £2,097 0 0
 Davis & Bennett 2,077 0 0
 B. E. Nightingale 2,049 0 0
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 T. Wood & Sons, 110 10 | Luton* £105 0
Dunstable-road Schools (Tar Paving).
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 A. W. C. Hobman 296 0 0 | minster* £273 10 0
 & Co. 296 0 0

Surrey-street Schools (Tar Paving).
 B. S. Jones £227 10 0 | J. Smart, West-
 A. W. C. Hobman 211 0 0 | minster* £195 0 0
 & Co. 211 0 0

MALLING.—For erecting a porter's lodge at the Isolation Hospital, East Malling, for the Rural District Council. Mr. Chas. Souter, architect. Quantities by contractors:—
 W. T. Burrows, £254 0 0 | E. H. Pye £198 17 10
 G. Hodges & Son, £47 0 0 | Clark & Epps. 190 0 0
 W. H. Allchin .. 214 0 0 | R. Langridge,
 J. A. Davison .. 210 0 0 | Snodland* .. 189 0 0

NAINR.—For erecting a road bridge of two spans across the river Naira at Howford, for the County Council. Mr. P. M'Farlane Cram, C.E., Albert-street, Nairn. Quantities by engineer:—
Steel Work and Asphalt Work.
 Brandon Bridge Building Co., Ltd.,
 Motherwell £1,137 0 9
Mason Work.
 J. Mackenzie, Nairn 1,203 16 6

NOTTINGHAM.—For alterations and additions to premises of the Midland Institute for Blind, Chaucer-street and Clarendon-street. Mr. H. Gill, architect, Golden-chambers, Pelham-street, Nottingham:—

Hutchinson & Son	Section I.	Section II.	Total.
Donnett & Ingle	7,980 0	2,730	10,710 0
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A. B. Clarke	7,783 0	2,468	10,251 0
F. Mason	7,921 0	2,379	10,000 0
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W. Mauls & Co.	7,372 0	2,300	9,872 0

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 Ward & Co. £1,450 | G. Euston £1,289
 Ward & Co. 1,375 | Cox & Harris, Strat-
 E. T. Kennard 1,330 | ford-upon-Avon* 1,220

THAME (Oxon).—For water supply works, for the Urban District Council. Messrs. J. Taylor, Sons, & Santo Crimp, engineers, 27, Great George-street, Westminster, S.W.:—
 A. G. Osenton £7,965 15 0 | G. W. Dar-
 B. Cooke & Co. 7,593 7 0 | ington £6,208 0 0
 W. W. Howland 6,825 0 6 | C. Chamber-
 D. T. Jackson 6,851 11 10 | lains 6,079 2 7
 F. W. Trimam 6,755 0 0 | W. & V. Green
 A. E. Nunn .. 6,750 0 0 | & Co. 5,987 18 0
 J. Jackson .. 6,502 11 9 | Davies, Ball,
 J. Riley 6,363 16 0 | & Co.,
 J. H. Vickers 6,257 0 0 | Yeovill* 6,009 0 0

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 H. Charlesworth 162 12 6 | Tideswell* .. 118 18 11
 W. Barrick .. 151 2 9 | W. R. Swindell 112 0 0

TILEHOUSE.—For widening Tilehouse Bridge, near Kirbymoorside, Yorkshire. Mr. W. O. Bryning, County Surveyor, Northallerton:—
 W. Blackburn, Broughton, Malton £139 14 9

WEST HAM.—For making-up streets (part of Kingsland-road, Olive-road, Patrick-road, and Coronation-road), for the Borough Council. Mr. J. G. Morley, Borough Engineer, Town Hall, West Ham, E.:—
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 T. Adams .. 1,363 14 8 | son 1,119 8 10
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ILLUSTRATIONS.

Jumièges: Nave, from West End	From a Photograph.
Some Breton Chapels:—	
Saint-Fiacre; St. Barbe; Church and Calvary of Tronoan; Penmarek; Notre-Dame de la-Joie, etc ...	From Photographs.
House at Croydon	Mr. W. F. Harber, Architect.
Exmouth Cottage Hospital	Messrs. Tait and Harvey, Architects.

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Human Notes	M. B. Cotsworth's "Railway Maximum Rates,	Miscellaneous
Parliamentary and Archæological	Charges, and Traffic Acts"; W. A. Tooke's	Legal:—
Exmouth Cottage Hospital	"Oil Engines: their Selection, Erection, and	Point under the London Building Act, 1894
Military Fittings	Correction"; Major R. F. Sorbie's "Notes on	Cases under the Workmen's Compensation
Architectural Societies	Blacksmiths' Work"; William Spinks' "The	Act, 1897
Modern Cottage Architecture"; The	Law and Practice Relating to Private Street	Point under the Factory and Workshop
Rev. R. S. Mylne's "Bayeux Cathedral"; J. W.	Works, together with an Appendix, containing	Act, 1891
Small's "Ancient and Modern Furniture";	Particulars and Decisions of Cases"; W. J.	South Kensington Building Dispute
F. E. Sidney's "Anglican Innocents in Spain";	Blackburn's "Saw Mill Work and Practice: a	Damage to Property by Flooding
L. F. Day's "Stained Glass"; W. G. Smith's	Book for Owners, Overseers, and Operators of	The Brighton and Hove Sewage Dispute
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Hind's "Adventures among Pictures"; "The	Exmouth Cottage Hospital	Patents
Country Gentleman's Estate Book, 1904";	The Student's Column	Some Recent Sales
"Timber: Growth and Structure; Felling, Con-	Trade Catalogues	Meetings
verting, and Buying, etc."; "Subject List of	Obituary	Prices Current
	General Building News	Tenders

Painting—From the Artist's Point of View.

NOTHING strikes one more in listening to passing remarks in public picture-galleries, or to current conversation in society about pictures, than the inability of average exhibition-goers to formulate any judgment of pictures on principle, to realise what makes the quality of a picture good or bad, or even to perceive that there is any principle involved at all. They are persuaded that it is entirely "a matter of taste." Yet if one were to ask two or three competent painters or art-critics to go round a gallery and select, independently, what they each considered the good pictures of the collection, though their preference for one example over another might vary, their lists of the good pictures would be nearly or perhaps entirely the same. This is because they would know what should be the objects and what are the difficulties of the art of painting, and whether these objects are attained or not. The general public think nothing of such questions; they merely "like" this or "don't like" that, and in most cases their liking depends either on whether the subject of the picture interests them, or whether it appears to them to be a successful imitation of some object natural or artificial. The idea that the

object of the art of painting is not imitation is bewildering to them. If not for that, what is painting for?

And the question is too large and complex, certainly, to be answered in a sentence; nor are we attempting to answer it here. It would be matter for a separate treatise. But something may be learned of the objects of painting, and of what are not its objects—of the painter's aims and methods, and of the difficulties with which he has to contend—of the true intellectual interest of the art, from Mr. Clausen's six lectures on painting, now published, with some alterations, as a book.* The lectures were originally delivered especially to the art-students of the Royal Academy; but if the general public could be induced to read them (and there is nothing in them that requires expert knowledge to follow and understand), they would be in a way to understand more about painting than they mostly understand now, to enjoy it more and to judge it with more insight. We are not sure indeed, that a book like this is not really far more valuable to the general reader than to the art-student. It cannot teach the art-student to draw or colour, which is his business; it can only suggest to him the aim and direction of his studies. But it can or should teach the general reader—the spectator at exhibitions—to think, both as to the objects of painting,

and as to its relation to nature. As the author says at the close of his third Lecture:—

"We can only see what we have learned to look for. An uneducated person will consider a face in a picture beautiful if it has bright eyes, pink cheeks, and red lips; or a landscape beautiful if it also presents him with the obvious facts. It will be enough for him; it is as much as he sees in nature. But Nature does not reveal her beauties unsought, and the study of paintings by those who are not artists is not only an education, but an added pleasure to their lives, enlarging and directing their minds, so that they learn to detect and appreciate beauties in nature to which they would otherwise have been blind."

This, it may be observed, suggests something much beyond Browning's celebrated and certainly admirable expression (in "Filippo Lippi") to the effect that we care for things for the first time, when we see them painted, which we have seen fifty times before and never noticed. The reason is a double one: first, there is the natural interest in the display of skill in drawing and colouring; secondly, the comparison of the drawing with the original (or our recollection of it) leads us to notice points in its form and structure which we had not noticed before. This is, however, merely the realism of painting; and implies that even imitation, though not the true or highest object of art, has its interest and its educational value. But Mr. Clausen's suggestion goes further than this; it implies the perception of a beauty and a sentiment in nature sought out and translated by the painter, whose work in turn may suggest to the spectator something in the scene of deeper interest than a casual inspection of its mere physical facts would reveal. Thus in

* Six Lectures on Painting, delivered to the students of the Royal Academy of Arts in London, January, 1894. By George Clausen, A.R.A., R.W.S., Professor of Painting in the Royal Academy. London: Elliot Stock, 1904.

landscape-painting the artist is the translator, not the mere imitator of nature.

For all painting, as the author says elsewhere, is a partial statement—a reading or rendering of nature, rather than an inventory. This is in his second chapter, "On Lighting and Arrangement," where the amateur may obtain many hints as to the problem of the general composition of a picture, a far more complicated and difficult one than those who view the finished result are likely to surmise: the difficulties of picture-making really lying not in the treatment of separate details, but in what Mr. Clausen calls "The control of the whole canvas"—the determining what part of a picture is to be given prominence, and how that is to be attained; and composition in line and in light and shade is well illustrated by two sketches after Velasquez and Corot. Then we have the difficulties, which are quite out of the grasp of most exhibition-goers, arising from the necessity, because pigments have no positive light, but only absence of dark, of arranging the values of a picture so that the sun, for instance, if introduced, shall have sufficient light effect by contrast; or that the light in the sky shall be sacrificed to the ground or the figures, or *vice versa*, if necessary. A good example of the want of convention is mentioned in the case of Holbein's "Ambassadors," where the figures, as we have always felt, do not assert themselves sufficiently, in consequence of the realistic working up of all the accessories. Some remarks on "the disturbing influence of photography" should not be overlooked. The photograph sees what the human eye cannot; it therefore cannot present nature as seen by the eye. Photography can be suggestive (or, we may perhaps add, useful as a memorandum), but "you cannot make that yours which the camera chooses to give you. You must make your own selection from nature." And he remarks, as we have often done, that photographers are now seeking to use, though clumsily, the conventions of the painter, by arranging the tones and concentrating the lights of their pictures; which in fact is only doing badly what a painter can do much better.

The lecture on "Colour" is full of suggestions which will be new, or at least unthought of usually, to many who examine pictures. What a field for observation is suggested by the mere remark that "nothing in nature is actually the colour that we see it. It only appears to us at a given moment as a particular colour, in relation to the other colours that surround it"; and some facts illustrative of this are mentioned. The tendency to paint out of doors in too cold a key is given as the reason why we often see "pictures of sunlight which give no impression whatever of warmth," changing their key when brought into indoor light. This may be the reason for those pictures of the modern Dutch and modern French school which we sometimes see, with the title "Summer," or "Sunny day," and which are absolutely chill in their effect. The question of "quality" in colour is another curious problem. Two men will paint a sky with the same pigment; one will give an impression of sky, the other

only of blue paint. In what does the difference lie? It is impossible to define; it is a kind of intuition on the part of the painter. The painter in water-colour, however, has his quality to some extent made for him by the conditions of the transparent material. The author speaks finely of "the emotional power of colour—*i.e.*, the power which colours in themselves have in inducing a mood—as an important element in painting."

"The sad, golden tone of Rembrandt seems to strike the keynote of his sentiment, and to bring us into his frame of mind before we realise his subject. In the same way, the rich reds and warm colours of Titian, Rubens, and Reynolds produce in our minds the sense of activity, richness, and splendour, quite irrespective of the drawing or modelling of their figures, or of the meaning."

Nothing could be more true, yet it is surely pushing the thing too far to say that truth or beauty of colour is "the only thing that gives a picture a high place among the masterpieces." How does that square with the author's great admiration for Michaelangelo, as standing apart from all other painters, and who was certainly not a great colourist? The inspiration of a picture certainly appears more in colour than in any other quality; but it may have a high intellectual power independent of colour.

Our space is limited, or we would gladly have followed Mr. Clausen more in detail through his lecture on the fascinating subject of "Landscape and Open-air Painting," in which however we cannot but draw attention to an admirable remark as to the essential element in landscape art. A landscape must be a record of a scene, and true to the appearance; but there must be something more. And what is that "something more"? "The interest for us lies in seeing or recognising the great elemental forces of nature, living and acting through the little things upon the earth. A landscape should not be so much an inventory as a transcript or translation of a mood of nature." If people could only be got to understand this, there would be a very different popular appreciation of landscape painting and landscape-painters from what at present obtains in this country. Not but that "transcribing" may be carried too far; we are perhaps tempted to think that Mr. Clausen himself carries it too far occasionally. But in any case it is more intellectually interesting than realism.

We may conclude with a reference to a point touched upon in the Introductory chapter, on which we cannot quite agree with the author. He says that the distinction made in the present day between painting which is decorative and painting which is pictorial is unfortunate, and ought not to exist, as "all pictures should decorate the walls or places on which they are placed." It is of course true that all pictures should in one sense be decorative in line and composition; that is the artistic element in the design of a picture; but this need not be confounded with the use of the word "decorative" to imply a certain conventional and architectural character of design, which is not, and is not intended to be, realistic. We are, in fact, using the same word in two distinct meanings. A "decorative picture," in the latter meaning, is one which is kept on a front plane, and designed with a certain severity of line;

it is the style, in fact, suitable to fresco painting on a mural surface, as again that suitable to oil-painting on a frame canvas. The latter, no doubt, may also be decorative, but in a different sense. We want another word in our artistic vocabulary.

There are few points indeed, however which we should question or take exception to in this admirable book, which we hope will be widely read; it cannot be intelligently studied without profit to the reader.

SOME BRETON CHAPELS.

By F. C. EDEN.

ABOUT ten miles north of Quimper, on the departmental road running between that town and Carhaix, there is a spot where the traveller who keeps a sharp look-out towards the east may be able to detect a group of three slender spireless towers, just showing their points above the trees. A gate in the hedge opens into some squalid farm premises, across which a dirty track, almost impassable in wet weather, must be followed, and it loses itself in a green field, where the rises out of the grass just opposite the charming Gothic front of S. Fiacre Chapel. Here we have a typical building of its class, and a veritable treasure-house for painter, architect, or ecologist. Typical in many respects, to the fact of its being not a parish church but a simple chapel, where the only services held during the year are the annual "Pardon," or dedication feast, it owes an entire immunity from restoration.*

Even in remotest Brittany it is hard to find an unrestored church, so that it is to the chapels that the true lover of "old, unhappy, far-off things"—of this Gothic, in fact, must needs turn. Typical too, is S. Fiacre in the way it eludes discovery—even when you know the whereabouts of one of these buildings it is often extraordinarily hard to get upon, and usually impossible of access except on foot—and so, also, in evidences of former prosperity, and having been designed in a fine enthusiasm and with far greater originality and skill than the average parish church of the district, where too often dullness reigns. There is one almost invariable accompaniment of a chapel which, however S. Fiacre lacks, and that is the grove of closely-planted beech or chestnut trees which make thin shadows about the Calvary, and on the mossy turf, as it seem to suggest, as things in Britain so often do, some Druidic prototype.

To return to the façade. The chapel is a remarkably good example of a fairly common type (*cf.* Penmarch and Tronoët where it stands over the chancel area, and the ruined church at Kéruity). The west wall is of enormous thickness and carries three spire-crowned turrets. The central spire is crocketed, and springs between traceried gables from the square open stage in which the bells are hung. At the foot of this sta-

* An immunity it is not likely to enjoy much longer, for the building has been made a *monument historique*, so that if anyone would see it before it is re-roofed, re-plastered, re-ceiled, and re-glazed, let us set about doing so without delay.

which is sturdier than usual) is an over-arching gallery, prettily corbelled forwards, and bridged across right and left by lesser flanking turrets, one of which loses a newel stair, and the other a little octagonal room with square-headed windows. The side spires are of unequal height, and the southern, or stair turret, set somewhat behind the plane of the other two—a delicate subtlety of design, in no way dictated by structural necessity, but completely justified by results, in that the three spires, as seen in different points of view, group in a confusingly puzzling and picturesque perspective. The material is a close-grained variety of granite, capable of receiving exceptional delicacy of treatment, and the detail is all of the most refined character.

The south porch is of the "Apostle" type, so common throughout Brittany, with double entrance doors, and a copied stoup corbelled out from the *meau*. The interior exhibits many characteristic features. Here you may expect to find a floor, partly of heavy granite slabs, and partly of earth; a painted rood screen, with its loft and figures; mouldy altars defaced and discoloured; tattered shreds of rich glazing painted across traceries of extreme elegance; a large east window, with a central mullion in a square, English-looking *chevet*; whitewashed walls sensibly striped along the base with black; any homely images on brackets about the altars, those of Our Lady and the Virgin on the east wall enshrined in high shuttered tabernacles of timber; boarded barrel ceiling, distempered red, but with its wall-plates and dragon-headed beams uncoloured; and perhaps a wheel of bells or a decayed altar canopy lying somewhere in a corner.

Such, surely, must have been the appearance of many of our own village churches in Elizabeth's reign. Here we have the very items of the XVIIth century inventories, with that old-world savour clinging about them yet, which the quaint directness and antique spelling of the inventories themselves seem so curiously to reflect. How better could one describe the rood screen at S. Fiacre, for instance, than as a "parclose of old paynted tymbre evyding the quyer and the body of the church, whereon stoundyth a roode with dyvers olde ymages of tymbre"??*

The altar in the middle of the aisle, now covered with broken imagery, shows signs of having been "inclosyd with oke." What the early ecclesiologists called a "bench-table" runs along the north wall and round the transepts, and is the only "sitting accommodation" in the chapel. There are many fragments of glass. The most complete window is that over the altar in the south transept. The centre light displays a jesse-tree on a blue ground, and the sidelights the twelve apostles in couples under canopies. In the quire there is "jytell galery of tymbre" capable of holding about three persons, and approached by a stone turret stair. Whether it was a pulpit or a singer's gallery could not be determined. It is now rickety and unsafe.

The screen was badly tinkered some time in the sixties, when its stair was

probably made away with. There is no evidence to show whether it was straight as at S. Nicolas, or spiral, as at Lambader; and now there is no means of access to the loft.

The little market town of Le Faouët, situated on a hill about two miles to the north, will be found an agreeable stopping-place—at least it used to be so before it was "discovered" by artists. From here may be visited two other chapels of great interest—viz., S. Barbe and S. Nicolas.

A pleasant walk of about a mile along a paved pilgrim's way through field and forest brings us to the brink of a deep wooded combe, at the bottom of which sparkles the Ellé. Here the chapel of S. Barbe comes suddenly into view over the precipitous edge of the valley,

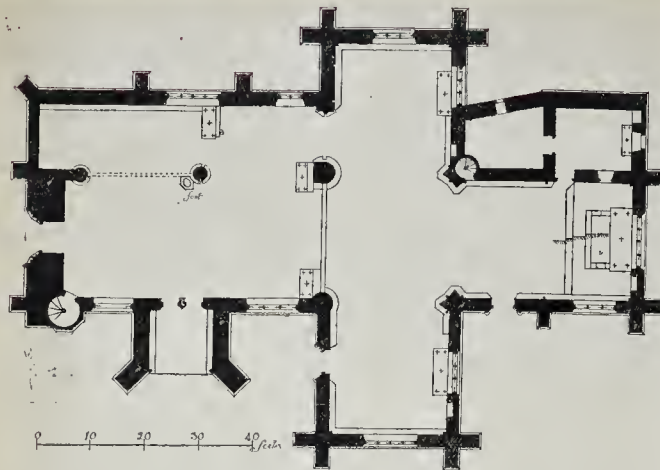
growing naturally enough from a kind of rocky ledge among trees and boulders. The first glimpse is disappointing, for the heavy hand of the XIXth century has been laid sore upon the little sanctuary, knocking the mediæval fun out of it, and leaving all sleek and prudish.

We are standing on a paved platform, from which a noble granite stair branches downwards to right and left; in front a bridge carries the gangway across to the tiny chapel of S. Bernard, perched on an isolated rock, but, save for its position, uninteresting. The stair to the left lands us just in front of the entrance to S. Barbe. The building, small as it is, is provided with two large double doorways, side by side, each pair under an enclosing arch, doubtless arranged for the stream of pilgrims to file past



S. Fiacre: West Front.

* From the inventory of Temple Balsale.



S. Fiacre: Ground Plan.

in an orderly way on the occasion of the "Pardon," which is said to be much frequented.

The plan is curious, and consists merely of a quasi-transsept, from which a shallow apse juts over the steep valley side. The exterior of this part of the building has an air of dignity and repose out of all proportion to its size. The north-west angle turret is probably designed to represent the traditional emblem of S. Barbara—viz., the tower in which she was imprisoned by her father, and one may see the image of the saint peering from an unglazed upper window. Here is some fair late glass, much mixed with had modern stuff, and a carved gallery, but the chapel has been considerably modernized, and, compared with the outside, the interior presents few features of interest.

The Chapel of S. Nicolas, in Prisiac, is most difficult to find. It is too far from le Faouët for a guide to be taken, and as the peasants speak no French, it is little use for one unacquainted with Breton to ask the way. It stands on high ground, about half a mile from the road, and is completely hidden by trees. The belfry is simple and good, but otherwise the outside is not particularly attractive. The great feature of the chapel, however, is its magnificent late screen. The whole is painted, and both sides of the loft bear figure sculpture; the west, scenes from the life of the patron, and the east, the twelve apostles; on this side there is a fixed desk in the form of a pelican. An unusual feature is the panelled and canopied backboard to the road, which stands in the usual Breton way, not in the loft, hut on the gallery front. The screen was repainted, as an inscription testifies, in the year 1768, but all the same the colouring is excellent, if somewhat rough in execution, and doubtless follows the old lines. The plan of the chapel is cruciform, without aisles, and, as at S. Fiacre, the screen stands west of the crossing.

The nave is very dark; in fact there is only one window, and that a small rose set high up in one of the side walls. It is not unusual for the smaller chapels to be thus scantily provided with

windows. One near Le Saint has only two, both being in the chancel, and in a cornfield near Belle-isle-en-Terre is a chapel, capable of holding some fifty worshippers, which has no windows at all. At the "Pardon" (as the writer had the opportunity of observing) the bulk of the assistance is "accommodated" outside.

S. Nicolas has some interest for Englishmen, in that an effigy of Dutch William, called Pistolance (Prince d'Orange), was for more than a century solemnly burnt at the annual "Pardon"; an edifying ceremony now fallen into desuetude. Probably the best-known and the most ambitious edifice of its class is the chapel of N. D. de Folgoët, near the remote town of Lesneven, in the north-west corner of Finistère. Its very richness in carving and mouldings has been its undoing. Its Gothic spirit is now quite broken, for the whole building has been so scarified within and without that the frigid inhuman interest of the typical *monument historique* is all that remains. There is a good stone *jubé*, remarkably effective on the east or wrong side, and a high altar, 14 ft. long, adorned along the front with a row of niched figures.*

Lambader is easily reached on a bicycle from the old cathedral town of S. Pol de Léon. It is a former chapel of the Templars, and in plan and scale much resembles a parish church. Two fine crosses are passed on the approach, and there is a broken shaft and a Gothic fountain in the churchyard. The fabric has been utterly modernized, but still retains sundry features of interest. There are three mediæval altars, each with its stone "halpas," or low reredos, provided with a broad top for the display of images or reliquaries, and not to be confounded with the modern "gradine." The halpas is itself a reredos, the top of which forms a shelf or ledge; not a shelf for candlesticks set in front of a reredos.

The screen is delicate and elaborate rather than beautiful, and is chiefly noticeable for the excellent contrivance

* Nodier gives a fine measured drawing of this altar.

of its spiral stair. So cunningly is the managed that, though standing between screen and altar, it interferes in no way with the view of the latter as seen between the muntins. Nor is it a flimsy affair by any means. The steps, eighteen in number, are solid, of about 6½ in. rise, and tenoned into a 4½-in. newel post. Each is pinned to the step above it, and, though no support is given to the outer string, which is purely decorative, the stair is as firm and noiseless as when first put together.

The chapel known as the Creisker, at S. Pol, has likewise been made a national monument, and with the usual result. It is of the general form and scale of the parish church, and has an ugly steeple which is much admired.

Belle-isle-en-terre, a small town on the main road, between Morlaix and Guirivamp, though, like le Faouët, it possesses no buildings of any interest, is a convenient stopping-place, and has a comfortable inn. About seven miles to the west, in the direction of Morlaix, and right upon the high road, lies the chapel of Keramanach ("house of the monks"). This little edifice exemplifies what has been said of the extreme care which was often bestowed upon the design of these buildings. The simple belfry is entirely satisfactory in proportion and detail, while the windows show what time and skill can do with such a stubborn material as granite. The tracery is both strong and refined; that of the great east window comprises over ninety openings, and, unlike so much flamboyant work, is divided into orders duly subordinated; indeed, considering the nature of the material, the grace and freedom of its lines are quite wonderful.

The plan is a simple parallelogram with a porch and north aisle, the latter apparently added as an afterthought. Behind the altar is a low wall inclosing a small sacristy, which is entered by a minute door on the gospel side. The middle part of the wall is stepped up to make space for a reredos composed of alabaster reliefs set in a black wood frame. The only remains of the screen are two moulded uprights, and a short piece of cross-beam set gallow-wise against the south wall as a support for the rood. A canopy, or tester, which was formerly suspended by a chain over the high altar, of Gothic form but debased detail, now lies neglected by the west door. The tracery of the east window is full of delicate XVth-century glass, consisting mostly of heraldic devices and angels in white and stain.

In a valley that intersects the curious boulder-strewn country about Huelgoat lies the beautiful chapel of S. Herbot. Seen from far is the great square tower which gives such nobility to the little sanctuary as the smaller Breton churches can seldom boast. In the churchyard is a Calvary group poised on a tall shaft. It is a good specimen of its kind, and more satisfactory than the wild processions of crude imagery which attract so many tourists to the ambitious structures at Guimilian and Plougastel. The screen is fully developed Renaissance, and has no loft. On either side of the rood, its painful contortions, are the gibbeted figures of the two thieves. Several other painted saints stare out of tabernacles

beside the altars, or stand on iron brackets against the columns. The building is in good repair, and looks as if it were used for parochial purposes, but, happily, it has not yet been "brought up to date."

Kerfons Chapel is in a very remote situation, far from the high road, and, perhaps, for this reason, retains more of its ancient fittings than any chapel which the writer has visited. It has, however, suffered terribly from neglect and ill-usage. Part of the nave has evidently been open to the weather for some considerable time—it is now rudely ceiled with deal boards, and the condition of much of the woodwork is sufficiently deplorable to be made the excuse for a good deal of doubtless drastic renovation whenever it is taken in hand.

The screen, with its loft and spiral wooden stair, is of exceeding richness. The painting lacks the delicacy and precision of English work, but is soft and pleasant in tone. Images of SS. Mary and John, much weathered and withered, still adorn the gallery front, but the rood itself lies in pieces in the loft. It is a simple cross *ragulé*, but when reconstructed was found to be of such admirable proportions, and to compare so well with the side figures, that the dimensions are worth noting. They are as follows:—

Height of cross, 7 ft. 8 in. (The top has been fitted to a socket, possibly for the pelican in her piety.) To underside of arms, 5 ft. 10 in. Width across arms, 5 ft. 7 in. Diameter of section, which is roughly circular, $3\frac{1}{2}$ to 4 in. Height of the Christ, 4 ft. 11 in.; of side figures, 3 ft. 4 in. Distance apart of same, centre to centre, 5 ft. 6 in. Height of loft front on which all stand, 3 ft. 9 in.

Beside the broken rood there was a "standing letterne of tre in the rood lofte," a triangular pedestal covered

with flamboyant carving and supporting a double turning desk, the feet in the shape of clenched hands. There is some good panelling in the transept with a fixed bench against it; several linen panelled doors with braced stiles; quite a "populus statuorum," forlorn things on brackets; an interesting and peculiar Renaissance ceiling in the south transept, and some good furniture in the sacristy falling to decay.

Of the other chapels visited by the writer, Kernascléden, a rich, vaulted building, is a *monument historique*, and has been vulgarised *à la mode*. It is now parochial. There are some paintings of angels in fine floating draperies on the north transept vault, and an elaborate porch. N. D. des Cieux, near Huelgoat, has a picturesque belfry, but the inside is spoilt.

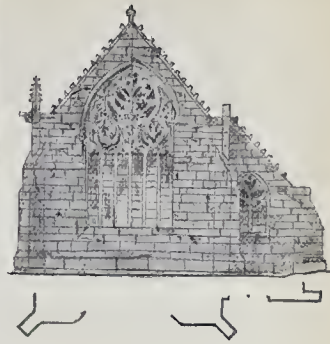
Locmaria, finely situated on the lofty river bank just above Belle-isle, has a beautiful screen, which has lost one, and that the more elaborate side of its loft, by its unfortunate conversion into a western gallery. Judging from the beauty of what remains it must have been quite as fine as the Kerfons example. The good painted rood figures were found stowed away in a little ossuary adjoining the porch.

The following particulars of the mediæval altars in S. Fiacre and elsewhere will be of interest to ecclesiologists. They are all of granite, and, with very few exceptions, perfectly plain. The *mensa* is a thickish slab, chamfered on the under side, and there is usually a simple hollow for a base-mold just above the floor level. It seems unlikely that the lesser altars had foot-paces, but if so they were doubtless of wood, and movable.

It may be noted that, as in England, the altars, when not set against screens or pillars in the body of the church, stand under windows, the glass-line of which is seldom more than 2 ft. or 3 ft. above the *mensa*; the window itself, in conjunction with the inevitable pair of images on brackets, doing duty for a reredos. The dimensions of the high altar at S. Fiacre are 11 ft. 7 in. by 4 ft. 1 in. by 3 ft. 3 in. high. The fore part of the *mensa* is carried on columns, the back part resting on a block of masonry. The sill-line of the east window is 2 ft. above the top of the altar, and the total width of the chancel is 21 ft. 8 in.; less than twice the length of the altar, be it noted, in view of the undignified stumpiness of most modern altars. I measured an unusually large altar in the parish church of Plouaret. The slab is 18 ft. long, by 3 ft. 10 in. in width, and is 10 in. thick; here the altar is even larger in proportion to the width of the chancel, which is only 26 ft. 6 in. between walls.

S. Sebastian's altar stands outside the screen, against the eastern pier of the nave arcade, and has a stone reredos 4 ft. 8 in. high, resting on the altar itself, not, as is the usual modern arrangement, on a separate erection. The dimensions are 5 ft. 7 in. by 3 ft. 3 in. by 3 ft. 7½ in. high. Altars in the body of the church against columns and so forth, are of course relatively short.

The screen altar is 5 ft. 2 in. by 3 ft. 9 in. by 3 ft. 6 in. high; and has a rough ledge



Keramonach : East End.

at the back raised an inch or two above the slab, which probably carried a halpas or low reredos.

The north end of the aisle altar is built right up to the wall, interrupting the bench table, and there is a bracket *piscina* projecting at the back. The slab is 6 ft. 4 in. by 2 ft. 6½ in. wide, including a space 7 in. wide on which a reredos formerly stood. The height is 3 ft. 1¼ in. above the present floor level.

At Lambader a Gothic altar in the nave measures 5 ft. 10 in. by 3 ft. 10½ in. by 3 ft. 4½ in. high, and carries a halpas about 2 ft. in height. The altar in the north chapel is 5 ft. 3¼ in. by 3 ft. ½ in. by 3 ft. 4 in. high. Its halpas is 2 ft. 2½ in. high, and 10¾ in. broad, and carries two plain shields in front, and a moulded cornice. From the top of the halpas it is 1 ft. 8 in. to the glass line of the window.

The north transept altar in S. Nicolas measures 6 ft. 2 in. by 2 ft. 6 in. by 2 ft. 11 in. high, and is 1 ft. 5 in. below the splay of the window-sill. The high altar at Keramonach is 11 ft. 1 in. by 2 ft. 10½ in. by 3 ft. 8 in. high, in a sanctuary 21 ft. wide, so that the proportion is about the same as at S. Fiacre. One point to be noted in connexion with old altars is their ample width from front to back; a dimension almost as essential to dignity as length, but the importance of which is rather apt to be overlooked nowadays.

The few chapels described above are those alone which the writer has had the opportunity of studying; but when it is stated that in the department of Morbihan there are no less than 118 (omitting those which are in ruins or quite modern), in the Côtes du Nord 98; and in Finistère 45, whose dates range from the XIIth to the XVIIIth centuries; and that some of them, as Rosgrand, S. Avoye, Bréhan, N. D. de la Clarté at Baud, S. Nicolas at Plédran have rood screens, or considerable remains of such; that several still preserve mural or roof paintings; that still more retain reredoses, imagery in wood and stone, and considerable quantities of stained glass, and that there are more or less interesting crosses, calvaries or fountains in the vicinity of the majority, it will be seen what a field for discovery is open to anyone who should be led to make a special study of these unique buildings.



Keramonach : West Front.

NOTES.

Electrification of the Metropolitan Railway. LONDONERS are still waiting with commendable patience for the completion of the improvements now in hand by the two underground railways—the Metropolitan and District Companies. The work of changing these lines from steam to electric traction is of onerous character. Bearing in mind the mileage and the heavy train services involved, it may fairly be said that the undertakings are of far greater magnitude than any works of the kind hitherto attempted in the whole world. The generating station of the Metropolitan Company has already been completed; the cables and conductor rails are laid, and the general equipment of the permanent way is complete from Baker Street to Uxbridge. Similar work is now in progress night after night on the Inner Circle section of the line, and we believe will shortly be completed. The new rolling stock is partly delivered and the remainder is in course of construction in Birmingham and Manchester. Considering the difficulties and delays that always arise in connexion with important engineering works, it is evident that satisfactory progress has been made by the company, and that at no distant date one of the most beneficial works of modern times will be consummated. We are glad to learn that some of the principal officials of the company are about to visit the United States to inquire carefully into the methods of working electric railways in that country, with the object of obtaining some hints that may be of service when electricity furnishes power for traction on the Metropolitan Railway system.

The Hotel Astor, New York. PROBABLY the Hotel Astor, which will shortly be opened in New York, is the finest building of its kind ever erected. Every possible detail has been included, whether for securing economy of management or the convenience of residents. One of the most interesting features is the mechanical plant, which is fully described in a recent number of the *Engineering Record*. This installation will be open to the inspection of visitors, in accordance with the custom usually followed in numerous modern American hotels. The plant includes watertube boilers with an aggregate capacity of 2,400 horse-power, a refuse destructor with a 50 horse-power boiler for the utilisation of waste heat from the furnace, electricity generating sets of 1,600 horse-power, from which current will be supplied for lighting, for lifts, as well as for pump and other motors. The lighting system includes 13,000 lamps of 16 candle-power; the lift equipment seven passenger and two luggage lifts, besides conveyors and hoists, and represents 336 horse-power in motors. The heating and ventilating plant comprises over 43,000 square feet of radiating surface, and sixteen fans, capable of circulating 240,000 cubic feet of air per minute. Hot and cold water supplies, pneumatic delivery tubing, compressed air and refrigerating plant are also important features of the equipment. We must refer our readers to the detailed description for full particulars of this remarkable installation, which, in addi-

tion to its utilitarian purpose, is of distinct educational value.

Extraordinary Traffic on Highways. THE recent case of the Kent County Council v. The Corporation of Folkestone, in which Mr. Justice Darling found as a fact that there had been an extraordinary use of a highway by the Corporation of Folkestone so that they were liable to the cost of repair of the part so used, exemplifies a growing legal tendency of great importance to contractors and hauliers. This tendency is the increasing activity of highway authorities to take proceedings in respect of extraordinary traffic. It is natural that they should do so, being stronger and more business-like bodies than the old parish surveyors and highway boards. The principle of making those who use the roads to an extraordinary degree pay for their special use has a good deal to be said for it, but if carefully analysed it would probably be seen not to be so sound as at first sight it appears. True, at present it is the law, and a law which is likely every year to become more burdensome to those who have to use portions of highways to an unusual degree for a special purpose.

Pneumatic Despatch. ALTHOUGH the pneumatic despatch system has been used in London for nearly half a century, its application has been confined chiefly to the post-office service, and the tubes employed are rarely more than 2½-in. diameter. The same system is applied in connexion with provincial post-offices for the conveyance of telegrams. In the United States the tubes are of far greater size, those installed between the New York post-office and the central station being of 8-in. diameter, while tubes of the same, and even of larger diameter, are employed in several American cities for the despatch of parcels as well as of letters. A proposal is now on foot to promote a Bill in Parliament to authorise the establishment of a pneumatic parcels service in London. Such a scheme, to be effective, would involve a very heavy capital expenditure, probably running into millions, but if sanction can be obtained and the money raised, the project would be of immense convenience, and should also have the effect of reducing vehicular traffic to a marked extent.

Manchester Ship Canal. FROM the half-yearly report of the company, it is satisfactory to learn that, in spite of unfavourable trade conditions, the seaborne and large traffic on the canal amounted to 1,903,833 tons in the first half of this year, as compared with 1,835,805 tons in the corresponding period of 1903. We referred in a previous "Note" to the Bill relative to the deepening of the canal, and are glad to find this measure will be passed before the close of the present Session. Another Act, which has already been passed, is of much importance, and confirms an arrangement between the Corporation of Manchester and the company, which will greatly facilitate the construction of wharves and dock accommodation at the Manchester end of the canal. The liberal support of the Corporation has

been of inestimable value in the past, and the new Act will still further benefit the company, shipowners, and traders alike. At the present time additional jetties are being built at various places along the waterway, spare upper gates are being provided for the 40 ft. wide locks, and additional plant is in hand for the No. 9 dock and the transit shed. These works will probably be completed in June, 1905. It will be seen that due attention is being paid to the requirements of traffic in every possible direction, and one most satisfactory circumstance is that the expenditure of capital in this manner has always led to increase of net revenue, which, for the past six months, amounted to more than 92,000*l.*

A Small Museum at Famagusta. AN interesting small museum has recently been created out of an old church in Famagusta, Cyprus, by the successful efforts of the new Curator of Ancient Monuments. It contains about 100 examples of the most interesting stone carvings of the XIIIth and XIVth centuries, some of which have been illustrated by M. Enlart in *L'Art Gothique en Chypre*, besides a quantity of old arms and armour found in the city at different times since the British occupation. There are also some curious relics of stained glass singularly preserved, in spite of the ruin of all the old churches at the time of the Turkish bombardment. This new institution will form an additional attraction for visitors to this most famous old city.

Vestiges of the Fleet River. IN excavating the site for a block of new buildings at the corner of Farringdon-street and Seacoal-lane have been found some relics of a time when the Fleet was navigable for small craft. At a depth of some 20 ft. were discovered a row of blackened oak piles, with camp-sbedding, which had been constructed to hold up the bank and to serve as a retaining wall for a wharf or quay formed of bricks and stones bonded with lime. The curve of the wharf up Seacoal-lane indicates that there was a creek or dock for the loading and unloading of barges and lighters that were plied on the Fleet near its junction with the Thames.

The Architectural Association Excursion. PARTICULARS of the thirty-fifth annual excursion of the Architectural Association, which is to be held in Sherborne and neighbourhood from August 15 to August 20, have now been issued. On Monday, the 15th, the party are to visit Trent Church, chantry and bouse; Sandford Orcas house; and North Cadbury Court and church. On Tuesday they will journey to Crewkerne, Beaminster, Melplash, and Parnham, and on Wednesday the bouse at Clifton Maybank and the bouse and church at Brympton are to be seen and Newton Surmaville visited. Thursday will be devoted to the following visits: Templecombe, Blandford, Milton Abbey, Piddletown, Waterson, Dorchester, and Yeovil. The party will again visit Yeovil on the following day, when the village and church of Tintinbull, Montacute House, and Preston Grange will be seen. On Saturday the excursionists will remain in Sherborne. The

Ion. Secretaries of the excursion are Messrs. W. Talbot Brown and A. W. Jennings. Second-class reserved compartments on the 2.55 train from Waterloo will be arranged for on Saturday, the 13th, and the headquarters of the excursion will be at the "Digby Hotel," Sherborne. Favoured by good weather the excursion should be a very successful one.

MAGAZINES AND REVIEWS.

TO THE *Art Journal* Mr. C. F. Bell contributes an article on a curious and interesting subject, that of the series of artistically-embellished "Oxford Almanacks," issued by the University annually since 1674, and of which we gather that complete examples still exist with the exception of that of 1675, the second of the series, of which no copy is extant. These Almanacks consisted each of a large sheet containing a time-table of University events for the year, which time-table, however, is quite subordinate, especially in the earlier examples, to the decorative treatment of the sheet. Reproductions on a small scale are given of a good many of the sheets, and very interesting they are, especially the older ones. The latter, according to the fashion of the XVIIIth century, are almost entirely allegorical and symbolic; the XVIIIth century examples that are given show rather mechanical and perspective views of this or that college, accompanied by imaginary or allegorical figures in the foreground; while, when we get to the XIXth century, allegorical and decorative character have been like dropped, and we find views of Oxford in landscape style, to some of which the great names of Turner and de Wint are appended. Turner drew the Almanack annually for some years, having been first appointed as artist at the age of twenty-five, before he was famous. Before he abandoned the post he had become a man of renown, but was not the less taken to task by the Dons for inaccuracy in his representation of some of the buildings which he took as the subjects for his illustrations—probably with reason, if accuracy was an object with them. In his younger days Turner was one of the most masterly and painstaking of architectural draughtsmen, but later the spirit of the landscape-painter, in search of broad effects, relegated architectural accuracy to a secondary place. In spite of the high artistic quality of the later landscape-painter's illustrations, and of the old-fashioned and (to us) eccentric character of some of the earlier allegorical designs, one cannot but feel that the latter were really much more the right kind of thing for the situation, being decorative in intent and effect, and showing a good deal of fancy and invention. The earliest one (1674) is very curious; the main feature is a circular building (in bad perspective), with a large arched opening in front and rear, with water all round it, and numbers of small allegorical figures swimming in the water, perched on brackets on the walls, or flying in the sky; the calendar is engraved on panels on the upper part of this building, and where the last one on each side would have become illegible from foreshortening, small flying genii have obligingly taken it out of its place on the wall and hold it up to face the spectator. Those for 1677 and 1680, both by Michael Burghers, are in a less naive style; a portion of the sheet is occupied by the Almanack, on a square symmetrical space, the remainder being occupied by symbolic figures and landscape, of some power of design. The point of the whole matter, and the reason we have commented on it at some length, is that the older artists of the Oxford Almanacks had a much better idea of the decorative treatment of an Almanack than those of the early XIXth century, and that, compared with the invention of decorative symbolical figures and compositions, the mere insertion of a view of a college or a street in Oxford is a prosaic and unintellectual proceeding. What is the class of work in favour at the present moment does not appear, as 1866 is the latest example given. The frontispiece to this number of the *Art Journal* is an admirable etching of "Hindhead," by Mr. Percy Robertson.

An article by Mr. Sturge Moore, in the *Burlington Magazine*, on "A Canon of Proportion for the Human Figure," is not rightly described in the title, since it only deals in a general way with the question whether such a

canon is possible or necessary, and with suggestions as to the real meaning of Abrecht Dürer's theory of proportion; viz.: that it was only a central or normal standard by which to measure differences or deviations from it, as required for artistic expression. But surely this is only the mere common sense of the matter; no one supposes that an ideally perfect or standard form is to be applied mechanically, as it were, to control all a painter's figures. To arrive, however, at a normal standard of physical proportion in the human figure is a matter of very great interest, and the article does not assist us to it, as the title seemed to promise. The article on "Old Moustiers Ware," translated from the original of M. Henri Frantz, is of real interest as making us acquainted with a once famous pottery ware in France of which the examples are scattered and difficult to come at; and the beautifully executed illustrations add to its value. A short article by the Editor on "Art as a National Asset" should be attended to. It seems a low view to take of art, to regard it as a power commercially valuable to the nation which possesses it; but it is nevertheless one form of the national value of art, as strikingly shown in the case of Italy and France. It is their art which brings to those countries multitudes of visitors who would otherwise not trouble about it; and this is a point which might appeal, perhaps, to that rigid sense of economy which characterises British legislators, who always look on public money spent on art as a form of extravagance. If one could get it into their heads that money spent in improving English art is likely in the long run to benefit the financial position of the country, perhaps even the House of Commons might take a different view of the matter. As the Editor says, one could not make the British nation artistic by an Act of Parliament; "nevertheless, a sound and systematic programme for putting good and bad art before the public with the prominence they respectively merit might effect a considerable improvement in their powers of discrimination." It is suggested that any attempt to help art and artists must include helping the public also, more especially by reorganising our galleries and museums so as to emphasise the distinction between good and inferior art. And in connection with such an effort comes in also the great importance of sound choice and judgment in such a matter as the purchases with the Chantry Fund.

In *Public Works* will be found some description of municipal work at Rouen and at Nice, and an article on "The Bridges of Berlin." This latter is of interest as a historical sketch of the development of bridge-building in Berlin, but the more recent and pretentious of the bridges are in the worst and most tawdry taste, both in their masonry and in their decorative iron-work. Some of the sculptural decorations are better—the bears on the pedestals of the Moabit bridge, for instance; but in general design the oldest bridge illustrated, the Kurfürsten bridge, is by far the best in point of good taste and propriety of architectural treatment. In fact, the progress of city bridge-building seems to have been much the same in Berlin as in London; the older bridges simple and monumental, the later ones pretentious and covered with florid and coarse ornament.

In *The World's Work* is an illustrated description of Dr. Barton's air-ship, which has for a long time been in process of construction at the Alexandra Palace, and which was to make its first trip during the present month. It is a very complicated construction; we hope it may be successful in carrying the problem one step further, and without fatal accidents; but one cannot avoid the impression that before any real success is arrived at in aerial navigation (and we believe success is probable in the long run) a great deal of simplification of the machine will have to be achieved. Each experiment, however, may be useful in showing how simplification can be arrived at.

The *Architectural Record* (New York) contains another instalment of Professor Goodyear's studies to prove that all the lapses from vertical line and rectangular setting out in mediæval churches were made designedly by the builders, and are what he calls "refinements" of architectural design. He seems to have got to the climax in the case of St. Quentin, where the crossing piers have all taken a bend outwards half-way up their length. That the position was regarded as dangerous is shown by the tie-rods, which Professor Goodyear evidently recognises as an awkward fact for his thesis,

but he dismisses them with the assumption that they were put in recently. If he had found evidence that they were ancient it would have made short work with his theory, and he has apparently not tried to get any evidence. He wants to know how piers could go 2 ft. out of the perpendicular without the vault falling in. Did he examine the condition of the vault? At Peterborough, as we all know, the piers have moved more than 2 ft. out of the perpendicular, but the vault did not actually fall in, though it was in a very precarious state before the recent restoration. We have no doubt, by the way, that if ever Professor Goodyear condescends to take English Gothic into his consideration (with American writers this is always a condescension), he will discover that the west piers at Peterborough were purposely built leaning outwards, and the choir piers at Salisbury leaning away from the crossing. But is it even necessary to consider this difficulty at all? If the tie-rods are ancient, as we surmise, the story told by the building itself seems to be this—that the thrust of the crossing arches and vaulting ribs began pushing out the piers, that tie-rods were then inserted and the arches corrected (perhaps taken down and rebuilt), and the filling of the vault inserted subsequently. It is a more reasonable explanation than Professor Goodyear's, at all events; for supposing that these piers had been deliberately built broken-backed, how is this an "architectural refinement?" On the contrary, it is one of the most clumsy, useless, and stupid things that could possibly have been done. There are a few undoubted cases in which buildings have been narrowed on plan towards one end in order to produce a false effect of increased length, but the widening of the piers at the upper portion would have the effect, not of increasing but of diminishing the apparent height of the building, and this at a time when French Cathedral builders were vying with each other in the endeavour to increase height! The notion is really too preposterous to do anything but laugh at, except to lament that a clever man should have got such a hee in his honour. Among the other articles in the *Record* is one on the work of Messrs. Rutan and Russell, who appear to be the leading architects in Pittsburg; we cannot say that we are struck by any very remarkable quality in their buildings as here illustrated; the large Hotel Schenley is a simple and massive treatment of a large hotel block, but it might have been made a good deal more attractive without losing simplicity. Mr. Charles de Kay's article on "The Future of Decorated Metals," which runs here into a third chapter, seems intended chiefly to introduce illustrations of American metal work; some of these are rather commonplace, and have more apparent relation with the past than the future, and the wrought-iron electrolier on page 151 is a piece of very bad naturalism; but we are grateful for the illustration of the bronze stairway in the Chicago Public Library, a good translation of a classic stone ideal into bronze form; we should have been glad to have had some details of that. The designer's name is not given.

By far the best thing illustrated in the *Berliner Architektur-Welt* is an example not of architecture but of sculpture—a funeral monument by Herr Von Dammann, consisting of a perfectly plain square stele, with an inscription cut so as to form a decorative square on the surface, and a heavily-draped female figure seated on the top of the stele, with one hand up to her chin, in an attitude of musing. There is a dignity and repose both of line and expression about this which we do not often see realised in German sculpture. Among the architectural designs illustrated the most noticeable is a lake-side restaurant, of which MM. Berndt and Lange are the architects; an erection of very fanciful character, not unsuitable for a building of the kind, and with some good application of sgraffito decoration in the interior. The number contains an essay by Dr. Hans Schmidkunz on "Kinderlust und Stadtbausehmerz," beginning with considerations on the difficulty of finding safe and adequate playing-space for children in towns, and going off (rather illogically) into a Utopian scheme for three-story streets in cities, one for heavy traffic, one for quick traffic, and one for various purposes (including apparently the children's sports). Proposals of this kind, besides being, on economic grounds, outside the region of practical politics, would result in conditions absolutely unhygienic as well as

inconsistent with anything like nobility of effect in city architecture. Proposals of the same nature have been made in England, concerning which all one can say is that their authors, to overcome a minor inconvenience of crowded traffic, would inflict on cities an expensive and permanent disfigurement and loss of air circulation.

The *Architektonische Rundschau* does not contain this month a single design worth remark except one on which we have already commented in reference to an illustration which appeared in the *Berliner Architektur-Welt*.

The *Quarterly Review* contains an article under the title "Recent Lights on Ancient Egypt," a collective review of various recent works on the subject. We do not understand why M. Choisy's "L'Art de Bâtir chez les Egyptiens" is not included among the list of books at the head of the article, although it is the subject of some two pages of special comment in the course of the review. The article is a good comprehensive summary of the present state of our knowledge of Egyptian art and history, and concludes with an expression of the opinion that, amid the great and rapidly growing bulk of material for Egyptian study, aency of observation and of interpretation, "which also means distinguishing clearly between fact and conjecture," should be especially aimed at. "If leading scholars would bear this in mind, their books would be either fewer or smaller, and each contribution would mark a definite and positive step in the advance of knowledge." The number also contains an article on "Giotto and Early Italian Art," ostensibly a review of the new edition of Crowe and Cavalcaselle, edited by Mr. Langton Douglas, assisted by Mr. S. A. Strong. We gather that the editor has taken a different line from the authors, who regarded Giotto as essentially Florentine and a follower of Cimabue, while Mr. Douglas regards Giotto as essentially Roman in his artistic descent and education, and dismisses Cimabue as a myth. As we have before taken occasion to remark, this attempt by some recent art-critics to deny the influence and even the existence of Cimabue as a painter is absurd in the face of Dante's explicit reference to him as the head of painting in his day; Dante was too close to the period to have mistaken a myth for a man. The summary of Giotto's position in Italian art, at the close of the article, is eloquent and written in a true spirit of criticism.

In the *Monthly Review* Mrs. Ady writes an article on G. F. Watts which very adequately represents the feeling with which the nobility and steadfastness of Watts's life and his artistic aims must be regarded by all seriously thinking people. But as a critical review the article is pervaded by the same kind of mistake—a mistake of a noble nature, no doubt—which pervaded Watts's own view of art. Watts, in his later years at all events, made too much of the didactic element in art, to the manifest injury of the artistic element; and Mrs. Ady is so much occupied with the moral greatness of Watts's life and character (in which we are entirely in sympathy with her), that she seems rather to regard this as assuring the artistic greatness of his works. She quotes, we observe, the French critic M. de la Sizeranne, as having confessed that "the works of this English master had first made him believe in symbolic painting." Something like this may be deduced from de la Sizeranne's remarks, but those who refer to what the French critic actually said about Watts, in his book "La Peinture Anglaise," will see that this representation of his opinion is hardly accurate. We have not the book at hand at the moment for quotation; but we remember that de la Sizeranne emphasised very strongly his opinion as to the mistake of making painting into a sermon, and complained that Mr. Watts had been "le bourreau des tous nos joies" in art. The mistake of moral painting is that the moral dies, the art remains. Watts was a much nobler character than Titian, but Titian was a much greater painter.

The *Fortnightly Review* contains an article by Mr. W. B. Woodgate on the important question of the proposed Thames Barrage, with special reference to the essay by Mr. Barber in *Public Works*, which we have before commented on. Mr. Woodgate's article is a very important and thoughtful one, and should be read by those who will be officially concerned in settling the question. His opinion, which is the same as we heard long ago from one of the oldest and most experienced of river and harbour

engineers, is that the stoppage of tidal action at Gravesend, which would be the result of the barrage, will only have the effect of removing the difficulty as to water to a situation lower down; in other words, that the Thames at Gravesend will then be under the same conditions (relatively) as the Thames at Teddington now is, and that we shall have less water at low tides at Gravesend, and more silt, than now exists. Considering the enormous expense of the work, and that once done it cannot be undone, the most serious consideration of the problem on all sides ought to be given to it before anything is decided on.

In *Scribner's Magazine*, under "The Field of Art," Mr. Ernest Flagg, the well-known architect, writes an article on the deficiencies of the plan of New York, with a grand scheme for a city improvement, consisting in driving a great central avenue 160 ft. wide right along the centre or back-bone of the city; a block plan of the scheme is given. Mr. Flagg makes suggestions in regard to sale or exchange of sites which he thinks would make it economically feasible; of that we cannot well judge; but that the scheme would be a grand one there is no doubt; the plan speaks for itself.

In the *Century* an article on "The Summer Splendour of the Chinese Court" is accompanied by some illustrations of the architecture in connexion with the Summer Palace (twelve miles from Peking), which are of some interest, and include a view of a pavilion pier built in the form of a marble boat; a fancy which reminds one of the Roman treatment of the island in the Tiber.

Harper includes an article, rather historical than architectural, on Château Gaillard, with effective but rather sketchy illustrations. The number also contains a short but most important article by Sir Oliver Lodge, "Electric Theory of Matter," to which we may return.

The *Gentleman's Magazine* includes the first part of a lengthy and carefully-studied essay on the Roman remains at Fréjus, the ancient Forum Juli.

The *Antiquary* includes an article by Mr. Thomas E. Maw on "The Church Libraries of King's Lynn," a collection of books in the Stanley Public Library of that town, and which goes by the name of "The St. Margaret's Church Library." On November 4, 1631, it was ordered "that fifty pounds be bestowed by the Mayor and Burgesses towards the furnishing with hooks of the Library in St. Margaret's church." The article describes some interesting books in the collection, with illustrations of two cuts from the Hall Book. Mr. MacMichael's essay on "London Signs and their Associations" is continued.

Knowledge contains an article by Miss Clarke on "The Inevitable Ether"—inevitable, because the mechanism of the universe appears to be inexplicable without it. Astronomers and physicists seem to be coming to a certain unity of thinking in regard to the ether, which however, so far, seems to be only a name for a condition of space which we can only appreciate by its results. Fifty years ago people talked of the "electric fluid"—an idea now only relegated to the ages of faith. Possibly fifty years hence the term "ether" may have become equally antiquated. The same number contains the first chapter of a practical essay on "The Temperature of the Air" and the means of observing and recording it, by Mr. William Marriott, and an article on "The Later History of the Horse," which we refer to because two engravings, representing the horse in Assyrian art and the horse in Greek art, have got the titles transposed, the Assyrian picture being described as Greek, and vice versa; which indicates a want of "knowledge" on the part of some one.

ROMAN NOTES.

THE excavations in the Forum are still proceeding, but no discoveries of great importance are announced as having been made since the writing of my last article (*Builder*, July 23, p. 88).

On the south-west side of the Lacus Curtius, a well of the Republican period, of the oldest type, has recently been explored; it was excavated in the hard subsoil, with footholes for descent, and not lined with tufa slabs, like the wells of later date. The upper part of it was filled with lumps of tufa; at the bottom were found three skeletons of large watchdogs, together with fragments of archaic terra-cotta antefixæ. The exploration of the lower strata

near the base of the equestrian statue of Domitian is not yet complete. (*Tribuna*, July 11.)

The problem of the Via Cavour has been examined by a Commission appointed by the Ministry of Public Instruction, and its report which has been drawn up by Comm. Boni, has just been published. It was originally intended that the Via Cavour—a comparatively new street descending from the railway station—should cross the open area of the Forum by a bridge superseding the present road which runs on a viaduct between the arch of Septimius Severus and the Capitol, and cuts off the temples of Concord and Vespasian from the rest of the Forum, thus ruining the view of the north-west end of it. But the recent extension of the area of excavation has rendered such a bridge almost impossible, while, owing to the removal of the street which passed in front of the Curia and covered the site of the Comitium, the present road has become more inconvenient and dangerous than ever, owing to its narrowness and the sharp curves which it makes, and, being an important artery of communication (as a glance at the plan of the city will show), it has a good deal of traffic to carry.

The Commission does not discuss this point but contents itself with recommendations with regard to the Via Cavour—which, it may seem, seems to be agreed on all hands, only be carried to the Piazza Venezia, and under no circumstances across the Forum.

The municipal engineers desired to take it close to the back of the Curia (now the Church of S. Adriano) and across the site of the temple of Venus Genetrix, which occupied the centre of the Forum of Caesar. But the Commission's report urges that the sites of the Imperia Fora, which are to a considerable extent covered by modern streets and buildings, should be respected (in order not to prejudice the possibility of their eventual exploration), and that the new prolongation of the Via Cavour should keep on the north-east side of the Forum of Augustus, and then run round two sides of the Forum of Trajan to the Piazza Venezia. From an archaeological point of view, there is everything to be said for the recommendations of the Commission, though the engineering difficulties may be considerable, inasmuch as the slope of the Quirinal come right down to the north-east side of the Imperial Fora, the hemicycle of the Forum of Trajan being, indeed, built right against the hill.

An interesting discovery has been made in the Church of S. Maria Maggiore, by Sig. Arduino Colasanti. (*Tribuna*, July 12.) On the upper part of the walls of the basilica, above the present flat gilded ceiling, which was completed by Pope Alexander VI. (1492-1503), are remains of frescoes which appear to belong to the end of the XIIIth century. On the two sides of the walls of the nave, and on the upper part of the wall over the triumphal arch, are the busts of Saints on a blue ground in large medallions while a medallion on the south-east wall, over the main entrance, has a representation of the *Agnus Dei*. Above these medallions is a line of small arches, shown as if constructed in coloured marbles, and resting upon pilasters, with acanthus leaf capitals; and above these again a line of rosettes between red and yellow bands.

These frescoes are works of considerable power, and, though inspired by classical models, are by no means lacking in life and vigour while they reveal careful calculation on the part of the artist of the effect that they ought to produce at a considerable height above the floor level. They possess the characteristic of the Roman school of the latter half of the XIIIth century, and present several points of similarity with the frescoes of Pietro Cavallini in S. Cecilia in Trastevere, discovered only two or three years ago, and unluckily quite inaccessible to the public, situated as they are in the nuns' choir.*

We know, too, that Pope Nicholas IV. (1288-1292) restored the church of S. Maria Maggiore; indeed, the mosaics of the apse were executed by his order, and in them he appears as an adorer of the Virgin at her Coronation; while an inscription set up by him recorded that "he restores the Virgin's ruined fame, and the old church is made new."

On the other hand, Sig. Colasanti notices that the frescoes of S. Maria Maggiore are less fine in execution than the other known works of Cavallini, and declines to pronounce a decided

* Cf. Hermann in *Gallerie Nazionali Italiane*, I (1902), 61.

pinion as yet. In any case, the discovery is one of considerable importance for the history of the evolution of Italian art.

THOMAS ASHBY, JUN.

BEAR-YARD AND ARCH-ROW, LINCOLN'S-INN-FIELDS.

THE houses in Bear-yard and Portsmouth-lane, a passage leading from the yard into Lincoln's-inn-fields, with some in Portsmouth-treet, are being pulled down. One of the houses, No. 2 in the street, formerly Louches-buildings, and now named Lincoln's-inn-fields Chambers, is noteworthy as being the last remaining house of Arch, or West-row, built by Inigo Jones, that has retained its original front in red brick, though the top story is a subsequent addition, seemingly, for the attic above the blocking course. The three pilasters have ionic capitals with hanging wreaths or swags; the middle one has an ornamented band bearing fleur-de-lis; on the similar bands of the two other pilasters are roses displayed. Those roses, carved in stone, commemorate the act that when Inigo Jones laid out the Cup, or Cop, and Purse-fields, under the commission issued in 1618, he began on the west side, including part of Great Queen-street, the site of the Pightells and Purse-fields, which belonged to the jointure of the Rose and Lily Queen, Henrietta Maria. Jones made an archway across the end of Foriue, or Fortifue-lane—now Sardinia, formerly Duke-street (1648)—leading from Fyckett's-fields through the Purse-fields, and so alongside Fortifue-garden to the Via de Aldwyche, now Drury-lane. The elevation of the house we cite gives some idea of what the whole row was originally like under his hands; for of the remaining houses six—namely, Nos. 50A, 50, 56, 62-3, and 65, have been re-built, and of five, Nos. 51-2-3, 61, and 64, the fronts have been changed and stuccoed, whilst Nos. 57-8, one house, has a stone front apparently of a later time, and Nos. 66-7 is Newcastle House, built by Captain Winde, a scholar of Jones's pupil and executor Wehh, for the Marquis of Powis in or about 1686. But the pilasters remain of Nos. 51-2, 54-5, and 64, and in three houses of that group they still carry the rose and fleur-de-lis devices. On October 22, 1898, we illustrated the rare silver medal, by George Bower, struck to commemorate the pillage and burning on the night of December 11, 1688, of the Franciscans' Chapel in Duke-street, since the Sardinian chapel or church of SS. Anselm and Cecilia. The medal, presented to William and Mary on their accession, bears on its reverse a beautifully wrought relief showing Arch-row with its old elevations, the forecourt walls with their gate-piers, and the wooden posts and rails of the square wherein the Protestant mob are burning crosses, etc., from the chapel, which with the Friars' house, now No. 54, the Presbytery at the arch-way, is depicted as in ruins. There, as at Covent Garden, Inigo Jones's designs were not carried out in their entirety; a plate, attributed to Hollar, was found a few years ago by Mr. H. Fancourt, of Highbury, which, as he considers, delineates the architect's original designs, whereof only that for the west side of the square was completed as he had intended. Timbs records that Inigo Jones built Portsmouth House in the south-west corner of the Fields "for the Earl of Portsmouth." The so-called "Old Curiosity Shop" of Charles Dickens is a reputed relic of the Duchess of Portsmouth's dairy-house; the Ordnance Survey marks Portsmouth-place as being the site of Portsmouth House.

The inner square of Bear-yard is the site of Charles Gibbons's tennis court, opened as a theatre by Killigiew and the King's company on November 8, 1660, with a performance of "King Henry IV." The remains of that play-house, which should not be confused with the adjacent Duke's Theatre, in Lisle's tennis-court, Portugal-street, were discovered after a fire on September 19, 1809, and are illustrated in Wilkinson's "Londina Illustrata." Some slaughter-houses erected on the site gave way fifteen years ago to the casual and receiving wards of the Strand Union, built after designs by the late W. S. Cross.

POLICE BUILDINGS, SEDGLEY, WOLVERHAMPTON.—The new police buildings at Sedgley were opened recently. The plans for the work were prepared by Mr. Chadde, the County Surveyor, and Messrs. H. Gough and Sons, of Wolverhampton, were the contractors. The total cost of the buildings was 5,000l.

BRAUWEILER ABBEY.

SITUATED at about a mile from Königsdorf Station, near Horrem, and at about half an hour's train journey from Cologne, on the Aix-la-Chapelle line, this striking church attracts the attention of the traveller on account of its splendid grouping of towers, lantern, and lofty spire, and its commanding position on the top of a hill overlooking the great expanse of flat country below.

The first structure on its site was a timber chapel of small dimensions discovered by a rich man in a wood, and consecrated to St. Medardus. The Count Palatine Hornmann, whose castle stood at Branweiler, caused the chapel to be rebuilt in stone, and this was consecrated by Archbishop Warinus of Cologne (976-85). The Count's son and successor, Ezo, who married Matilda, daughter of Otto II., resolved to build a monastery at Branweiler, and on April 14, 1024, the foundation-laying was performed, a little to the north of the site of the little chapel, by Archbishop Poppe von Stahlo, and Archbishop Pilgrim consecrated the church on November 8, four years later.

In 1048 it was necessary to enlarge the church and buildings, and Abbot Elio laid the new foundation on June 30 of that year. The third abbot, Wolfhelm (1065-91), richly decorated the church, and finished the fabric.

About the middle of the XIIIth century buildings around the church were commenced, and in 1141 an altar was dedicated in the west tower, to St. Michael—apparently a not unusual place in churches in Germany for altars to that saint.

The aisles were also vaulted about then, and several columns erected and others strengthened in the nave, with buttresses outside. No definite plan seems to have been followed for a while, the old work and the new mingling curiously, and new work extending west without being finished. About 1196 Abbot Bertram of Anrath planned an extension of the church, and raised funds in the Cologne diocese for the

work. The next abbot (Godesman) continued his predecessor's labours, and in 1200 the whole of the east end was rebuilt, from east of the choir to the transepts, the choir being extended 12 ft., but the old crypt was not altered. In the same year three new altars were consecrated in the crypt.

The works were left, in 1226, unfinished, the south turret of the tower being only at part of its height, and covered with a provisional roof. The northern one was less high, and was later on lowered to about half the height of the choir and the foundation of the west tower was laid, but not more.

An organ was placed on the north side of the church at the end of the XIVth century.

In the XVth the original vaulting gave place to a Late Gothic one, shortening the interior by 4 ft., but raising the nave by that amount.

In a great storm in 1606 the west tower fell in and greatly damaged the roof, and the steeple was restored in 1629.

A decree of Napoléon, in 1802, refounded the Abbey, and in 1806 the church was made parochial. Since 1815 the buildings have been government property, and are now a reformatory and house of correction. The paintings and altars and carvings, as well as the beautiful cloisters, are alone worth a journey to go and inspect.

The restoration of the church was commenced in 1860, and the works were practically completed in 1895.

J. A. R.

IRONWORK IN THE SAVOY HOTEL EXTENSION.

THESE two drawings show some of the wrought-iron work halustrading carried out at the Savoy Hotel Extension by Messrs Starkie Gardner, from the designs of the architect, Mr. Colcutt. They form good examples of work of the kind which has character and interest without eccentricity.

The railing along the cornice is a large piece



Iron Railing along Cornice, Strand and Savoy Court Elevations.



Railing between Columns of North Wall (South Block).

Ironwork in Savoy Hotel Extension.

of work, as when finished it will extend from the eastern end all along the Strand frontage, returning along Savoy Court, and it is then carried to the western extension round Herbert's Passage, finally ending on the south side of the building; a length in all of nearly 500 feet.

SANITARY FITTINGS.*

In bringing before you once more the question of Sanitary Fittings, which has so often been discussed at your meetings, I confine myself to those connected with the most economical and common-sense method of disposing of sewage, the water-carriage system. Till a comparatively recent period all water-closets were, as a rule, placed in the darkest and most out-of-the-way corners, shut off alike from light and air, and with no escape for the effluvia except into adjoining rooms; a state of matters only, alas, too common still. Water-closets, baths, lavatories, and sinks were, besides, all connected with the same soil-pipe, and were also inclosed in wooden linings which soon became sodden with filth, and gave off most offensive smells; water cisterns and storage tanks were placed where they were bound to receive foul gases from closets and drain-ventilating pipes; and the ground underneath the house contained a perfect net-work of soil-pipes. Now, all this was exactly the opposite of what ought to be the case. In an ideal building all fittings and drains should be designed and arranged so that waste matter of every kind may be carried outside as quickly as possible, and the necessary rooms and appliances should be so placed against outer walls that they may receive the maximum amount of light and air.

Baths.—These, for public or for the best private work, should be of enamelled fire-clay; but for general use, the material most to be recommended is cast-iron porcelain-enamelled, i.e., with the inside coated with white porcelain enamel which is practically incorporated with the iron by fusion in a muffle furnace. Almost equally good is cast-iron vitreous-enamelled, where the coating is coloured instead of white. Confusion has arisen between the two, but the difference is of colour rather than of kind, the essential constituents of the coating, and the methods of application and manufacture, being the same in both. Porcelain enamel is more costly, not so much because it contains a larger proportion of silica and is more durable (though this is the case), as because it is more readily soiled by dust specks, etc., in the process of manufacture. The white coating has, on the other hand, the recommendation of readily showing dirt, and therefore of promoting that cleanliness so necessary in connexion with sanitary appliances. The inferior quality of some of the earlier porcelain-enamel raised a prejudice against baths of the kind; but nowadays the improvements in making and firing that have been introduced render the goods of any high-class manufacturer thoroughly trustworthy. The metallic enamelled and japanned baths, so common in this country, are not to be recommended. The surface, merely a superior kind of paint, very soon becomes discoloured, and gives way under the action of soap and hot water. What the porcelain-enameller aims at is such an adjustment of fluxes and silicates as will give a coating that cannot be affected by any ordinary means.

Every bath should have a roll-top edge to throw off moisture, should be raised on feet, and should be set out from the walls. It can thus be kept thoroughly clean all round and underneath. After use it should always be rinsed out with clean cold water applied by a sponge or clean cloth. Bath-rooms should be well lighted and ventilated; and they should also be properly heated by means either of radiators or of hot-water towel drying racks.

Closets.—Every closet should have floor and walls alike of impervious material—marble, mosaic, tiles, enamelled-brick, endeca (that is, enbossed zinc sheets enamelled), or cement. Cement or plaster walls should be painted and varnished; or where, for cheapness, they are hung with American cloth or paper, the former should be painted and varnished and the latter varnished. Any wood used should be hard wood. Closet traps should, if possible, be what is called the P pattern, and should, if at all long, be separately ventilated. If the outlet require to go through the floor with an S trap, this ought to have a 2 inch ventilating connexion.

* Part of an abstract of a paper read by Mr. John Shanks at the Sanitary Institute Congress in Glasgow.

Closets should never have wooden inclosures; the only wood necessary is the hinged seat, and this should be connected directly with the pedestal. The pedestal itself should stand at least 6 in. clear of the wall, so that it may be possible to sweep and wash all round. The pan and plug and the two-piece hopper closets may be said to be entirely gone, and the wash-out is, in consequence of its large soiling surface, fast following them; but, of the older types, the valve, or Bramah, pattern still holds its ground, and is, if properly made and fitted, a good enough arrangement. The most modern types are the wash-down and the siphonic; and either of these, of good design and properly fitted up, should give complete satisfaction.

Storage Tanks and Flushing Apparatus.—For perfect efficiency all houses ought to have storage tanks to furnish a supply for every purpose except drinking—drinking-water should always be taken direct from the main. These should be placed in the highest part of the building; should be of large capacity; should always have good-sized supply valves and overflows; and should have tight-fitting covers to prevent dust from getting in. They should be cleaned at least twice a year, and should have, on the pipe leading to the various fittings, a full-way, screw-down, stop-tap, to enable the supply to be cut off for repairs, etc. The actual flushing process may be accomplished in three different ways:—(1) By what is known as a regulating supply valve, fixed over, or at the side of, the water-closet, and fed from the storage tank referred to. Regulating valves of good construction are noiseless, and with a good and ample water-supply very suitable and convenient. (2) From a cistern $\frac{1}{2}$ ft. to 6 ft. above the closet. (3) From a cistern immediately above and behind the closet. Cisterns fitted some distance above the closet should be placed directly over the pan; and the connecting pipe should be, by preference, of brass or copper, straight, or with as few bends as possible, from 4 ft. to 6 ft. long, at least $\frac{1}{2}$ in. in external diameter, and set at least 1 in. clear of the wall. The centre window so common in closet-rooms may perhaps interfere with this arrangement, but if the tank be fitted above the window the pipe can still be carried straight down. If the cistern must be placed at the side, care should be taken that the discharge pipe has as few bends as possible, since these create friction and diminish the force of the flush. Cisterns vary greatly in shape and design, and over no sanitary fitting does more grumbling arise, sometimes on the ground of noise, and sometimes on the ground of bad quality. Here again it is largely a matter of price. If purchasers be willing to pay, they can have an article that will last, and that will work with comparatively little noise. The best materials are those least affected by corrosion—porcelain; enamelled fire-clay; cast-iron, glass-enamelled internally or porcelain-enamelled inside and outside; or wood, lined with lead or copper. Cisterns placed immediately above and behind the pan, though at first looked on with considerable disfavour, have proved very successful. A regulating stop-tap renders them almost noiseless, the larger inlet more than compensates for the lack of height pressure, and the greater quantity of water washes the basin, clears the trap, and flushes the drain in a perfectly satisfactory manner.

Sinks.—Sinks are, of all our sanitary appliances, those that probably receive least care and attention. Many people seem never to consider, or else readily to forget, that badly-fitted and foul-smelling kitchen and scullery sinks may cause serious pollution of cooking-pans, dishes, and cutlery, and even of food itself. These appliances should be made of strong fire-clay, white glazed all over, with round edges, and with no woodwork settings or casings of any description whatever. A loose teak-wood grating may be placed in the bottom to prevent the breaking of crockery, or damage to the enamel from saucepans, etc.; but even here a wire cage is perhaps better. The large drain boards at the sides should be covered with tinned or nicked copper. Sink and boards should be supported on cantilever brackets. The trap, discharging through the wall so as to leave the floor quite clear, should be of glass-enamelled cast-iron, as lead is much more liable to injury from external violence. The waste and overflow pipes should be large. If the sink be placed a few inches clear of the wall, the latter should be lined with white glazed tiles extending from the floor to 12 ins. above the top of the sink; and if it be placed against the wall

there ought to be a glazed fire-clay back at least 12 in. high. All angles, crevices, and sharp corners should be scrupulously avoided.

The absolute necessity of using the highest class of sanitary appliances, of having these arranged and fitted up in accordance with hygienic laws, and of following the best skilled advice that can be obtained, are matters that cannot be too strongly or earnestly impressed on the general public.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—Some members of the Manchester Society of Architects recently made a three days' visit to Oxford. Arriving on Friday night, the whole of Saturday was spent in visiting the Town Hall and six of the colleges. After service on Sunday at the Cathedral, the new church for the Cowley Fathers was seen. The afternoon was spent in punting down to Ifley, where some hasty jottings were made of the famous Norman church and of the charming old rectory. Monday was devoted to sketching at St. John's or Magdalen.

Books.

Modern Cottage Architecture. By various architects. Edited by MAURICE B. ADAMS. London: B. T. Batsford. 1904.

No book could possess a title more alluring to architects than this work, for no subject lends itself to illustration more attractively than cottages. There is, however, such endless variety to be met with in these smaller dwellings that it becomes necessary to hold some principle or aim in view which will exercise restraint in the selection of examples, an element which is lacking in the publication under notice.

Here is a collection of fifty exterior views reproduced from various well-known architects' drawings, prefaced by "Notes Concerning Cottage Building," by Mr. Adams. Numerous plans are given, but the selection is wholly one of picturesque designs for lodges and cottages gathered from a wide range, with no other object than illustrating certain excellent buildings produced in recent years. No single type of dwelling predominates, nor does the book serve to indicate the tendency of present-day cottage design.

The preface emphasises certain difficulties which beset the path of the cottage builder, consequent upon the economic conditions of our times; but the illustrations do not attempt in any way to present solutions of the problems. The author avoids all reference to questions of cost, which is generally the first factor in the erection and maintenance of this kind of property. Little is said about the types of plan necessary to produce inexpensive or artistic designs, and, practically speaking, the question of interior treatment is omitted entirely.

Much useful information is given in the preface, together with some practical hints upon matters of detail. But a book of this description should be ahead of the times. Reference is made briefly to the septic tank treatment of sewage, which is more suited to larger houses, but no information or suggestions are given as to "surface" disposal of wastes, such as is found most convenient and simple for cottages in country places. Ferro-concrete is lightly touched upon, but it is one of the few methods yet in vogue which will, in course of time, help to overcome the financial difficulty of the problem, when brought more into general use. Papering is recommended in preference to the distempering of walls, which we do not think meets with general acceptance.

Taken as a whole, this publication is an interesting record of some excellent cottage architecture of a good class, but we do not anticipate that any direct purpose will be served by its appearance.

Bayeux Cathedral. By REV. R. S. MYLNE. Bell: Cathedral Series. 1904.

This little handbook will be useful to visitors to Bayeux and the neighbourhood. It contains much information about the cathedral, and useful references to the churches of the district. No mention is made, however, of the great and important abbey-church of C  risy-la-For  t, which is within an easy bicycle ride; Ouistreham also deserves detailed description. The illustrations from French photographs are

admirable; equally bad are those by some amateur, taken with a snap-shot camera without rising front or swing-back; those of Haon and Ryès, with all the windows lurching inward towards the central tower, are particularly discreditible. In another edition the writer would do well to consult more recent authorities; especially Ruprich-Robert's "D'sours à la Société des Antiquaires de Normandie," 1882. He would also do well to consult Viollet-le-Duc's "Dictionnaire Raisonné," I., 360, where he would learn that the architecture of Bayeux choir is no more French than that of Lincoln or Salisbury. The book differs from the rest of the series in possessing an introduction on the principles of Gothic architecture. This needs considerable revision. We are told that if a Gothic vault falls, it will crush all the pillars and arches below. How is it, then, that the piers and arches are all standing at Tintern? The vaults fell long ago. There is also a little too much sermonising, and not always good sermonising—e.g., we are told that the combination of Norman arcade and Gothic derestory in the cathedral nave is "so beautiful in every way that in gazing hereupon a deep sense of spiritual repose is had over the soul of man." This sort of thing is not wanted in an archaeological handbook.

Ancient and Modern Furniture. By JOHN W. SMALL. Stirling: Eneas Mackay.

We have seldom met with a book the title of which was more misleading. The author should have called it, surely, "Furniture, Ancient and Modern." The section on modern furniture consists exclusively of illustrations of his own designs, or, as he says in the preface, "examples of modern furniture which during the last few years have been designed and executed for manufacturers and others from full-sized drawings supplied by the author," though what he means by "designing from full-sized drawings" we are at a loss to imagine. Not content with the profuse illustration of his own work, the author naively tells us of one piece that "it forms a very imposing piece of furniture," and of another "that it has had great success on the market, as fast as the number made can be taken as a test"; and the reader is tempted to exclaim that he can well believe it.

It is only just to add that the illustrations of old furniture are well and carefully done, and often of great interest; but they are far too few for a book which does not profess to deal exclusively with any particular period. Had the second section been illustrated with the same fragility from the best examples of modern work it might have been of some value and interest.

Andean Innocents in Spain. By F. E. SIDNEY, F.S.A. London: Simpkin, Marshall, Hamilton, Kent, and Co., Ltd. 1903.

How comes it that Spain fails to make herself attractive to the tourist? Why does not that class, English and American, that visits Italy, make a diversion by crossing the Pyrenees? The climate is not, it is true, so agreeable as the climate of Italy. But there is much beauty in the later spring and autumn. The matter of language is but a superficial difficulty, and is not a serious bar to travel nowadays. Spanish architecture and painting are of unquestioned interest. The characteristics of the people are various and picturesque. Yet, despite everything that may be urged, Spain fails to appeal to the popular imagination. She has produced—and we think the reason of her failure lies here—no great personalities that touch the common sentiments of humanity. She has neither a Michelangelo nor a Savonarola. In the place of the one she offers us Velasquez, whose talents, however pre-eminent, can reach but the few. In place of the other we have the spirit of the old Iberian fanaticism that found outlet in the Inquisition—the Iberian ferocity that still holds carnival at the bull fight; a legacy recorded upon the frescoes of the Palace of Minos four thousand years ago, marking the trail of this tribal migration from the shores of the Black Sea.

Much of the neglect of which we speak is due, no doubt, to the scantiness of a literature calculated to inform. George Borrow's "Bible in Spain" still remains a classic. Richard Ford's "Gatherings in Spain" and the guide-books he compiled for Murray provide information of attractive interest. George Edmond Street has given us his "Gothic Architecture in Spain," wherein he laid hold of the vital elements of

her architectural development, following the growth of the Romanesque and Romantic periods in the north, rather than the accidental creations of the Saracen at Seville and Cordoba. At the same time it may be questioned whether Street was entirely fitted to do justice to the licence by which the Spanish builder sought and found the picturesque. Finally we should not forget to mention Lord Leighton's admirable estimate of Spanish art, contributed in a lecture to the students of the Royal Academy. Yet our information must be considered meagre. And so to fill the void, pleasant and communicative travellers describe to us the Alhambra, the Alcazon, and the bull-fight, while they trust to the camera to fill up the blanks. Mr. Sidney in no way falls below the standard of this class of production. We would point out, however, that if the Saracen element in architecture is to be exclusively admired, the home of this, and of its purest examples, may be sought for in the French North African province of Mauritania. The Tower of Mousourah at Tlemcen is perhaps one of the finest towers ever erected in any style.

Stained Glass. By LEWIS F. DAY. London: Chapman and Hall, Ltd. 1903.

This small book of just over 150 pages forms one of the Art Handbooks to the Victoria and Albert Museum, and is published for the Board of Education. It is a capably written and illustrated guide by a well-known authority on a most fascinating subject, and the opportunity has been wisely taken of illustrating the book with examples for the most part from those in the Museum, and, as is explained in the preface, of drawing attention to the fine series of tracings now in the Art Library made by the late Octavius Hudson. The author traces the history of stained glass in its various forms from Early Gothic to Renaissance, and at the end of the work is a useful inventory of the examples in the Museum, arranged as far as is possible in order of date. The illustrations are throughout excellent; particularly good are some of the examples given of XIVth century quarries and grisaille. Equally interesting in their way are the reproductions in Chapter VII. of Renaissance drawings for armorial and domestic glass.

Dunstable: its History and Surroundings. By WORTHINGTON G. SMITH. London: Elliot Stock, and the Homeland Association, Ltd. 1904.

This forms Vol. III. of the "Homeland Library," and contains a very full account of the chief points of interest of this historic Bedfordshire town, and much information concerning the prehistoric remains, natural history, geology, etc., of the almost equally interesting district of which it forms a centre. Three chapters are devoted to the fine fragment of the nave of the Priory church, illustrated with two plans and photographs. One plan shows the arrangement as in 1850, and the other includes a conjectural restoration of the monastic church and cloister. Much no doubt of great interest would result if the site of the presbytery were examined; and, unlike many such sites, it is free of obstructions, and has not, we believe, been built upon. Although much has been removed at various times, as in other cases of the kind, sufficient should remain to give us a pretty accurate idea of how this fine church was arranged. The author contributes more than one careful drawing towards the illustrations, but the majority are from photographs. A very beautiful pulpit and canopy at Edlesborough is one of the best. Two excellent maps of the town and district are placed in a pocket at the end of the book, and help to complete a very interesting and carefully-prepared monograph.

Slingsby and Slingsby Castle. By ARTHUR ST. CLAIR BROOKE. Methuen and Co. 1904.

THE Rev. A. S. Brooke has printed in a good and convenient style the records of his parish, his church, and the adjacent manor. It was not written, we may suppose, with the idea that it would be widely read; but it should appeal to those who dwell in the historical neighbourhood to which the records refer; and it is certainly very desirable that such records should be written. We noticed some little while since, we remember, a "History of Litton Church," compiled by its Rector, a similar class of work of unquestioned interest, although the interest was for the most part a local one.

Antwerp: an Historical Sketch. By WILFRED C. ROBINSON. London: R. and T. Washbourne. 1904.

BYZANTIUM—Venice—Antwerp, these are the centres around which the modern world has revolved, for we must include its commercial with its social progress and with those interests which develop with society. Indeed the development of the arts have always run concurrently with commerce. We wish we could add that the converse were equally true.

Antwerp—the city on the wharf—became famous at the beginning of the XVIIth century, under the reign of the enterprising Charles V. "Antwerp was then truly a leading city in almost all things, but in commerce it headed all the cities of the world," says an old chronicler. Bruges, the great banking centre, yielded her position, and the Hanseatic merchants removed to the banks of the Scheldt. "I was astonished and wondered much when I beheld Antwerp," wrote an envoy of the Italian Republic, "for I saw Venice outdone." In what direction Venice was outdone is not recorded. Not in her architecture at least; scarcely in her painting. We cannot concede a Tintoret to a Rubens. Yet, inasmuch as Antwerp was the home of Metsys, of Rubens, Van Dyck, and the Teniers, the home also of Christopher Plantin, the great printer, her glory is not to be sought in trade alone. She is still remembered as a mother of art and of letters, while her mercantile pre-eminence belongs to a buried past. Important and interesting as the history of the city is, we cannot touch on it further. We must leave our readers to follow her fortunes, political and religious, under Mr. Robinson's able guidance.

Hampshire. By J. CHARLES COX, LL.D., F.S.A. Illustrated by M. E. Purser. London: Methuen and Co. 1904.

This is one of "The Little Guides," convenient in form and well printed. Mr. E. H. New has contributed the illustrations to most of the books of this series. The simplicity of his style is well known, and it is one that is eminently suitable for conveying information without prejudice to his charm as a draughtsman; far preferable, in our opinion, to a manner of illustration that is much in vogue, where the topographical interest has to be sought for amid a riot of clouds. Miss Purser, who is responsible for the drawings in this book, is a follower in Mr. New's school. The guide is conveniently arranged alphabetically and not in routes. The antiquarian interests of the county have been treated by the author with both knowledge and appreciation.

Near Oxford. By REV. H. T. INMAN, M.A. Oxford: Alden and Co., Ltd. London: Simpkin, Marshall, and Co. 1904.

THIS small book is a good example of the kind of guide which has of recent years been the outcome of increased interest in places lying off the beaten track, formerly but little known except to the enthusiast, but now more readily reached by bicycle and motor. The letterpress is the result of the author's own personal visits and notes, and the majority of the illustrations are from photographs specially taken for the work. Some of the best are those illustrating the churches at Ewelme, Cassington, Eynsham, Thame, and Burford. The district included has a radius of about fifteen miles from Oxford, an extremely rich one in examples of both church and domestic work. It will be found a good guide both for the amateur (for whom a glossary of terms is provided) and the architect and student desirous of learning the chief points of interest to be found in each village. An index is given, and also a clear map of the district at the end of the book.

Adventures among Pictures. By C. LEWIS HIND. London: Adam and Charles Black; 1904.

We do not see where the "adventures" mentioned in the title come in; the book is a volume of collected papers of criticism on pictures and painters, mostly reprinted from the *Academy*. The author writes pleasantly and sympathetically about painting, in an easy-going manner, and those who are interested in the art will enjoy turning over his pages, though they will hardly find any important questions of art-criticism settled in them. There is a little too much of the tendency of the modern English art-critic never to allude to the Royal Academy

without a sneer. In Goldsmith's time the secret of acceptance as an art-critic was "to praise the works of Pietro Perugino"; nowadays it is to sneer at the Royal Academy. It is true that the Academy bangs a great deal of uninteresting work, and that it is somewhat narrow in its sympathies; but it is not the less true that from every annual Academy exhibition could be picked out a sufficient number of good pictures to make up a better collection than any other that is habitually to be seen in London.

The Country Gentleman's Estate Book, 1904. Edited and compiled by W. BROOMHALL. London: The Country Gentleman's Association (1903), Limited. 1904.

This book has a great quantity of varied information connected with landed estates. The part which will be most useful to our readers is that entitled Building Memoranda. In a short space this contains a number of facts which the land agent, when he has to turn his attention to building, will find useful.

Timber: Growth and Structure; Felling, Converting, and Buying, etc. Edited by PAUL N. HASLUCK. London: Cassell and Co. 1904.

This little book of ninety-six pages contains, according to the preface, "a comprehensive digest of the knowledge of timber scattered over seventeen volumes of *Building World*." The compilation is well done, and the book includes a large amount of useful and interesting matter, but it is questionable whether the editor was wise in confining himself to the matter which had already appeared in his periodical. In the chapter on "Measuring Timber" nothing is said as to the allowances made for bark in round timber, or as to the special methods adopted in the sale of certain woods, such as teak. The chapter entitled "Varieties of Builders' Woods" contains short but useful descriptions of the principal timbers used in building, but can scarcely be regarded as comprehensive, as no mention is made of jarrah, karri, maple, cedar, sequoia, and some other varieties which are now on the market. In the paragraph on page 66 the effect of knots in timber under tension and compression is not by any means clearly stated. These, however, are matters of minor importance. The book contains fifty-six illustrations, and can be recommended as a convenient and useful handbook, especially for students.

Subject List of Works on Electricity, Magnetism, and Electro-Technics in the Library of the Patent Office. Published at the Patent Office, London. 1904.

We have received for review the "Subject List of Works on Electricity, Magnetism, and Electro-Technics, in the Library of the Patent Office." We can congratulate the compilers on the very careful manner in which they have done their work. Under the various headings the works are arranged in chronological order, and this arrangement is of great value to the historian as well as the inventor. The headings have been judiciously chosen, and the key given at the end we have found convenient. There are one or two minor headings which might be improved. On p. 18 we should have written "Darsonvalisation" instead of "Arsonvalisation," and on p. 206 we should have written "perpetual motion" instead of "perpetual motors." We notice, on p. 33, that the spelling of the author's name in a recently-translated German work has, very properly, been corrected. We have only noticed two misprints, namely, one on p. 69, where Mr. A. W. Heavyside's name is spelt "Heavyside," and the other on p. 112, where his brother's name is also wrongly spelt. On p. 167 we would have included Dr. Larmor's and Professor Rutherford's books under "Ions and Electrons."

Railway Maximum Rates, Charges, and Traffic Acts. By M. B. COTSWORTH. London: Bennrose and Sons. 1904.

With profits steadily falling off and tending towards the vanishing point, the manufacturing and trading public naturally search diligently for openings for retrenchment. Wages and cost of raw material affording no relief whatever, "expenses" are overhauled. Of these "railway charges" often forms one of the least satisfactory features, from a feeling of helplessness as to whether the charges are legal or not. It has seemed in the past almost impossible to get to the bottom of the railway companies'

powers in this respect; but, armed with Mr. Cotsworth's little volume, the mystery becomes wonderfully simplified. The inquirer can very soon ascertain the charging limit of every company for any distance and for any description of traffic—always remembering that the item of "cartage" is an uncertain quantity not dealt with by the Railway Rates Acts.

A feature of this work is the free use of heavy type and italics for the accentuation of important passages, while the scales of rates are most exhaustive and comprehensive. Possessors of the earlier editions will have already appreciated all this, and they will find much additional information of value in this third edition. As an example of the thoroughness which characterises the work we may instance the new sections dealing with light railways. The authorised charges will be found (set out with the same careful exactness as the scales of charges for the main lines) applicable to all light railways which have secured Parliamentary powers. Many of these are not yet in existence, and some in all probability never will exist, but the author has apparently missed no undertaking authorised up to date.

Oil Engines: Their Selection, Erection, and Correction. By W. A. TOOKER. London: Merritt and Hatcher, Ltd. 1904. (Is. net.)

This is a companion work to the handbook on "Gas Engines," reviewed in our columns last October. After an introductory chapter in which the author enters into a general explanation of the capabilities of oil engines and the manner in which they operate, successive sections of the book are devoted to "Selection," "Erection," and "Correction." These three chapters give much useful and reliable information which should be appreciated by intending purchasers, as well as owners, and attendants of oil engines. An appendix containing illustrations of some twenty well known types of oil engines is a very serviceable addition to the book, affording means of ready comparison between the various forms of such motors made in the present day.

Notes on Blacksmiths' Work. By MAJOR R. F. SORSBIE, R.E. Chatham: Royal Engineers Institute. (Agents: W. and J. Mackay and Co., Ltd., Chatham.) 1903.

This pamphlet consists of a very businesslike collection of notes compiled for the instruction of officers and men of the Royal Engineers, whose duties frequently require them to superintend the work of blacksmiths, and sometimes to establish workshops and to teach unskilled men the essentials of modern practice. Detailed comment on a work of this character can scarcely be expected, but we may say generally that the subject matter is well selected, and that the individual notes are clearly and concisely stated. The book is divided into eleven chapters, dealing with such matters as the construction and equipment of the smithy; forging, welding, and otherwise treating wrought iron and steel; hardening and tempering steel; bench work of various kinds; and coach smithing. The letterpress is elucidated by a series of forty-one plates, containing no less than 230 figures, illustrating smiths' tools of various kinds and the manner in which they are to be applied. Although specially written for the Service, we confidently recommend this book to all who desire to obtain trustworthy information as to the work conducted in the smithy.

The Law and Practice Relating to Private Street Works, together with an Appendix, containing Particulars and Decisions of Cases. Reported by WILLIAM SPINKS, M.L.C.E. London: E. and F. N. Spon, Ltd. 1904.

This is rather a mixed kind of book. The first part contains portions of statutes, the second remarks on the law, and lastly there is an appendix giving a *précis* of different decisions. This is well done; but, on the other hand, the value of judicial decisions is often much lessened to the reader when the judgment cannot be read in full. The absence of an index is rather a serious drawback to the work.

Saw Mill Work and Practice: A Book for Owners, Overseers, and Operators of Wood-Working Machinery. By W. J. BLACKMUR. London: William Rider and Son, Ltd. 1904.

In this book the author deals with wood-working machinery from the standpoint of the actual user. It is no part of his programme to discuss the design and mechanical construction

of such appliances, and the whole of the matter and illustrations relate to the everyday work of the saw mill. Although the greater part of the book is devoted to the care and operation of saws and sawing machines of various kinds, there are three or four chapters which deal with rotary cutter and fixed-knife planing machines, and with machines for special objects. So far as these subjects are concerned, the author is evidently writing on matters with which he has the familiarity begotten of long personal experience. The same cannot be said of the chapters on "Shafting and Belting," and "Motive Power." Many hints contained in the last mentioned chapters are both useful and practical, but it is manifest that the author possesses a very limited qualification to offer advice on the subjects in question, and especially on that of motive power. Considering the book as a whole, we must say that it is well worth the careful study of those who desire reliable guidance on the ordinary routine of the saw mill. It is to be regretted, however, that the work of the printer and binder has not been better performed.

Illustrations.

JUMIÈGES.



THE illustration of Jumièges Abbey shows the XIII century nave, as seen from the southwest. On the right is seen the western wall of the central tower now disappeared. Weatherings of three different roofs are seen on this wall. The XIII century roof of the nave rested on gabled transverse arches. These gables would naturally be built as flat as possible to diminish the weight on the arches. It may be inferred, therefore, that the lowest of the three weatherings represent the pitch of the XIII century roof. At some period a balustrade was constructed in front of the triforium arcade; marks of the balustrade still remain. A similar balustrade, also not of the original construction, remains in the triforium of the nave of the Abbaye-aux-hommes at Caen. The capitals, as is usual in the XIII century work of Normandy, are of Corinthian type, with the acanthus omitted; the cushion capital is rare in Normandy till the XIII century. Illustrations of Jumièges towers and nave appeared in our issues of July 16 and August 6. Longitudinal and transverse sections of the nave are given in Ruprich-Robert "L'Architecture Normande," Vol. I, Plates 12 and 13.

SOME BRETON CHAPELS.

THESE illustrations are in connexion with an article appearing on another page, in which the buildings illustrated are referred to; with the exception of the gallery at Locqueffret, which is given as a typical example of Breton woodwork. It is probably taken from a demolished roof-loft, and is brightly coloured. The church also contains some very rich Renaissance altar-pieces.

The illustrations on Plate I. are from photographs by M. Villard, of Quimper; those on Plate II. from photographs by Mr. F. C. Eden.

HOUSE AT CROYDON.

THE lower portion of this house—erected about three years ago—is built of red bricks with a white flush joint. Stocks were employed in the upper portion, covered with rough cast mixed with a proportion of coppers before being rendered, sufficient to impart a bismit tint. The woodwork was brought out to the general face of the work. The roofs are covered with thick rough-edged green slates.

Parts of the interior were panelled in soft wood of simple design, and painted mostly a stone colour. The architect was Mr. W. F. Harber.

EXMOUTH COTTAGE HOSPITAL.

THIS building has been recently completed at a cost of 4,000.

The general contractor was Mr. Albert Hayman, of Exmouth. The sanitary work was executed by Messrs. Hubber and Son, of Exeter, and the heating by Messrs. Whippell and Row, of Exeter.

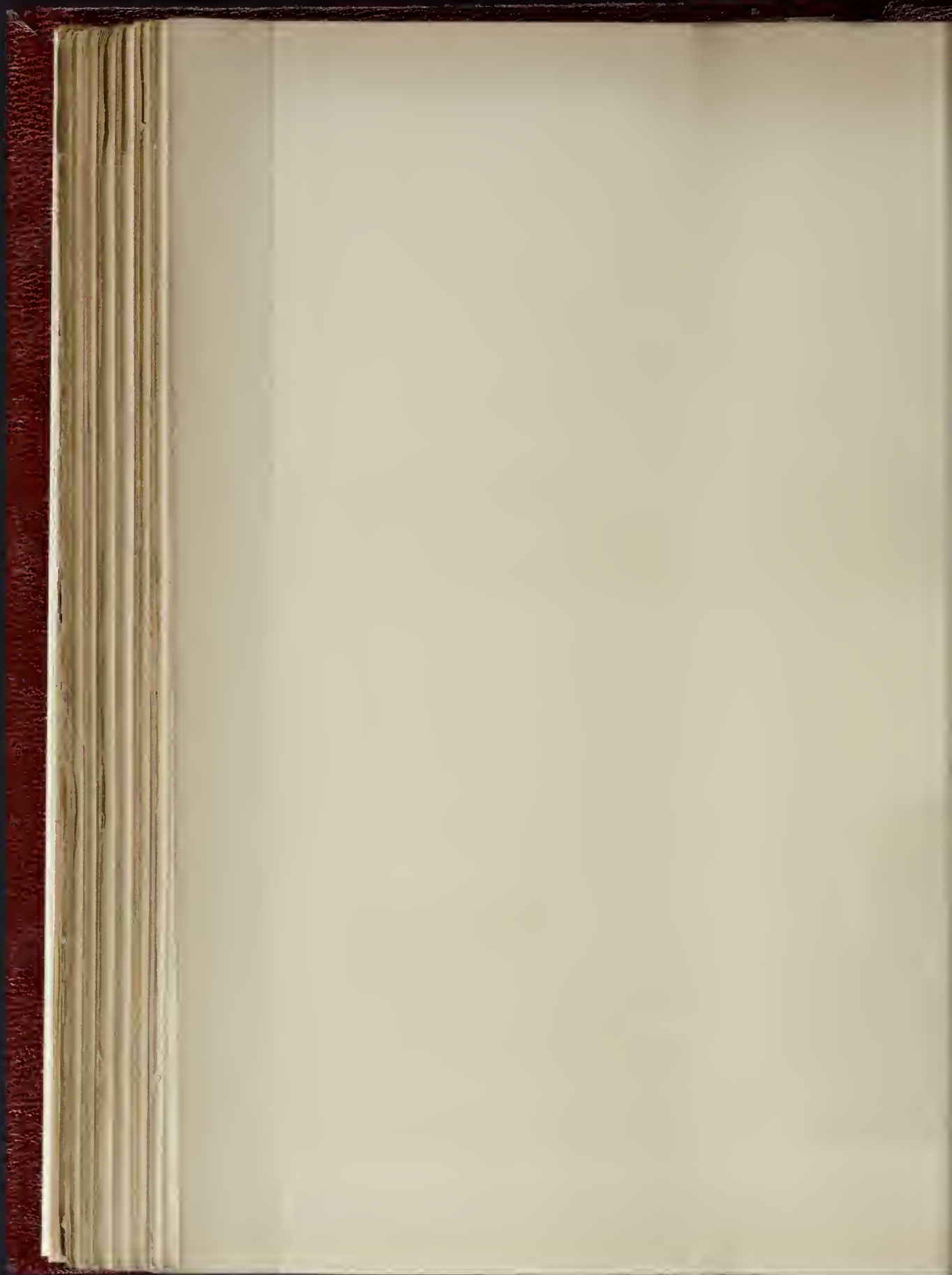
The ground plan is given. Upon the first floor are placed the kitchen and offices, and bedrooms for the staff.

Lifts communicate between the kitchen, ward, scullery, and cellars.

The architects were Messrs. Tait and Harvey.



JUMIÈGES NAVE, FROM WEST END.





SAINT-PIACRE.



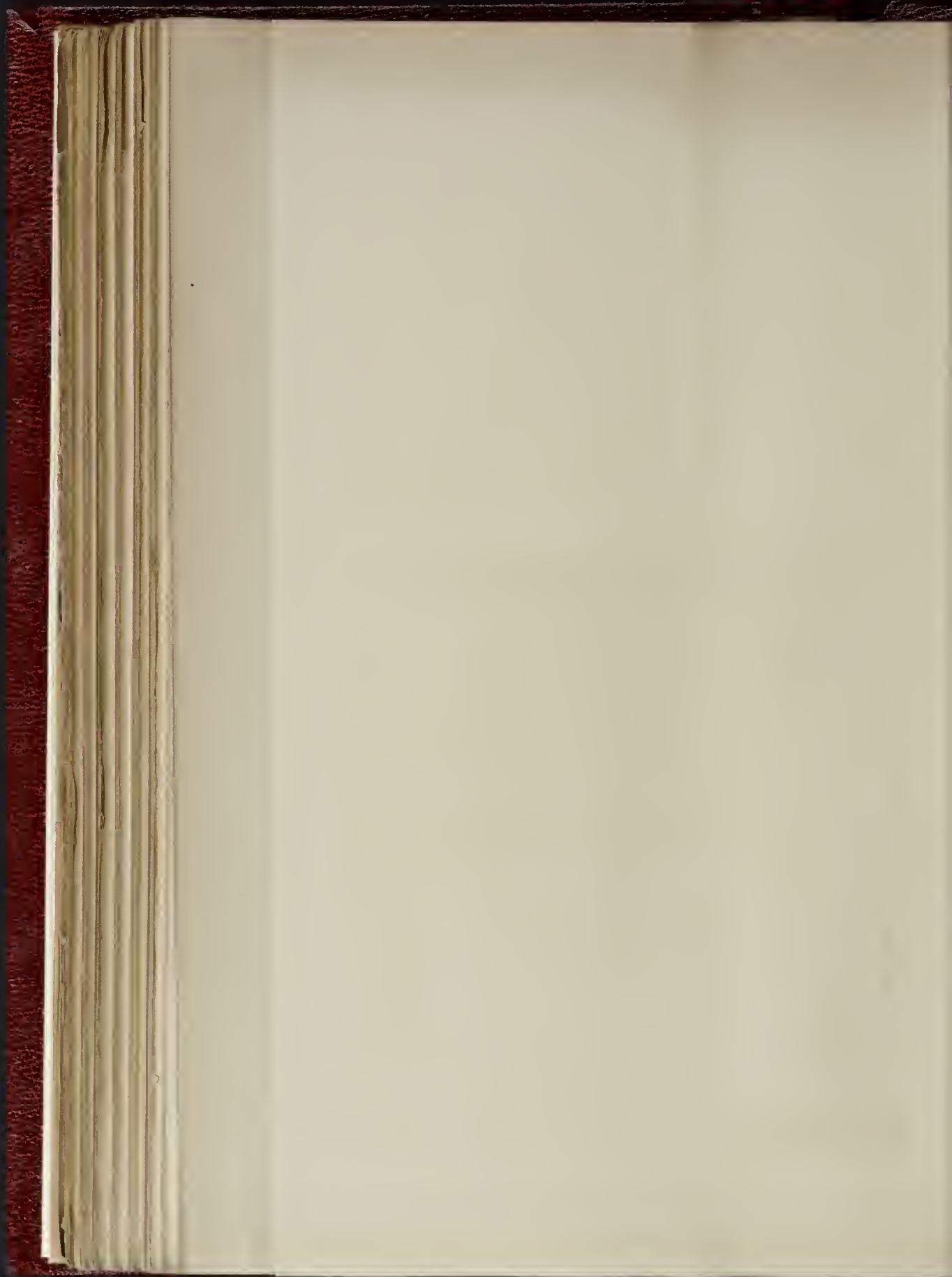
CHURCH AND CALVARY OF TRONOAN.



ST. BARBE.



PENMARCK: NOTRE-DAME-DE-LA-JOIE.





CHANCEL, ST. FIACRE.



SCREEN, ST. NICOLAS.



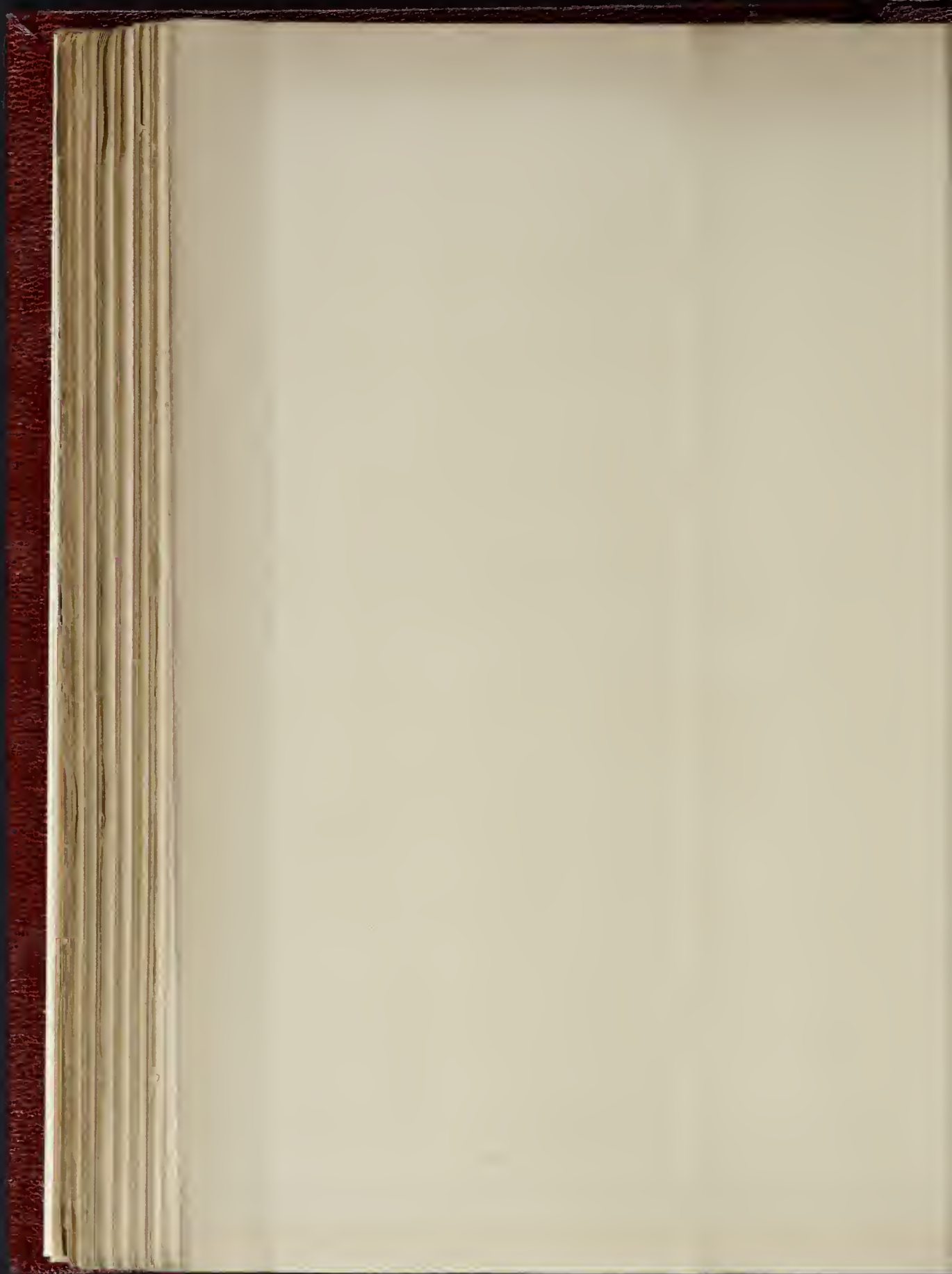
ST. FIACRE: STATUE OF PATRON.

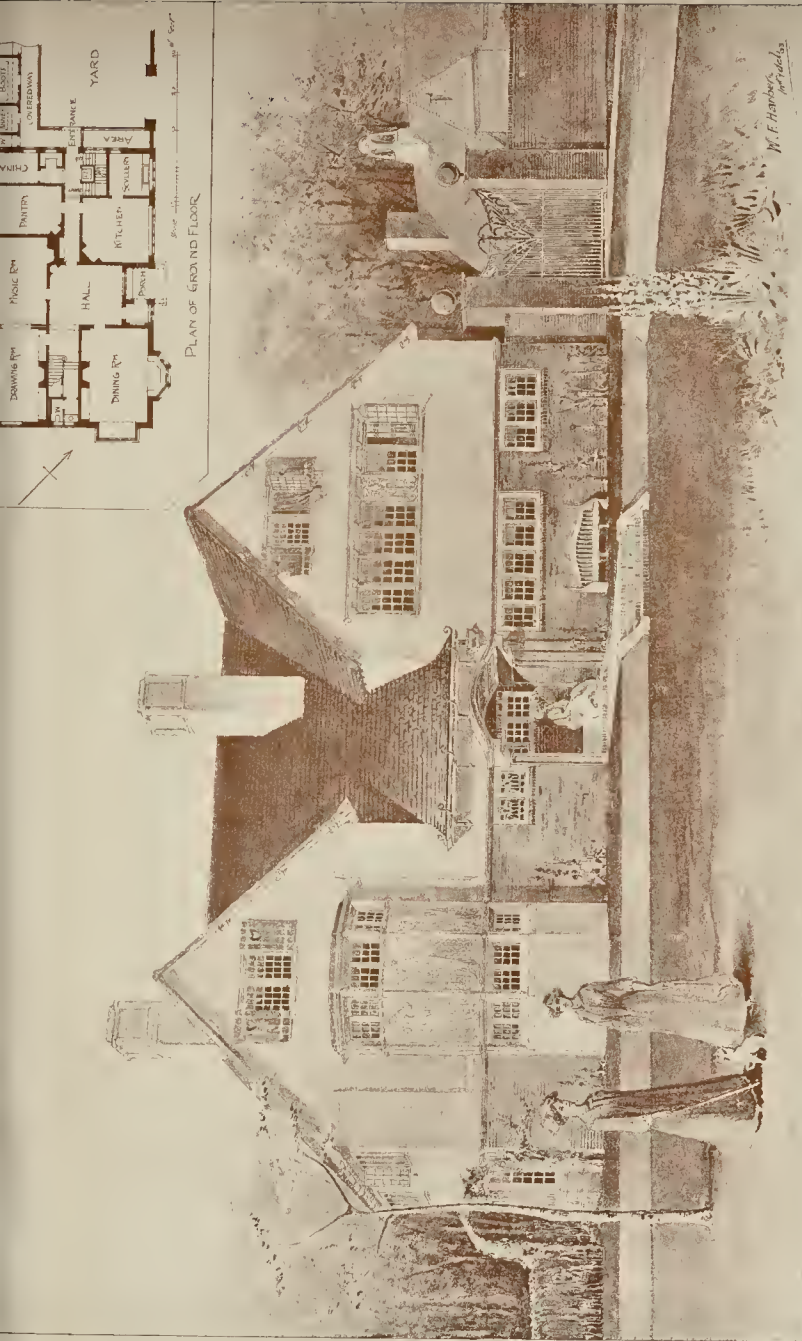


SCREEN, ST. NICOLAS.



LOCQUEFFRET.

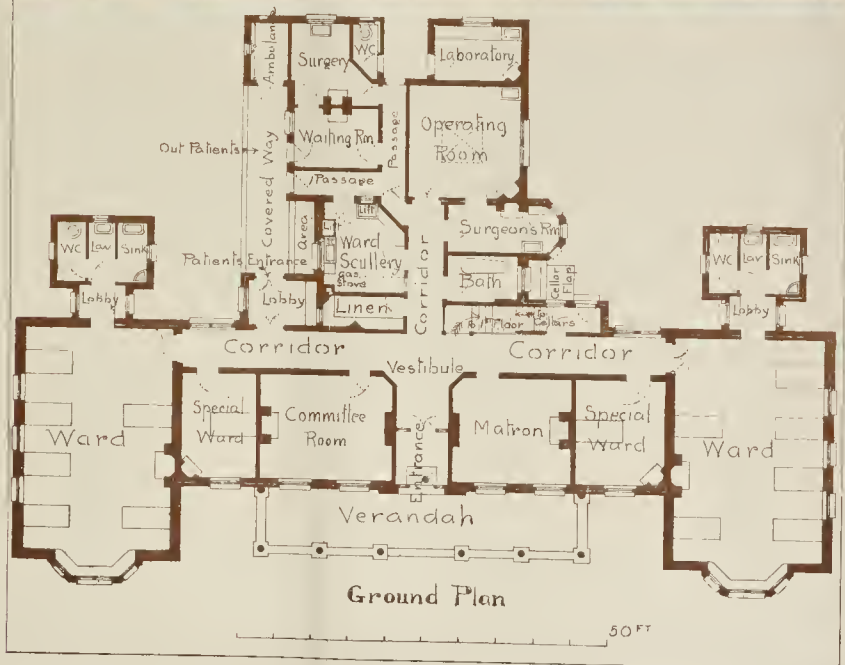




HOUSE AT CROYDON—MR. W. E. HARPER, ARCHITECT

1/4" PHOTO SPRAGUE & CO. Lth 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

THE BUILDER, AUGUST 13, 1904.



1/4" PHOTO SPRAGUE & CO. Lth 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

EXMOUTH COTTAGE HOSPITAL.—MESSRS TAIT & HARVEY, ARCHITECTS

TRADE CATALOGUES.

WE have received from the General Electric Company, of Queen Victoria-street, their Progress Sheet for July. They have also sent us a catalogue of their desk, bracket, and ceiling fans. In the progress sheet a novel and compact switch and cut-out board is shown, which is well adapted for its purpose. The prices of the various sizes of the "Union" system of screwed braided conduit are also given. A much better finish can be given to braided conduits than to welded conduits, since less heating is required for brazing than for welding. Standard gas threads are used, so an ordinary plumber ought to have no difficulty in fixing this conduit. The protected wall plug shown is ingeniously designed, and is worthy of special mention. In the fan catalogue a great variety are shown, which can be driven either by direct or alternating current motors.

OBITUARY.

MR. J. S. STEWART.—We regret to record the death, on the 5th inst., of Mr. J. S. Stewart, of the firm of Messrs. Lancaster, Stewart, and Rickards. Deceased had a distinguished career as a student, receiving both the gold and silver medals of the Royal Academy, and, amongst other distinctions, was placed second in the Soane competition of the Institute of Architects. He was associated with Messrs. Lancaster and Rickards in winning the competition for the new town hall and law courts at Cardiff, and other works, such as the new Deptford town hall, the new art school at Hull, and Godalming town hall, and in the preparation of many other designs submitted in public competition by the firm. Before joining the firm he had, in collaboration with Mr. W. Grace, won the competition for a new Kursaal at Weston-super-Mare, which has since been completed from their designs. Two years ago he developed an aneurism of the heart, which recently forced him to retire from participation in the business of the firm, unfortunately before the chief works in which he was associated were completed. His age was thirty-eight years. He left a widow, but no family.

GENERAL BUILDING NEWS.

LATIMER MEMORIAL CHURCH, BIRMINGHAM.—The Bishop Latimer Memorial Church, Handsworth New-road, Birmingham, was consecrated by the Bishop of Worcester recently. The new building, which has been erected on a piece of land measuring 10,500 sq. yds. near Soho Station, takes the place of a mission-room. The church has been designed by Mr. W. H. Bidlake, of Birmingham, and the contract has been carried out by Messrs. William Sapcote and Sons, of Birmingham. The design is in the late decorated style, and is carried out mainly in Staffordshire brick, with Greenhill stone dressings. The interior is lined with buff brick, and the roof of the nave is supported by a stone arcade. A feature externally is the square tower, 100 ft. high. The belfry will eventually contain eight bells. The nave is lofty, with an open-timbered roof. The chancel is almost as high, and has a gabled stone roof. There are a morning chapel, vestry, and a baptistry, containing a marble tank for total immersion, as well as a font. The church is 149 ft. long and 53½ ft. wide within the walls, and has seating accommodation for 1,000 persons.

CHURCH EXTENSION, SHEFFIELD.—The foundation-stone was laid recently of the extended nave of St. Cuthbert's Church, Sheffield. At present the church accommodates about 300 people, and the completion of the nave will give accommodation to 400 more. Local stone and Derbyshire sandstone form the material for the outside of the building; the interior stonework consists of Bath stone. The architects are Messrs. J. D. Webster and J. Douglas Webster, of Sheffield; and Messrs. George Longden and Son, of Sheffield, are the contractors.

WALTHAM ABBEY CHURCH.—A fund has been opened for carrying out a restoration, under the directions and superintendence of Mr. J. A. Reeve of the parapet of the tower, by reinstating the battlements and the angle-turrets in accordance, as far as modern conditions will permit, with the original design of the middle of the XVIIth century. The proposals extend to the replacement of the present one-light window with a two-light window in each face of the bell-chamber.

REOPENING OF DURNFORD CHURCH, WILTSHIRE.—The ancient parish church of Durnford has lately been restored, under the supervision of Mr. C. E. Ponting, the Diocesan surveyor. During the progress of the work some very interesting discoveries were made, not the least of these being several frescoes

over the chancel arch, while a figure of St. Christopher was found on the south wall. Another interesting discovery was part of a window against a Norman buttress which proves the antiquity of the church. The pulpit, reading desk, lectern, and altar rails, all date back to the early part of the XVIIth century. The old gallery, which was found to be very dilapidated, has been removed, and a smaller one raised in its stead. The ceiling of the latter is of very fine oak, and the whole is supported by two Corinthian pillars. The altar has been redecorated. The pews have been repaired. Although a considerable sum was expended in the restoration of the interior, a large part of the money has gone in underpinning. The exterior has also been thoroughly overhauled, and the roof and walls have been renovated. The north and south porches, which date back to the XVIIth century, have also had their woodwork repaired. The greater part of the ivy—the trunk of which is as large as a man's body, and which has embedded itself 10 in. into the tower, and consequently displaced several large stones and buttresses—has been removed. The dilapidated belfry has been restored.—*Wiltshire County Mirror.*

CONGREGATIONAL CHURCH, EPSOM.—The foundation-stones of the new Congregational church at Epsom were laid recently. Accommodation will be provided for 500 persons, and the cost will be about 4,000. Messrs. Gregg and Stakley, of London, whose plans were accepted in a limited competition, are the architects for the work.

ST. NICHOLAS CHAPEL, CALISBROOKE CASTLE.—Mr. Percy Stone, F.S.A., is engaged upon the restoration of St. Nicholas Chapel as a national memorial to King Charles I. The chief exterior features of the new works comprise the building of a porch at the west end of the north wall, and of a restoration of the early XIIIth century doorway. The seating, for fifty persons, and the dado of the inner walls is made of oak from the hull of the *H.M. ship Arctik*. The roof will be panelled with oak decoratively painted, the floor of the body of the church is to be of terrazzo mosaic, and that of the sacarium will be inlaid in marble. The King has presented the organ from the Chapel Royal, Savoy, with the carved oak table and altar furniture from the late Queen's private chapel in Osborne House. It is intended, should the funds permit, to insert in the west wall a bronze medallion portrait of Charles I., modelled after the profiles by Van Dyck, and to decorate the panels of the east window with the armorial bearings of lords and governors of the Isle of Wight. The chapel was rebuilt in 1738 on the site of an ancient structure which stood there at the time of the conqueror's survey, and was an appendage of Quarr Abbey, in Binstead parish.

SCHOOLS, FULNECK, YORKSHIRE.—A new school has been erected at Fulneck. The new buildings have been provided at a cost of about 4,000. The building, formerly known as the Sisters' House, has been taken over for school purposes, and a new modern wing erected, containing classrooms, a lecture hall, measuring 53 ft. by 25 ft., and rooms for residential purposes. The lecture hall on the top floor is so arranged as to be available for use as a gymnasium for the young ladies. In addition to three large classrooms, six smaller rooms are obtained in the east wing, and there are a dormitory and smaller bedrooms provided in the old block, where also are located the kitchen and the governors' apartments. The corridors and classrooms are heated by hot-water pipes and radiators, and attached to the bedrooms is a range of lavatories and hot and cold water baths, etc. There are also a wash-house and laundry. A hockey and tennis ground is in course of preparation. The contracts have been carried out as follows:—Masonry, Mr. Wm. Hutton, Fulneck; joinery, Mr. W. Procter, Pudsey; plumbing, Messrs. J. Scarth, Pudsey; plastering, Messrs. A. and L. Wheeler, Calverley; slating, Messrs. Hill and Nelson, Bradford; and painting, Messrs. Armitage and Driver, Pudsey. The work has been in progress eighteen months, and has been carried out from the drawings and under the superintendence of Mr. C. S. Nelson, architect, Fulneck and Leeds.

WESLEYAN SCHOOL, CHADDERTON, OLDHAM.—The foundation-stones were recently laid of a new Wesleyan school at Chadderton. The principal contractor is Mr. Emanuel Whitaker, and the sub-contractors are Mr. Whitaker, bricklayer and excavator; Messrs. S. and J. Witches, masons; Messrs. Enoch Shaw and Son, plumbers; Mr. Kelly, plasterer; and Mr. Pogson, slater. Mr. Thomas Hilton, architect, Oldham, prepared the plans for the work.

NEW SCHOOL, ALNWICK.—The new Duke's School, at Alnwick, was opened on the 27th ult. The style of the structure is Tudor. The west wing of the quadrangle is formed by

the sub-warden's house, and hostel for ten resident masters; while on the east side is the main building, providing for English and classical instruction on the ground floor. A library, reading-room, and office are also provided, the classrooms for the lower senior boys being on the left. The upper senior classrooms, also the large examination hall, are on the right. The hall is about 50 ft. by 27 ft. There is a gallery over the corridor, and it is so arranged that two classroom doors open into it by a folding partition, giving accommodation in the total, for about 800 persons. The first floor also contains special classrooms, and rooms for science and art subjects, including art classrooms, physical laboratory, lecture theatre, masters' preparation and chemical laboratory. The architect for the work was Mr. J. Wightman Douglas, of Newcastle, and the cost, inclusive of site, was 15,000.

INFECTIOUS HOSPITAL, ROTHERHAM.—The foundation-stone of the new infectious hospital for the County Borough of Rotherham was laid on the 29th ult. The site is on the north-west side of Badsley Moor-lane, a little over a mile from the parish church. The area of site available for hospital purposes is 9½ acres, and the portion present to be enclosed about 5½ acres. The hospital buildings are arranged on the pavilion plan, and have frontages to the south-east. There are five ward blocks, each with equal accommodation for males and females—viz., acute scarlet fever, eighteen beds; mild scarlet fever, sixteen beds; typhoid, fourteen beds; diphtheria, fourteen beds; observation block, four beds; total, sixty-six beds. Included in this accommodation are six private wards, one bed each. Attached to each block are the nurses' room, bathroom, stores and linen places, water-closets, and slop sinks. The floors will be of pitch-pine, polished. All internal angles to floors, walls, and ceilings will be curved. Verandahs will be placed at the front of each ward block. An administrative block will be placed at the front, to Badsley Moor-lane, and provide accommodation on the ground floor for the medical officer, matron's rooms, nurses' sitting and dining rooms, corridors, lavatories, etc., cooking kitchen, scullery, larder, stores, etc., with side entrance for nurses and serving the wards, etc. On the first floor fifteen bed-rooms will be provided for matron and nurses, each fitted with lavatory, bathroom, etc., and box-rooms are provided on this floor. The different rooms in this block will be heated by open fireplaces, the corridors, staircases, etc., by hot water apparatus. The laundry block comprises washhouse, mangling-room, sorting-room, etc. Adjoining the laundry is the disinfectant house, engine and van, houses, boiler-house, with duplicate Cornish boilers. Stables and ambulance house is also provided on the west side of the laundry. A discharge block and mortuary are also arranged on the east side. The lodge is to be erected near the entrance to the hospital. The different blocks will be built with local bricks and Marlcock stone dressings, relieved with white Lincolnshire brick bands, and graded string courses. It is proposed to adopt the electric light to all the blocks. The contract for the building (minus the mild scarlet fever block) has been let to William Thornton and Sons, of Rotherham, for the sum of 11,994.7, the work to be completed in fourteen months. The total cost of the whole scheme, including mild scarlet fever block, steam laundry fittings, electric light installation, and laying out of the grounds, will be about 20,000. Mr. J. Platts is the architect.

DISPENSARY, LIVERPOOL.—The foundation-stone of new buildings for the Liverpool Medical Missionary Society, to be erected on the site of the old dispensary, in Burlington-street, was laid on the 25th ult. The new premises, designed by Messrs. R. Owen and Son, are to consist of a waiting-hall to hold 350 persons, and named the "Hakes Memorial Hall" in honour of the late Dr. James Hakes, and adjacent, an administration department, three stories in height. The hall, entered from Bevington-hill, is to be 45 ft. by 40 ft. Adjoining is a nurses' room, with surgeries on each side, a dispensary, and in the basement a smaller waiting-room for 150 persons. A doctors' room, with entrance from Burlington-street, a keeper's dwelling, and other apartments are provided. On the outside, the building will be of red brick, with terra-cotta dressings.

MARKET EXTENSION, BRADFORD.—The extension to the market, in Rawson-square, Bradford, is now nearing completion. When finished, the building will consist of market hall in the centre, surrounding which there will be ten shops, with frontages to Rawson-square, Northgate, and James-street, and a hotel. The exterior is built of stone, and is in the Italian Renaissance style. At either end of the Northgate elevation there is a domed tower, 34 ft. in height from the street level to the top of the finials, and a third dome, in

shape hexagonal, and 60 ft. high, rises above the main entrance. The area of the market-hall, which will be covered with a single-span roof of glass and iron, is 6,684 sq. ft., and the floor area of the shops and the hotel is 51,400 sq. ft. The shops and the hotel market-hall will be used for cold storage purposes. Entrances are provided on each of the three frontages, and there is a wagon entrance from James-street, and also a covered way communicating with the present meat and fish market. The tenders accepted amount to 24,537l., and certain additional work, not provided for in the original contracts, has cost 1,132l., making the total cost of the land and building 50,669l. The following are the contractors:—Masons' work, Messrs. Thomas, Obank and Sons, Idk.; Joiners' work, Messrs. E. Fearnley and Sons, Bradford; ironfounders' work, Messrs. Taylor and Parsons, Bradford; plumbers' work, Mr. Albert Ross, Shipley; painters' work, Mr. Arthur Wear, Bradford; plasterers' work, Messrs. Crabtree and Berry, Bradford; slaters' work, Messrs. W. H. and E. Walton, Bingley; roof glazing, Messrs. Helliwell and Co., Brighouse; Messrs. T. C. Hope and Son, whose plans were selected in competition, are the architects of the work.

REBUILDING IN HOLBORN.—The enlargement of the premises of A. W. Gamage, Ltd., outfitters, on the north side of the street, will be carried out after the plans and designs of Mr. Joseph Sawyer, the architect of that company's premises in Holborn and Leather-lane. The new buildings, to be constructed of Portland stone and ironwork, with those recently erected, will cover a total area of 11,050 ft. super., and will have a frontage of 95 ft. to Holborn. They will occupy the site of Nos. 113-122, Holborn, the old Black Bull coaching-house and tavern, and Bull Inn-chambers at the rear, which were built in the former yard of the inn. The ground has been leased by the freeholders, the Prudential Assurance Company, for a term of ninety-nine years, by an indenture of April 28 last, at a ground rent of 3,220l. per annum, the lessees covenanting to erect an improved block of buildings at a cost of not less than 50,000l. The basement and upper portion of the block is to be planned for purposes of a restaurant and show-rooms and offices respectively for other tenants; the ground floor will be appropriated to the company's shops and sale-rooms.

NEW BUILDINGS, KENSINGTON.—A block of land in High-street, Kensington, on the north side, with frontages to three streets, and an area of about half an acre, has been built upon by Messrs. John Barker and Co., according to the designs of the architect, Mr. Philip E. Pidditch. The buildings are in Portland stone and red brick, and consist of Messrs. Barker's business block on the ground and first floors, and five floors of flats over, approached by one central staircase, and with three subsidiary ones.

INSITUITE BUILDING, HOYLAKÉ, LIVERPOOL.—The foundation-stone of the Hoylake Institute, at which the Hoylake Gospel Temperance Society are to take up their headquarters, was laid a short time ago. The buildings will extend over an area of about 2,500 sq. yds., at the junction of the Birkenhead and Hoylake roads, and will comprise an assembly hall to accommodate a number of 350 persons, a crush-room, and suite of apartments to be used as a club. Externally the building will be faced with Ruabon wire-cut bricks, with Grinshill stone dressings. The architect is Mr. W. M. Law, of Liverpool.

AVR NEW GAIEY THEATRE.—The New Gaiey Theatre, Avr, which was partially burned on August 4, 1903, has been reconstructed in accordance with plans prepared by Mr. Alex. Cullen, architect, Hamilton. The building has been heightened 11 ft., and eight boxes now take the place of the original four. An amphitheatre has been introduced, the entrances and exits have been improved, so that there are two exits from each section of the house. The entire auditorium has been remodelled, and the galleries taken down and re-erected with steel and concrete. The roof has also been renewed, and is entirely of steel beams and concrete. The stage has also been improved.

Bristol Channel Yacht Club.—The Earl of Jersey opened recently the new club premises of the Bristol Channel Yacht Club at Mumbles. In May last the committee instructed their architect, Mr. Glendinning Moxham, Swansea, to prepare the necessary design for the work, and shortly after the contract was let to Messrs. Bennett Brothers.

FIRE STATION, BALLYMACRETT, BELFAST.—The new branch fire station, erected in Ballymacrett, by the Council of the County Borough of Belfast was opened on the 29th ult. The new station is Georgian in style. The outer elevations are in red brick, relieved with white Scotch sandstone dressings. The interior walls throughout are of bricks, plastered with cement dado. The engine-house

and stables are in enamelled bricks, the engine-house, duty-room, and recreation-room having varnished pitch-pine ceilings. The roofs are covered with Welsh Countess slates. The engine-house will accommodate three machines and is placed towards the principal front. It is 35 ft. long, 33 ft. wide, and 6 ft. high, and immediately behind the engine-house are the stables. Accommodation is provided in the stable to stand four horses immediately behind the engines, with loose-boxes for two horses at the back of the stable. Alongside the engine-room is placed the duty-room and recreation-room. At the back of the building is a yard, 62 ft. long and 34 ft. wide, with entrances at each end. A range of buildings is placed round two sides of the yard, consisting of lavatory, fodder store, washing-shed, and coal stores. A laundry and store are provided on the ground floor next the dwelling-houses. The dwellings for the staff are at the front and side of the site, those at the principal front being over the engine-house, watch-room, and recreation-room, and those at the side being on the ground floor and first floors, one house over the other. All are self-contained, and the entrances to all are from the yard and the balcony. The lighting throughout is by electricity. The engine-house and stables are paved throughout with adamantine elinkers, and the yard with square sets. The contractors for the building were as follow:—Mr. William Dowling, builder; Mr. John Dowling, plumber and electrician; Mr. Stanley Johnston, electric bells; Messrs. Mustgrave and Co., Ltd., stable fittings; Mr. Thomas Try, automatic door fittings; Messrs. Young and Mackenzie, architects.

WALDORF THEATRE, ALDWYCH.—It is expected that the new theatre will be ready for occupation in the course of the spring of next year. The building is being erected after Mr. W. G. R. Sprague's plans and designs, and a lease of the property has been taken by it. It is said, Messrs. Schubert Brothers, performers by American companies of musical comedies.

A NEW OPERA HOUSE, LONDON.—A project has been opened for the erection of an opera house in Aldwych, on the land between the churches of St. Mary-le-Strand and St. Clement Danes. It is stated that the Duke of Bedford intends to demolish the opera house in Covent Garden shortly, in order to carry out a contemplated extension and improvement of Covent Garden market, on the north-east of the Piazza.

OPEN-AIR SEA-WATER BATHS, CARNARVON.—The Carnarvon Corporation have accepted the tender of Messrs. Geo. Roberts and Brothers, contractors, Ruabon Works, Llandudno, for the construction of a concrete open-air sea-water bath on the foreshore of the Menai Straits, from plans prepared by Mr. Edward Hall, the Borough Engineer, and approved by the Local Government Board, who have already sanctioned the borrowing of 2,500l. for its erection, the loan to be repaid in twenty years. The bath will be of elliptic form, and provided inshore with a caretaker's office and twenty dressing-boxes, all arranged with flat roofs for the accommodation of spectators. The impounded water will measure 250 ft. in length, 35 ft. in breadth, and range from about 3 ft. to 9 ft. in depth at highest states of tides.

OFFICES, COCKSPUR-STREET, LONDON.—The new offices, to be occupied by the Amalgamated Shipping Companies—namely, the White Star Line, American Line, etc., in Cockspur-street, will occupy the site of the building formerly Messrs. Hampton's offices. The architect is Mr. Henry Tanner, Junr., and the builders, Messrs. Waring-White Building Company, Ltd. The concrete floor and roof construction has been let to the Columbian Fireproofing Company, Ltd., King William-street, E.C.

HOTEL, PICCADILLY.—The new Great Ritz Hotel, Piccadilly, is being erected on the site of the old Walsingham Hotel. The architects are Messrs. Merys and Davis, Dean-street, Soho, and the builders, Messrs. Waring-White Building Company Ltd. The contract for the concrete floor and roof has been let to the Columbian Fireproofing Company, Ltd., King William-street, E.C.

STAINED GLASS AND DECORATION.

St. Winstan's Church, Repton.—A stained-glass window, consisting of three lights and tracery has just been unveiled in this church. The subject chosen is "Christ Blessing Little Children," which is contained in the whole three lights, while in the tracery openings above there are angels holding scrolls with texts beneath. Practically all the stonework is new, but the architect, Mr. Naylor, of Derby, has retained some of the old, and has introduced it in the tracery. The work was carried out by Messrs. Percy Bacon and Brothers, of Newman-street, London, W.

SANITARY AND ENGINEERING NEWS.

NEW BRIDGE, ILFORD.—The new bridge over the Roding at Ilford was opened a short time ago. The bridge is 60 ft. wide, and there is a clear span of 40 ft. On each side are abutments of red brick, with Aberdeen granite quoins, ornamented with pilasters, and with moulded caps. The bridge is constructed with steel girders and trussing, with cast-iron fascia and an ornamental parapet above in open ironwork, bearing an iron device with the county arms displayed. There is wood-block paving on the bridge and the paths are of non-slip Yorkshire paving, with granite kerb. Iron railings have been put up from each side of the bridge to where the paths join the houses and shops. The work has been carried out by Messrs. A. Fassy and Sons, contractors, of Leytonstone, at a cost of 12,619l. Mr. Neave was the engineer in charge of the work.

RESERVOIR, GIRVAN, N.B.—The new reservoir at Girvan was opened on the 21st ult. The works, which cover close on 5 acres of ground, have a storage capacity of 15,000,000 gallons of water. The cost of the reservoir will be 12,000l. Mr. Jno. Eaglesham, C.E., Avr, was the engineer; and the contractors, Messrs. Osburne, Avr.

WATERWORKS FOR BRADFORD, NIDD VALLEY.—The new Bradford waterworks, situated in the Nidd Valley, were opened recently. The works were commenced in September, 1893, by the construction of the masonry dam at Gouthwaite, and which forms a lake nearly 24 miles long. In the following year Haden Carr reservoir and the main conduit to Chelvey Heights, 35 miles in length, with the branch mains, were in operation. With the exception of the bridges carrying the aqueduct over the valleys, the intake dams on the streams which deliver the water into the conduit on the way to Bradford, and the valve, measuring and screening chambers, the works are underground. There are four tunnels on the line of the works, over 6 miles in length:—Rain Stang, 1½ miles long, 404 ft. deep; Burn and Ashfoldside Beck, 13 miles in length; Greenhow Hill, which divides the valleys of the Nidd and the Wharfe, ¾ miles long, 450 ft. deep. There are 12 miles of main aqueduct in cut and cover, 6 ft. 3 in. by 5 ft. 9 in. inside; 15 miles of steel and cast-iron pipes, 3 ft. diameter; and 6 miles of branch pipe feeders. The drainage area is 18,000 acres of clean moorland, which rises from 900 ft. to 2,000 ft. at Great Wharfedale. Mr. James Watson, M.Inst.C.E., was the engineer for the work, Mr. Barlow being the resident engineer. The total cost of the scheme will be about 2,000,000l. sterling.

MANCHESTER SHIP CANAL.—The following is the recently issued report of Mr. Hunter, the Chief Engineer to the Manchester Ship Canal Company, as to works:—"The depth of water in the Ship Canal and docks has been fully maintained throughout the entire length of the waterway by means of the dredging operations. The leading jetty at the inner end of Eastham locks has been completed and is in use. The spare steel gates for the upper end of the 80-ft. lock at Eastham have been completed and delivered. A timber wharf is being constructed on the southerly side of the canal at Runcorn, adjacent to the new transporter bridge between Widnes and Runcorn. The new berth and the railway sidings in connection therewith on the northerly side of the canal at Weaste for the accommodation of the coal traffic has been completed, and the coaling crane is now in course of erection thereat. Considerable extensions of the railway system at and about the docks at Manchester are in course of formation. The embankments and slopes of the canal are generally in good condition, and the works throughout have been efficiently maintained. The works in connexion with the new dock on the site of the old racecourse, and with the transit sheds on the southerly side thereof, which are being carried out by Mr. Henry Lovatt and others, under contract with the Manchester Dock and Warehouse Extension Company, Ltd., have made good progress during the half-year."

NEW BRIDGE, EXETER.—The foundation-stone of the new bridge, which is being built over the river at Exeter was laid recently. The bridge will consist primarily of eight pairs of steel girders, each pair meeting in mid-stream. The road is to be of jarrah wood blocks, in which will be laid electric tram lines. Under the slightly raised paths will be gas and water mains. The facing and corners are of granite, chiefly from Blackingsstone Quarries on Dartmoor. The cost will be over 25,000l. The design and construction of the works have been under the supervision of Mr. Cuthbert A. Brereton, engineer, Mr. Woodman being the contractor, and Mr. A. T. Easton sub-contractor for the stonework. The resident engineer is F. G. A. Pinckney, and the clerk of the work, Mr. G. A. Mason.

FOREIGN.

SWITZERLAND.—The hospital at Basel is to be enlarged according to the plans of the architects, La Roche, Stähelin and Cie.; besides the enlargements, the older portion of the building is to be supplied with heating apparatus, electric lighting and other modern conveniences.—The architect, Emil Probst, died at Berne on July 23, in his seventy-sixth year.

AUSTRIA.—New elementary schools are to be built in Vienna for boys and girls respectively; each building is to contain sixteen classrooms, a conference room, a gymnasium, etc., and they are to be completed by the summer of 1905.—A new children's hospital is to be built in Vienna; the building will owe its existence to the grants of Herr Bernard Pollak.

PUBLIC WORKS IN PANAMA.—In accordance with a law dated May 20 last, the National Convention of Panama has voted a sum of \$5,250,000, or approximately 325,000,000 of the money received for the Canal concession, for the purpose of carrying out improvements throughout the Republic. Of this sum about 100,000,000 is assigned to improvements in the province of Panama, the remainder to be divided in varying proportions amongst other provinces, the expenditure to be spread over a period ending September 30, 1905. The improvements contemplated in Panama itself consist of a capitol, or Government palace, a public prison, a theatre, public lavatories, a municipal palace, a library and museum, a university, and a palace of justice; likewise repairs and enlargements of the existing Government palace, schools, repairs to various important thoroughfares, a number of police stations, and sundry smaller matters, such as the extension of the electric light system, etc. The improvements in the provinces will comprise a wholesale construction of roads, involving some sixty or seventy bridges, many of them of iron (presumably, for the most part, of small dimensions), and numerous schools, electric light installations, hospitals, municipal buildings, police stations, etc. A number of architects and engineers are to be despatched to the various provinces within a period of two months from the date of the promulgation of this law, and are to prepare plans and estimates for these undertakings, to be presented to the Government Department of Public Works not later than December 31 next, after which bids for the execution of the work are to be solicited.

MISCELLANEOUS.

A REVIVAL OF PNEUMATIC DESPATCH IN LONDON.—A measure will be promoted in the course of next Session for powers to adopt the American system of the Batcheller Pneumatic Tube Company, within the limits of the four miles radiating from Charing Cross. Sir John Wolfe Barry is appointed engineer to the undertaking. The first tube, laid between Euston terminus and the Northern District Post Office, had a cross-section of about 1 ft. 4 in., and proved so efficient that the Pneumatic Despatch Company essayed a similar project in 1859-60, when Mr. Latimer Clarke and Mr. T. W. Ransom, as joint engineers, laid a tunnel, constructed by Mr. John Aird, of cast-iron \square -shaped sections, 1 in. thick, and measuring 4 ft. by 4 ft. 6 in., beneath Newgate-street, Holborn, New Oxford-street, Tottenham Court-road, Hampstead-road, and Drummond-street, for carrying mails and parcels to Euston terminus from the General Post Office. The line extended through a distance of 2½ miles; the engine-house was situated between High Holborn and Whetstone Park, at the rear of the Soane Museum. But by reason of the leakage of air and other mechanical defects in the tunnel, the engine, albeit worked up to 800 horse-power, proved to be unequal to the task of maintaining the enormous vacuum required for the desired speed of the train of cars. Five years ago Mr. George Threlfall, consulting engineer, propounded a scheme for using that tunnel for an electrical train, controlled from a central station, carrying nine tons in each of its four or five cars, at a rate of about thirty-five miles an hour, and for fitting a smaller pneumatic tube within the roof, through which "late" letters could be flown to Euston station in less than two minutes. He and Mr. George Neill had made an exploration of the tunnel, which they found in good condition, though obstructed with brickwork in places, and full of water underneath Holborn Viaduct. The portion beneath Tottenham Court-road had been used for the conduct of electric light mains; in another portion a brick wall had been built to support a sewer. The present project relates to an initial system of 12-in. tubes, laid in double lines, extending over 95 miles, with 150 stations, at an estimated cost of 3,000,000.

CAMBRIDGE UNIVERSITY.—The Museums and

Lecture Rooms Syndicate state in their annual report that the departments of medicine, surgery, pathology, and pharmacology have taken over the new buildings of the Medical Schools which were recently opened by the King, and that the contents of the Woodwardian Museum are now deposited and arranged in the Sedgwick Memorial Museum. The Woodwardian Museum, the Arts Schools, and the ground for the block designed for the new Senate House, are now at the disposal of the Library Syndicate, who have effected some structural alterations of two rooms in Scott's building for the housing of the Acton Library lately presented by Mr. John Morley to the University. The greater part of the books have already been received, to an amount whose weight exceeds 40 tons. Some valuable donations of Oriental MSS. have been made during the past twelve months, amongst the benefactors being Mrs. Lewis, Mrs. Gibson, Syed Ali Bilgrami, University teacher of Marathi, and the Maharajah of Ulwar.

CEMENT NOTES.—There are numerous references to the cement trade in the consular reports recently received at the British Foreign Office, and we subjoin some examples. Mr. Consul Kessel writes from Cadix:—"The chief work in the cement factory has been the production of bricks for the enlargement of the buildings and the manufacture of some 6,000 tons of cement. It is expected to reach an annual output of 20,000 to 30,000 tons. The realisation of this estimate has been delayed, owing to the non-arrival of certain necessary machinery. A dividend of 4 per cent. has been paid to the shareholders." Mr. Vice-Consul Sterne writes from Novorossiisk, in the Batoum district:—"I have been unable to obtain the figures for cement for 1903, but I am informed that the total production was 1,500,000 barrels, or 241,936 tons."

Reporting on the trade of Hanover, the Vice-Consul remarks that the cement business has shown scarcely any improvement, although it has been paid to the shareholders. "The unfortunate conditions prevailing in the United States—e.g., building strikes and over-production—there was a serious falling-off in exports, though this was more than counter-balanced by the increased demands of the home trades. The Vice-Consul at Los Angeles, U.S.A., writes:—"The bulk of the cement used here is now of American manufacture. American cements have driven the British article out of the market." On the other hand, Mr. Allen, reporting from San Diego, says:—"The cement imports amounted to 24,769, showing an increase of 7,341, over 1902; of this 16,713 came from the United Kingdom, and 8,056 from Belgium and Germany." Mr. Consul Laidlaw, describing the commerce of Portland, Oregon, U.S.A., observes that:—"The trade in cement was large during the year 1903, and California-made cement is being shipped to an increasing extent. It is packed in bags and sells at 1s. to 1s. 6d. less than the best foreign, which there is a strong probability it may supplant in the near future. Some quantity was received which, through a mistake in manufacture, would not set, but this has been remedied, and the quality is well spoken of. Japanese cement was received in this market to the extent of 8,541 casks, and is considered fair quality, selling at about the price of imported natural cement. German cement has the best market, and of this there were received here 101,650 casks. Of Belgian cement the receipts were 40,920 casks, and of British 30,235 casks. Best brands of cement sold at an average of 10s. 3d. per cask for artificial, the natural being from 1s. to 1s. 6d. less. A larger trade in fire-bricks was done at an average price of 5s. 10s. per 1,000. So far this trade is entirely British."

The Vice-Consul at Seattle, Oregon, writes:—"The question of cement imported to this port is one to which the attention of British exporters should be paid, for cement is in great demand, and will bring for years to come. There are several large buildings contemplated, including a 200,000 Government building, a public library to cost 40,000, and a railway tunnel, now in course of construction, to cost 200,000. In 1903 all the cement imported came from Germany."

FRANKFORT MUNICIPAL BUILDING ENTERPRISE.—The population of Frankfort-on-Main is rapidly increasing. According to an estimate published by the Chamber of Commerce early in 1904, it then amounted, including the suburbs, to 313,600. The rapid increase has at times produced a scarcity of dwellings, more especially small dwellings, and this scarcity has led to the pooling of suburban building sites under the Lock-Adickes, which, roughly speaking, provided the municipality with the power of laying out new streets in quarters previously undeveloped owing to the great number of small landed owners there who could not be prevailed upon to sell at a

fair price, nor could come to terms among themselves. The municipality has also, since 1888, as a further remedy for the scarcity of small dwellings, built houses to be let to their officials and workmen. The municipality has also furthered the construction of small dwellings by granting prolonged leases of municipal building sites; by granting building loans, in some cases up to nine-tenths of the capital sum required; by taking shares in such building enterprises; by granting mortgages; by guaranteeing the interest due on the capital sums, provided always that the moneys were required for the construction of smaller (artisan) dwellings. In March, 1902, the municipality owned forty-seven dwelling-houses for officials, etc., in the construction of which 1,500,000 marks had been spent. The guarantees given for capital and interest amounted to 5,500,000 marks; shares had been subscribed for to the extent of 500,000 marks. Besides these sums the municipal savings bank has advanced moneys in the nature of mortgages on the same kind of buildings to the extent of 625,000 marks. The municipality-owned houses are said to be a good investment, and need no financial assistance. The rents charged for the flats contained in these houses (as far as they are let to municipal officials, who have a claim upon the flats if they draw a salary the initial amount of which does not exceed 2,500 marks) are as follows:—198 flats with two rooms, 18m. 50pf. per month; 46 flats with three rooms, 34m. to 38m. per month; 7 flats with five rooms, 75m. to 87m. per month. Besides these, the town had in March, 1902, the first call upon 20 flats with one room (no kitchen), 9m. per month; 122 flats with two rooms, 25m. 50pf. to 31m. 50pf. per month; 41 flats with three rooms, 40m. 50pf. to 48m. per month; 30 flats with four rooms, 60m. per month. The rents of houses are said to be a good investment, and need no financial assistance. The rents charged for the flats contained in these houses (as far as they are let to municipal officials, who have a claim upon the flats if they draw a salary the initial amount of which does not exceed 2,500 marks) are as follows:—198 flats with two rooms, 18m. 50pf. per month; 46 flats with three rooms, 34m. to 38m. per month; 7 flats with five rooms, 75m. to 87m. per month. Besides these, the town had in March, 1902, the first call upon 20 flats with one room (no kitchen), 9m. per month; 122 flats with two rooms, 25m. 50pf. to 31m. 50pf. per month; 41 flats with three rooms, 40m. 50pf. to 48m. per month; 30 flats with four rooms, 60m. per month. The rents of houses are said to be a good investment, and need no financial assistance. Up to the present the municipal official dwellings have always been well let.

BUILDING TRADE IN GERMANY.—The building trade (writes Mr. Consul-General Oppenheimer) continued lively in 1903, for the average annual increase in the population of 800,000 to 900,000 must be provided for. The trade received a fresh impetus also from the policy of sanitary improvement carried out by many municipal authorities. New thoroughfares are cut through old districts, thus bringing down great numbers of small dwellings, and many old houses are closed by authority, so that numbers of the population are compelled to find habitations in new quarters. Such measures have produced in the population a certain taste for modern requirements, and the rapidity with which new blocks of artisans' dwellings are let, though often at some distance from the factories and workshops, proves that the working classes of the population have been educated in this respect. The supply of extended new quarters has been facilitated by a tendency for speculative building to be carried out by financially-strong societies formed for that purpose, rather than by individual speculators. The activity in the building trade has, of course, influenced the immediately dependent trades, such as iron, stone, and bricks; the benefit has spread also to the glass and wood industries, and to those embracing interior decoration; but the cement industry, owing to great over-production, has not benefited.

OPEN SPACES.—In response to representations made by the Hampstead Heath Extension Committee, the St. Pancras Borough Council have agreed to contribute 500l. towards the fund of 59,000l. for the acquisition of the 80 acres belonging to the Eton College trustees on the north-western boundary of the heath; the balance still to be collected amounts to 5,000l.

—The Metropolitan Public Gardens Association have, in co-operation with the Billingsgate Christian Mission, opened to the public the ground appertaining to the former St. Botolph's Church, Billingsgate, and have obtained the insertion of an amendment in the Bill for the abolition of the Church of St. Bartholomew-the-Less in West Smithfield, whereby the existing area of open space will not be curtailed by the scheme for rebuilding within the precincts of the hospital.—The Westminster City Council are prepared to maintain the garden of Colden-square, Soho, in the event of its being acquired and laid out by the Association; the Association have undertaken to lay out the churchyard of St. Nicholas, Deptford, subject to a guarantee for its upkeep; to restore the churchyard of St. Mary, Whitechapel, and to take steps for preserving, as an open space and garden, the disused burial ground, nearly 3 acre in extent of Wycliffe Chapel, in Philpot-street, Stepney.—The National Trust have accepted from Mr. W. H. C. Nares the gift of a tract of about 21 acres on the summit of Rockbeare Hill commanding a view of the Exe valley, near Exeter, which will in future be called "Prickly Pear Blossoms Park" after Mr.

Nation's book of poems; and have acquired about 3 acres on a southern ridge of Crockham Hill, near Westerham, affording a beautiful prospect over the weald of Kent as far as Leith Hill and Haslemere; the purchase was made by Miss Octavia Hill with a sum of money bequeathed to her "in memoriam," for use at her discretion.—A park of about 40 acres has been opened at Romford, whereof one-half was bought by the Council for 3,000l. and the other half was given by Mr. H. H. Raphael.—Colley Hill, Reigate, a tract traversed by the ancient road afterwards known as "Pilgrims' Way," in its course through Surrey to Canterbury, is now secured to the public by Mr. G. Taylor's gift, in commemoration of Queen Victoria's reign.—An appeal is made for 12,000l. to secure 700 acres marching for about one mile with Ullswater Lake, and comprising Gowbarrow Park and ravine, and the cascade by Aira Force; the property is offered for that sum to the National Trust by Mr. Henry Howard, of Greystock Castle.

ARBROATH ABBEY BUILDINGS.—On the 4th inst. Mr. W. P. Oldrieve, of H.M. Office of Works, had a conference with the Property Committee of Arbroath Town Council at the Abbey in connexion with the proposal that the part of the Abbey buildings in the custody of the Town Council, which includes the Abbot's House and the Regality Tower, be handed over to H.M. Board of Works. It is the desire of the Board of Works to have the buildings transferred to them, so that adequate attention may be given to their preservation. Another aim of the Board of Works is to make the whole of the buildings accessible to visitors. The Regality Tower would be made accessible from the Abbey Pond, and visitors be enabled to get to the top of it. Whatever might be the ultimate intention regarding the Abbot's House, which is uninhabited, nothing would be done to disturb present arrangements, except to repair the Abbot's kitchen, so that visitors might more comfortably inspect it. It would be to the advantage of the town to have these places, which are strictly exhibition buildings, made as attractive as possible to visitors, and some parts of the buildings are greatly in need of the attention which the Board of Works would be able to bestow upon them. The matter will now be brought before the Town Council in definite form.—*The Scotsman.*

BUILDING BY-LAWS, LITTLEHAMPTON.—At the last monthly meeting of the Littlehampton Urban District Council, Mr. Etherington moved the adoption of a recommendation by the Works Committee that the Local Government Board be asked to sanction an alteration of the building by-laws to allow the construction of garrets in small houses without an extra thickness of wall being required. Mr. Pile seconded, and said the alteration was intended to benefit the tenants of small houses, who required all the room they could possibly get during the season. If this was done the buildings would be strengthened by the additional timber used on the roof. As a matter of fact, it was found that in the past this idea had been adopted by builders surreptitiously. Mr. Blanchard said he considered the proposal would encourage jerry building, and also expressed an opinion that someone was very much to blame if their by-laws had been evaded as Mr. Pile stated. Mr. Jones supported Mr. Blanchard in his objection, but the other members of the Council approved, and the alteration of the motion was carried. An elevation of the proposed free library building was submitted by the surveyor, and approved by the Council, the cost being estimated at not exceeding 2,000l.—*Sussex Daily News.*

WAR MEMORIAL, CHESTER.—The memorial, which has been placed in the south transept of Chester Cathedral, in memory of the men of the Cheshire Regiment who fell in the Boer War, was unveiled by Earl Roberts on the 1st inst. The memorial consists of a tablet of white English alabaster and white Carrara marble, and has been designed and executed by Mr. Thomas Rudge, of London.

EXPORTS OF WOOD FROM SWEDEN.—Mr. MacGregor, British Consul at Stockholm, sends some interesting notes on the condition of the timber trade there. He remarks that, in 1903, white wood deals did not sell well. This was owing to the fact that white wood from the southern part of Europe has, to a considerable extent, taken the place of that grown in the north. Though inferior to the latter as regards quality and shape, the southern product possesses certain advantages as regards longer average dimensions and cheapness. With respect to red wood, considerable quantities of deals, battens, and planed boards were sold early in the season, and at remunerative prices, to South Africa. When, later on, wood from the White Sea and Canada was offered for sale at lower

rates, the Swedish goods did not sell well, though prices at Stockholm, it is stated, gradually sank from 15s. to 1l. per standard under those previously obtained. In spite of all this, the exporters were unable satisfactorily to dispose of their heavy stocks. British buyers, and especially those in London, adopted a very reserved attitude throughout the year. French importers also were very cautious in placing their orders, but purchased about the average yearly quantity. Swedish exporters are said to have generally succeeded in keeping up prices for sawn wood during the first half of the season; but as regards planed wood the quotations fell considerably. The market for the latter goods improved somewhat in the autumn, when there was a slight rise in prices, especially for wood sent to the Cape. For some years the market for floorings has been in a very depressed state. This is attributed to keen competition and the want of anything like co-operation on the part of the different exporters. Fears are therefore entertained that a once remunerative industry will be ruined. According to the report of the Swedish Sawmill and Wood Exporters' Association, the export of deals, battens, and boards, planed and unplanned, from the whole of Sweden was, in 1903, 1,039,462 standards, an increase of about 35,000 over the previous year. The quantity shipped to the United Kingdom was 440,718 Petersburg standards, which was a decrease of about 8,500 standards as compared with the year 1902. A marked increase took place in the export of wood to Denmark and Spain, and, in a less degree, to France, Germany, Netherlands, and Portugal. As compared with 1902, not half the amount of wood goods was exported to Australia, whereas the export to South Africa and Egypt increased by no less than 30,500 standards. During 1903 a large combination of sawmill companies and firms took place within the district of Lulea. The amalgamated company has in this way obtained control of large forests and of about 70 per cent. of the total shipment of the wood from that district.

Legal.

POINT UNDER THE LONDON BUILDING ACT, 1894.

The case of Leadbetter and others v. the Mayor of St. Marylebone and others came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 6th inst.

This was an appeal from an order made by Mr. Justice Phillimore, in chambers, granting an interim injunction restraining defendants from increasing the height of a party-wall between Nos. 33 and 34, John-street, Edgware-road, without giving notice to the plaintiffs, as adjoining owners, in accordance with the provisions of the London Building Act of 1894. The motion, by consent of the parties, was treated as the trial of the action. It appeared that, on April 7, 1902, a building agreement was come to between the freeholders of No. 33, John-street, and one, Eccleston, to be followed up by a lease for thirty years. Eccleston wanted to rebuild No. 33, and, for that purpose, it was necessary to deal with the party-wall. Notice was accordingly given to the defendants under the London Building Act. The defendants intended, at some future time, to build workmen's dwellings on the site of No. 34, and they desired that the party-wall should be strengthened, and certain alterations made in it with a view to their ultimately building these dwellings. The parties, being unable to agree, each side appointed a surveyor to act as arbitrator. In the result, these gentlemen made an award in which they directed that the party-wall should be altered in accordance with the wish of the defendants, the additional thicknesses to be on the defendants' land, and carried out at their expense. The award further directed that the defendants should be at liberty at any time to build their proposed premises to such a height as they desired; in case of dispute, either party were to apply to the arbitrators. These directions were carried out, and in September, 1902, Eccleston parted with his lease to Leadbetter. The defendants had pulled down No. 34, and intimated that they intended to build on the top of the party-wall. Plaintiffs thereupon said they were entitled to a party-wall notice. Defendants denied this, and said they were entitled to do as they wished under the award. The plaintiffs replied that, in so far as the award dealt with a future user of the party-wall, it was *ultra vires*. The question, therefore, was whether the award on this point was binding, or whether, as the plaintiffs alleged, they were entitled, as adjoining owners, to a party-wall notice.

Mr. English Harrison, K.C., and Mr. G. A. Scott appeared for the appellants, and Mr. J. Eldon Banks, K.C., and Mr. Poyser for the respondents.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, said that Mr. Justice Phillimore had held that the award, so far as it dealt with a future user of the party-wall, was *ultra vires*, and, therefore, bad. The plaintiffs who, since the award, had changed from the position of building owners into that of adjoining owners, were clearly entitled to insist on their right to a notice being served under the London Building Act, and to a reference in the event of there being a dispute. He thought the appeal should be dismissed, and judgment entered for the plaintiffs, with costs. The Lords Justices concurred.

CASES UNDER THE WORKMEN'S COMPENSATION ACT, 1897:

BEECHER v. BEALE AND SON.

The case of Beecher v. Beale and Son came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 9th inst., on the appeal of the plaintiff from a decision of Judge Emden, sitting at the Dartford County Court, under the Workmen's Compensation Act, 1897.

Mr. Senhouse, for the appellant, said that the only point which arose on this appeal was as to construction of the word "about," used in a certain section of the Act. He (counsel) was unable to persuade the learned County Court judge that the case was not governed by previous decisions of the Court of Appeal. If he could not distinguish the present case from those decisions, he could not succeed on this appeal. The plaintiff was a foreman of navvies, and had been engaged for a considerable time in building some shops, and his employment was entirely on the buildings which were being erected. At the moment of the accident the plaintiff happened to be, by chance, not on the building, or, in the ordinary acceptance of the term, not in proximity to the building. The plaintiff, at the time the accident happened, had gone down to the railway station, which was 500 yds. away from the building, to see after some cement, and that was to oblige his foreman. With that exception the plaintiff had had no work to take him off the building. It was admitted that the terms of the man's employment was that he should be employed entirely on the building. The learned counsel contended that the accident arose out of the plaintiff's employment, and came within the meaning of the words of the section of the Act "on, in, or about" a building, although the plaintiff happened not to be there at the precise moment of the accident.

At this stage the Master of the Rolls said that for a workman to recover compensation under the section he must be "on, in, or about" a building. In the present case the plaintiff was not physically approximate to the building.

Mr. Senhouse said he could not put the case for the plaintiff higher than he had done.

The Master of the Rolls: I think that this case is entirely consistent with the previous decisions in this court, and that the appeal fails.

The Lords Justices concurred, and the appeal was accordingly dismissed, with costs.

PATTISON v. WHITE AND CO., LTD.

The case of Pattison v. White and Co., Ltd., came before the Court of Appeal, composed of the Master of the Rolls, and Lords Justices Stirling and Mathew, on the 5th inst., on the defendants' appeal from an award of the Judge of the Darlington County Court under the Workmen's Compensation Act, 1897, in favour of the plaintiff.

The facts were as follows:—The defendants were engaged under a contract with the Darlington Corporation in the construction of a system of light railways at Darlington. Clause 30 of the specification provided that the sand used for the permanent way construction was to be the best river or pit sand, and defendants selected a sandpit about 3½ miles or 4 miles from the place where they were laying the permanent way, and they contracted with a man, named Wilkinson, to cart for them the sand from the pit to the railway works. A man named Pattison, who was employed by Wilkinson as a carman to cart the sand, while engaged in driving a cart from the pit to the works fell from the cart and was run over and killed. The accident occurred about 2½ miles from the works. The plaintiff, the widow of Pattison, claimed compensation from defendants under the Act of 1897, contending that the accident happened

"on or in or about" the engineering work within section 7 of the Act. The defendants admitted that they were "undertakers" in respect of the engineering work of constructing the railway, but they contended that, as the accident happened a long way from the works, the employment at the time of the accident could not be said to be "on or in or about" the engineering work, within section 7 of the Act. The County Court Judge held that the employment of the deceased man at the time of the accident was about the engineering work, notwithstanding the fact that the accident occurred at a considerable distance from the scene of the work where the said work would be ultimately unloaded or used. He accordingly made an award in plaintiff's favour for 187*l.* 4*s.* From this decision the defendants now appealed.

Mr. A. Powell, K.C., and Mr. W. Addington Willis appeared for the appellants, and Mr. Manisty, K.C., and Mr. G. Taylor for the respondent.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, said that, in his opinion, "on or in or about engineering work" denoted locality. In each limb of the definition of engineering work, following in this respect the scheme of the Act, physical locality was pointed out as that on or in or about which the employment must be at the time of the accident. That was laid down in a series of decisions in this court, and it was not competent for the County Court Judge to emancipate himself from those decisions. He thought the appeal should be allowed. The Lords Justices concurred.

POINT UNDER THE FACTORY AND WORKSHOP ACT, 1891.

THE case of *Hornor v. Franklin* came before Mr. Justice Darling, sitting without a jury in the King's Bench Division on the 10th inst., an action by the plaintiff against the defendants, Messrs. J. and L. Franklin, to recover 165*l.* 12*s.* alleged to be due under covenants contained in a lease, dated May 8, 1890, and made between the plaintiff and the defendants. Defendants denied liability.

It appeared that the plaintiff owned two warehouses or sheds, which constituted a factory within the meaning of the Factory and Workshop Acts. The premises in question were situated in Lamb-street, Spitalfields, and were let to the defendants by the lease before-mentioned. By the lease the defendants covenanted, during the term of the lease, to pay all existing and future taxes, rates, assessments, and outgoings of every description payable in respect of the demised premises (the landlord's property tax alone excepted). The plaintiff also covenanted within one month of the execution of the lease to brick up two doorways leading from the premises demised into No. 27, Lamb-street, and into the stable yard. The London County Council, on February 7, 1901, served the plaintiff with notice to carry out certain work under the Factory and Workshop Acts in respect of the premises, part of such work being to unblock the drains which had been bricked up. The plaintiff did this work at a cost of 165*l.* 12*s.*, the amount he now sought to recover from the defendants as "outgoings" within the meaning of their covenant.

Mr. Poyser appeared for the plaintiff, and Mr. R. C. Glen for the defendants.

Mr. Poyser contended that the plaintiff was entitled to recover the amount claimed from the defendants under their covenant as "outgoings."

Mr. Glen, for the defendants, contended that the expenses were not "outgoings" within the meaning of the covenant. He also contended that, by section 7, sub-section 2 of the Factory and Workshop Act, 1891, the plaintiff should have applied to a County Court Judge, that being a condition precedent to his right to recover any part of these expenses from the tenants.

In the result, his lordship, in giving judgment, said he had come to the conclusion that the plaintiff ought to go to the County Court, and get a decision from the County Court Judge. He relied upon the words of the statute for saying that the plaintiff was bound to go to the County Court, and could not come to the High Court if he chose. The statute gave the plaintiff the only remedy that he had got, and it did not give him a remedy of any kind, except in the County Court. For these reasons he gave judgment for the defendants, with costs.

A stay of execution was granted, with the view to an appeal.

SOUTH KENSINGTON BUILDING DISPUTE.

In the Court of Appeal, composed of Lords Justices Stirling and Mathew, on the 8th inst., the case of *Bullingham v. Pocklington* was

heard on the appeal of the plaintiff from an order of Mr. Justice Bucknill in Chambers.

Mr. Montague Lush, K.C. (Mr. Grosier with him), said that the order the plaintiff objected to was one depriving him of his right to have the action tried before a judge of the High Court and a special jury. The learned judge had ordered the case to be referred to Mr. Verey, the Official Referee. His submission was that he had no jurisdiction to make such an order. The action was brought by the plaintiff, a photographer, at South Kensington, against the defendant, who owned the adjoining house, for damages for negligent work in consequence of which plaintiff's house began to settle. There was a contract between the parties that, if the defendant did certain work, he should put the plaintiff's premises right. The defendant's case was that he had not been negligent, and that it was a mere coincidence that the subsidence occurred. The learned counsel said that there was nothing at all to entitle the defendant to have the case tried before an official referee.

Lord Justice Stirling: You are suing on a contract to make good any damage?

Mr. Lush said that was so. The defendant denied the contract and the negligence. His (counsel) said the plaintiff's premises had been very seriously damaged.

Lord Justice Stirling: If your case is based on negligence I think that is a proper case to be tried by a jury.

Mr. McCall, K.C., on behalf of the respondent, submitted that the order made by the learned judge was right. The learned judge had affirmed the order of the Master, sending the case to an official referee, and the parties agreed on a special referee, and the Master's view was that the case should be decided by a surveyor. The ground on which he made the order was this:—The houses of the plaintiff and defendant adjoined, and before defendant rebuilt his premises he gave the usual party-wall notice under the Metropolitan Building Act, and thereupon the surveyors were appointed, and the contract was entered into, under which, in the usual way, defendant became liable to compensate for any disturbance, based on the under-pinning and using the party-wall. The only question here was, whether the under-pinning or alteration of defendant's premises actually caused the damage. The fact was that the plaintiff's premises had fallen away, not towards the defendant's work, but in the opposite direction where the Metropolitan and District Railway was, but he (counsel) said that was a question to be decided by a surveyor. He thought it was clear that if the damage to plaintiff's house was caused by the disturbance of the defendant, the plaintiff's house would inevitably have come towards the disturbance instead of going the other way. It was difficult now to see the premises because the plaintiff's and defendant's premises were closed up altogether, the underground work was now covered up, and on the other side it was impossible to see it without the permission of the Metropolitan and District Railway. He submitted that this case came within the section which enabled the court to send it to the Official Referee, as it involved local investigation, and which could not, in the opinion of a judge, be conveniently dealt with by a jury. There would be no difficulty in getting a view by an official or special referee, but there would be great difficulty in getting a view by twelve jurymen. The defendant would have been perfectly satisfied to have the case sent to a special referee.

In the result their lordships held that it was a case which the plaintiff was entitled to have tried by a judge of the High Court and a jury, allowed the appeal, and made the costs, both in that court and in the court below, costs in the cause.

DAMAGE TO PROPERTY BY FLOODING.

THE hearing of the case of *Benning v. the Ilford Gas Company* concluded in the Court of Appeal, composed of the Master of the Rolls, and Lords Justices Stirling and Mathew, on the 4th inst., on the application of the defendants for judgment or new trial on appeal from verdict and judgment at trial before Mr. Justice Grantham and a special jury, in the King's Bench Division. The case was reported in the *Builder* of April 23 last.

In this case the plaintiff sought to recover from the defendant damages for injury done to his property by an alleged breach of a statutory duty and negligence of the defendants, and also by the defendants doing certain acts to the Aldersbrook, causing water to accumulate upon land, thus creating a nuisance.

Defendants, by their defence, denied that they had been guilty of any nuisance, negligence, or breach of statutory rights.

It appeared that the plaintiff owned property at Ilford, situate on land near the Aldersbrook. In June, 1903, his land was flooded, and his property damaged. Plaintiff's contention was that the defendants were bound to keep in repair a wall on the banks of the Aldersbrook, constructed to protect the land from floods, and that in June of last year, owing to the defendants' acts, the wall gave way and the land was flooded, and his property damaged. Running nearly parallel with the Aldersbrook was the river Roding. Defendants had obtained Parliamentary powers to use some of the land between the Roding and the Aldersbrook for the purposes of their undertaking. The powers granted were conditional on the defendants providing a cutting to carry away water in flood time that formerly flowed from the Roding to the Aldersbrook. The plaintiff alleged that defendants had used the bed of the Aldersbrook and had broken down the wall, so that when the floods of June, 1903 came, the water flowed into the old bed of the Aldersbrook and through the breach in the wall that defendants had made, and so on to the plaintiff's land. The plaintiff said that, as defendants had failed to make the cutting they should have done, they had committed a breach of their statutory duties. At the trial the jury, in answer to specific questions left to them, found that the defendants, before action had created a nuisance, that defendants had not exercised proper methods in stopping up the Aldersbrook, that defendants were not negligent in the mode of placing their mains, and that the flood in question was caused by the defendants not providing against it. Mr. Justice Grantham decided that this was a verdict for the plaintiff, and referred the case to the official referee for the assessment of damages. The defendants now appealed on the ground that the verdict was against the weight of evidence, and that the learned judge had misdirected the jury.

Mr. Lawson Walton, K.C., Mr. Duke, K.C., and Mr. Meyer appeared for the appellants, and Mr. Montague Shearman, K.C., and Mr. Crawford for the respondents.

At the conclusion of the arguments on behalf of the appellants, their lordships held that there was abundant evidence to support the verdict of the jury, and that there had been no misdirection by the learned judge. The appeal was therefore dismissed with costs.

THE BRIGHTON AND HOVE SEWAGE DISPUTE.

In the House of Lords, on the 6th inst., judgment was delivered in the case of the Brighton Intercepting and Outfall Sewers Board *v.* the Mayor, Aldermen, etc., of Hove, on appeal from an order of the Court of Appeal reversing a judgment of Mr. Justice Kekewich in the Chancery Division.

The appeal had reference to the intercepting sewer along the sea front of Brighton and some of the neighbouring districts, and the question was, whether the Borough of Hove was entitled to pass its sewage into this intercepting sewer as they asserted. The Brighton Intercepting and Outfall Sewers Board contested the claim, alleging that the sewer was constructed for a special purpose—to intercept the sewage from certain defined districts—and that the right to pass the sewage from any outside district was never contemplated as part of the original scheme. The case depended chiefly on the construction to be placed on local Acts of Parliament and orders of the Local Government Board. Mr. Justice Kekewich held that the Borough of Hove had failed to establish the right they claimed, but the Court of Appeal reversed his decision, and gave judgment in favour of the claim of the respondents to discharge the sewage of Hove into the intercepting sewer. Hence the present appeal of the Brighton Intercepting and Outfall Sewers Board.

The Lord Chancellor (whose judgment was read by Lord Macnaghten) said that, after long consideration, and contrary to the impression he originally formed, he had come to the conclusion that the judgment of the Court of Appeal was right, and ought to be affirmed. The awkward collection of statutes with the powers of local bodies produced an impression of confusion, and of conflicting authorities which it was extremely difficult to disentangle; but he could not resist the reasons given by the Court of Appeal for the judgment at which they had arrived.

Lords Macnaghten, James of Hereford, and Lindley concurring, the appeal was dismissed, with costs.

ACTION BY THE URBAN DISTRICT COUNCIL OF WEYBRIDGE.

THE case of the Attorney-General and others *v.* the Urban Electric Supply Company, Ltd., came before Mr. Justice Joyce in the Chancery Division on the 3rd inst., on a

tion by the plaintiffs, the Attorney-General, and the Urban District Council of Weybridge for an injunction to restrain defendants until the trial from supplying electrical energy from their power-station at Weybridge beyond the urban district of Weybridge, and from breaking up any streets in the district for the purpose of laying down electric cables, service lines, or distributing mains for the supply of electricity or electrical energy outside the district.

The facts were these:—The Urban District Council of Weybridge are the sanitary and lighting authority for the district, and the defendants, having obtained a provisional order under the Electric Lighting Acts of 182 and 1838, giving them powers to supply electricity in the urban district of Weybridge, by another provisional order, secured this year, received similar powers in regard to an adjoining district of Walton-on-Thames, for the purposes of their Weybridge undertaking defendants erected a power-station within the urban district of Weybridge, and took up the streets in the district so as to lay electric mains for the supply of electrical energy to the district. Defendants now suggested supplying the district of Walton-on-Thames from their power-station in Weybridge, and for that purpose to break up the streets in Weybridge to lay the additional cables which would be required. The Urban District Council of Weybridge said that as it would necessitate the excavation of their roads, an increase in the size of the Weybridge generating station, and an increase of vibration and annoyance to the residents, they were entitled to the injunction claimed. After hearing the arguments of counsel, his lordship granted an interim injunction, restraining the defendants until the trial of the action from exercising any of the powers conferred by the Weybridge Electric Lighting Order, or by means of lines or works laid down, or erected under such powers, supplying energy outside the area of supply mentioned in the said order, or breaking up streets within the area for the purpose of laying lines for the supply of energy unless until the defendants should be licensed to do by the Board of Trade. Mr. Hughes, K.C., and Mr. F. Newbolt appeared for the plaintiffs, and Mr. Younger, C., and Mr. Clouston for the defendants.

THE WHITEHALL PAVING DISPUTE.

THE case of Alcott v. the Mayor, etc., of Westminster came before Mr. Justice Phillimore in the King's Bench Division on the 11th inst., on two summonses. In the first the plaintiff asked for an injunction to restrain defendants from interfering with his wood-paving in Whitehall, and for the appointment of an independent engineer, other than the engineer nominated in the contract between the parties, for the purpose of deciding certain questions which arose with regard to the paving. The plaintiff's case was that, when bad-paving had been laid and it became defective by reason of bad foundations, he is not liable to maintain it. His complaint is that defendants had served him with notice to repair, and had afterwards employed a firm named Messrs. Mowlem, to repair the foundation and the wood-paving. His lordship said that, though the plaintiff is entitled to do the repairs himself, he had refused to do it. He was therefore not entitled to an injunction. He thought the plaintiff must be given notice to repair, and might assent or decline. In the cases in which the plaintiff declined, defendants would be at liberty to repair after giving plaintiff notice of their intention, so that the plaintiff might inspect and watch the work as it was being done.

In the second summons taken out by the defendants for an injunction to restrain the plaintiff from raking up the cement beneath the paving, the plaintiff, on certain terms, gave an undertaking not to interfere with the concrete. His lordship directed that the costs of both summonses should stand over till the trial. Mr. Montague Lush, K.C., and Mr. Daldy appeared for the plaintiff, and Mr. McCall, C., and Mr. Morton Smith for the defendants.

DISPUTE AS TO PAVING EXPENSES.

IN the King's Bench Division last week Mr. Justice Bigham delivered judgment in a case of the Mayor, etc., of Hampstead v. the Midland Railway Company, on a special case stated for his opinion of the court on a question of law arising in the action. The action was brought by the plaintiffs to recover from the defendant Company £1000. 12s., the apportioned amount they alleged to be due from the Company as the estimated expenses of paving a portion of a new street, called Westbere-road, Hampstead.

The facts were shortly these:—The plaintiffs, on June 4, 1903, resolved to pave Westbere-road, and on September 25 served the defendants with notice demanding from them the sum alleged to be due from defendants as the owners of land "bounding or abutting" on the new street. Defendants contended that they were not the owners of the land in question within the meaning of the Metropolis Management Acts, 1855 and 1862, and therefore not liable for the expenses in question. It appeared from the special case that the defendants acquired the land, and held it subject to the provisions of section 18 of the Midland Railway Act, 1900, and which provided for the protection of the owner that the Company should not use any part of the sidings to be placed on the land acquired from him for any purpose except for the purpose of empty passenger trains; that the Company should acquire all the land of the owner up to Westbere-road, and should leave a strip of land 20 ft. wide along the whole length of Westbere-road, and should, at their own expense, plant and maintain the same with shrubs and trees to the reasonable satisfaction of the owner, and also fence off the land from the Westbere-road by an iron fence, 7 ft. high, the planting and fencing to be carried out within one year from the Company getting possession of such lands. The Company duly acquired the land referred to, and left a strip of land, 20 ft. wide, along and contiguous to the whole length of the west side of Westbere-road, and dealt with it in the manner provided by the section. They fenced off the land from the Westbere-road by an open, unclimbable fence, 7 ft. high, and planted a quick-set hedge immediately inside the fence along its whole length. On the other side of the strip of land, the land sloped down to the edge of the railway, a cutting having been made for the purpose of its construction. The plaintiffs contended that the defendants were "the owners" of the land "bounding and abutting" on the new street within the meaning of the Metropolis Management Act, and were therefore liable for the amount claimed. The defendants, on the other hand, contended that the land was not land bounding or abutting on the street within the meaning of section 77 of the Metropolis Management Act, 1862; that the land was subject, in perpetuity, to the burden of public and private rights which deprived it of all beneficial value to the defendants, and was not such land as was intended by that section; and that the defendants were not the owners of the land within the meaning of that section, and sections 105 and 250 of the Metropolis Management Act, 1855.

Mr. Macmorran, K.C., and Mr. Courthorpe-Munroe appeared for the plaintiffs, and Mr. Montague Lush, K.C., and Mr. William Wills for the defendants.

Mr. Justice Bigham, in giving judgment, said he had looked into the cases bearing on the subject, and the result was that, when land was incapable of yielding rack-rent by reason of some public use, on or over such land, the owners of such land were not the owners of land within the meaning of the Metropolis Management Acts, and thus not liable to contribute, in respect of such land, to the expenses of paving a new street. But, where the burden of the land was imposed for the benefit of some individual or set of persons, the owners of such land were not relieved from having to contribute towards those expenses. In the present case the burden was placed on the land in question for the benefit of a Mr. Powell-Cotton by a private Act of Parliament, and it was competent for him by contract with the defendants to release them from their obligation towards him in respect of the land. In the other case, nothing but an Act of Parliament could release the land of the burden. He thought, therefore, that the defendants' contention failed, and he gave judgment for the plaintiffs for the amount claimed, with costs.

A stay of execution was granted with the view to an appeal.

ACTION BY A CIVIL ENGINEER FOR FEES.

IN the King's Bench Division, on the 8th inst., Mr. Justice Lawrence delivered a considered judgment in the case of Robinson v. Cadogan, an action by Professor Henry Robinson, the well-known civil engineer, against Earl Cadogan, to recover 401*l.* for professional services rendered in 1903 in connection with a sewage scheme of the Corporation of Bury St. Edmund's. The defence was that the plaintiff had exceeded his instructions by preparing an alternative scheme to that proposed by the Corporation, and that his charges were excessive and unreasonable. The facts of the case and the evidence given were fully reported in last week's issue of the *Builder*.

Mr. Justice Lawrence, in giving judgment, after stating the facts and reviewing the evidence given at length, said that, in his opinion, the plaintiff's claim was an exaggerated one, work being done which was absolutely unnecessary, and which the plaintiff was not retained to do. Without going into figures he thought that the sum paid into court by Lord Cadogan (120*l.*) was sufficient compensation for the services rendered, and there would be judgment for the defendant, with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

15,241 of 1903.—J. W. PHILLIPS: *Water Checks for the Shutting Joint of Casement Sashes, Doors, etc.*

Water checks, with rebated face-plate, with slot and plate at back, with pivot screw, also fixed cross-bars for the purpose of allowing a double arm between, with pivot pin screwed to bottom bar, to allow the above double arm to swing forward and backward, also a spring to force one end of double arm forward with a back casing-plate, screwed to fixed cross-bars.

15,340 of 1903.—W. W. TAYLOR: *Doors, Windows, etc.*

The door or window consists of two parts hinged together in the manner used in making partitions in rooms by means of a folding screen, by a second line of hinges parallel to the first line. The part between the first and second lines of hinges is preferably about two-sevenths of the whole width of the door or window; at the same distance as this from the second line of hinges, a pin or bolt, parallel to the lines of hinges, extends into a fixed straight bolt that runs along either of the sides of the door or window, perpendicular to the line of hinges when the door or window is shut, and causes that part of the door or window to move always in the plane that is occupied by the door or window when shut.

19,331 of 1903.—C. MAJOR: *Roofing Tiles.*

This invention relates to tiles having ribs and channels reversely disposed on the under and upper faces, so that adjacent tiles engage when they are placed together in roofing. The tile, constructed according to this invention, is provided, on its upper face, with ribs so arranged as to form a channel near the edges of the upper portion of the tile, the said channel having a passage therein at the lower end leading towards the central plane portion of the said upper face. This channel extends from the upper end of the tile to preferably about halfway down the length thereof, and on the opposite edges or sides of the tile are multiple projections and recesses reversely disposed on the two opposite sides, so that when the tiles are arranged side by side they are engaged or locked together.

19,578 of 1903.—E. WALKER: *Means for Protecting Door and other Locks.*

This invention relates to means for protecting door and other locks. The ordinary key-hole is covered with a hinged-plate, which is capable of being locked and unlocked so that it is impossible to tamper with the main lock without first operating the protector lock. The key-hole and lock of the said protector may be materially smaller than the main lock, so as to afford little scope for tampering with it. The protector-plate hinges within a metal frame and in such a manner that, when the protector-plate is locked within its frame, its edge is flush with the frame. The hinge employed for the plate is preferably an edge-hinge. The said frame for the hinged protector-plate may be secured to the door and over the key-hole of the door, by providing the top and bottom of the frame with an inwardly projecting lug-piece, which is screwed into the door.

19,741 of 1903.—H. C. WALKER: *Lifts and Hoists.*

Lifts or hoists, consisting, in the combination with the controlling gear, of an electrically-controlled locking device, adapted to engage both the controlling rope and suitably-shaped guides carried by the cage, whereby, on the interruption of the current through the locking device, such device is brought into contact with the rope of the controlling gear, so that on any movement, as between the latter and cage, a jamming action is set up.

19,998 of 1903.—L. E. BUTCHER: *Flushing Cisterns for Lavatories, Water-closets, etc.*

This consists in the combination with a flushing cistern, of a disinfectant reservoir having a discharge cock normally closed by a

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

weighted lever, which is in connexion with the operating chain of the flushing cistern, so that the cock is opened simultaneously with the operation of the flushing cistern.

4,108 of 1904.—J. SALT: *Window Frames and Sashes.*

This consists in the combination in a window frame and sashes, of vertical grooves in the frame, with racks bearing in said grooves, engaging with pinions carried in the frame, ears made with said racks, and pivots carried in the sashes and to bear in said ears.

6,479 of 1904.—J. E. GUTTERIDGE: *A Lock for Windows, etc.*

A sash-locking or fastening device, consisting of two parts, each comprising a pair of plates held at a proper distance apart, one pair being attached to one of the sashes, and the other pair to the other sash, one of the pairs of plates having a semi-circular plate turnable on a pin, in which plate is a curved slot which, on moving the said semi-circular plate across the space between the two sashes, will receive a pillar connecting the upper and lower plates to the other pair, means being provided for locking the semi-circular plate in its required position.

9,343 of 1904.—W. FLINT and A. E. FLINT: *Chimney Pots, Ventilating-shaft Tops, etc.*

A chimney pot, consisting of an up-take tube, having lateral openings or apertures in two of its opposite sides, and an inwardly rising guide-plate, or baffle, in connexion with each lateral opening.

10,517 of 1904.—G. H. BOOTH: *Construction of Register Grates.*

In carrying out this invention a set of one or more bars is made, into which hooks are placed at the back of their upright sides which fit into a series of two or more slots formed in the upright space of the fireplace, thus holding the bars in position for use.

15,137 of 1904.—J. GREEN and W. GREEN and Co., LTD.: *Cooking Ranges, and the like.*

A cooking range, or the like, consisting in the combination with an oven having mains for being heated from a fire, of a recess at the bottom, gas-pipes leading from the recess within the oven, an air-duct from the recess to the back of the oven, with or without air-pipes adjacent to the gas-pipes.

13,214 of 1904.—C. McCALLUM: *Window, and the Fasteners.*

A window and like fastener, composed of two members capable of being clamped together by screw and nut devices, the one member having a slotted extension in which the screw works, and the other member having a boss and milled nut for jamming said screw, whereby the window can be locked either with its upper sash drawn down or the lower sash raised, or with both sashes respectively raised and drawn down within limits.

13,319 of 1904.—D. T. DONALD: *Decorative Coverings, or Hangings for Walls, or other Surfaces.*

A covering or hanging for walls, or other surfaces, composed of a face of canvas, or other woven fabric with a thickness of paper, which may have been previously ren-ered damp-proof or water-proof, pasted or cemented to the inner surface thereof.

13,446 of 1904.—G. L. ROLLINS: *Machines for Applying Cement to Stock.*

The use, in a machine for applying cement to stock, comprising a rotatable brush, a tank, having a valve, and means to open the valve to discharge cement on the brush, of a wiper, arranged between the valve and the axis of rotation of the brush on a chord of the circular path of the brush, and slotted that the bristles at the upper edge of the brush may travel therethrough the wiper wiping from the bristles excess of cement towards the periphery of the brush.

17,319 of 1904.—A. B. JOHNSON: *Improvements Relating to Manhole Covers, etc.*

This invention relates to manhole covers, and the like, and has for its object to provide a manhole cover in which there shall be an absolutely tight joint of great durability. According to the invention the cover frame is recessed so as to form an underface on each side thereof, by which the frame is mounted in the brickwork with a continuous four-sided channel protruding downwardly, within which the flange of a second cover lies. The upper part of the frame is provided with a continuous four-sided channel, within which the flange of the first cover lies. The second cover is laid upon the lower inner edge of the channel of the cover frame, upon which rubber or other packing material is laid, so that thus a dry and tight joint is secured. The second cover is pressed in position against the edge aforesaid by means of a locking-bar or bars, which may be secured upon the second

cover, and may be turned to engage with inclined surfaces provided upon the inner wall of the frame. The joint for the first cover may be made by the use of grease, tallow, sand, or any other similar and suitable material.

16,500 of 1903.—A. E. GRAY: *Construction of Tanks, Reservoirs, and other like articles.*

Tanks, and like articles, consisting in the employment of plates, in combination with a sectional frame, such plates being held in position and secured to the frame by means of angle knees or clamps, and bolts and nuts.

16,860 of 1903.—F. PLATT and L. PLATT: *Dies for Use with Tile Presses for Making Tiles, Slabs, etc.*

The construction of metallic dies, of any desired shape and size, with detachable metallic strips, triangular in transverse section, an inclined or bevelled inner side, or a curved or rounded inner side secured to their sides or peripheries for use in making tiles with bevelled, inclined, or rounded lower edges from "dust" clay, or the like suitable material, so as to reduce their area of contact when laid or placed in position, and make close joints.

19,293 of 1903.—M. J. ADAMS: *Lavatories.*

This invention consists in the arrangement for supporting the lavatory and carrying the waste, and is particularly suited to a range of basins. A hollow arm is formed which supports the basin and carries the waste liquid down to a pipe connexion placed horizontally on the wall-face, this horizontal pipe having sockets or connexions so formed that pipe connexions may unite the basins and carry the waste away.

19,724 of 1903.—J. T. WRIGHT and J. HOLT: *Flushing Cisterns for Water-closets, Urinals, and the like purposes.*

Flushing devices for water-closets, urinals, and the like, consisting in the combination of a main syphon adapted to discharge the main compartment, and an auxiliary syphon communicating with the main syphon, or with the drop or discharge pipe connected thereto, and adapted to discharge the sectional compartment, the said auxiliary syphon being perforated at or near the bend to prevent continuous syphoning.

19,736 of 1903.—F. ROUGH: *Method of, and Means for, Making Joints in all Materials, and Especially in Woodwork, water-tight, and otherwise Wind, Weather, and Rain Proof.*

A means for creating a tight joint in and between two pieces of material, consisting of making one or more strips of indiarubber, or other material, duly to fill two or more complementary grooves, formed in such pieces of material, and arranged facing each other.

22,081 of 1903.—A. EMANUEL and SONS, LTD., T. C. ROSE, and J. WOOD: *Apparatus for Testing Drains.*

The plug consists of a pair of discs (preferably mounted on wheels), connected together by a spindle or frame, and supporting the ends of a cylinder of flexible material. One of the discs is provided with means of attaching to it the push-rod and the end of a flexible pipe, the other end of which is fixed to an air-pump. In testing a drain, the plug is pushed in a distance which is known by the number of lengths of push rod employed, and is inflated by the air-pump, the drain being then filled with water. After the test-plug is deflated, it is pushed or pulled to another point, and the test is repeated, and so until the exact position of the leak is determined.

2,649 of 1904.—C. H. HUTCHINGS: *Machines for Moulding Building Blocks and Artificial Stone.*

A machine for moulding building blocks and artificial stone, consisting in the combination of the main frame, a mould-box journaled therein, consisting of a bottom side, two end sides, and a front side connected to the bottom side, a removable side opposed to the front side, and means for temporarily locking the sides together.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

July 29.—By ROBERTS, SON, & TOBY (at Yeovil).
Yeovil, Somerset.—Dorchester-rd., "The Red House Inn" and 2 a. 1 r. 20 p. l. p. £1,870

July 30.—By H. H. ARNOLD (at Norwich).
Wilby, etc., Norfolk.—"The Moat Hall Farm," 152 a. 0 r. 2 p. l. p. 1,000

August 3.—By FRASER & HOGG.
Hastings, Sussex.—9 and 10, Earls-rd., with factory adjoining, ut. 64 yds, g. 8, 11 l., y. r. 170 l. 2,225

Middest.—"Clarence Mews" (stabling), l. 1, r. 95 l. 1,400

Clapham.—1 1/4 and 1 1/2, Courtland-gr. ut. 10 yds, g. r. 6 l. 10s, y. r. 64 l. 200

August 4.—By LINNETT & LANE.
Harlesden.—22 and 24, Fairlight-av., ut. 83 1/2 yds, g. r. 12 l., y. r. 70 l. £720

August 5.—By H. V. CHRW.
Leytonstone.—11, Waltham-rd., ut. 74 yds., g. r. 6 l. 6s, e. r. 42 l. 385

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e. r. for estimated rental; w. r. for weekly rental; q. r. for quarterly rental; y. r. for yearly rental; u. t. for unexpired term; p. a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gns. for gardens; yd. for yard; gr. for grove; b. h. for beer-house; p. h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

WEDNESDAY, AUGUST 17.
Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.
Institution of Sanitary Engineers, Ltd.—Election Committee at 3 o'clock. General Purposes and Finance Committee at 5 o'clock.

SATURDAY, AUGUST 20.
Northern Architectural Association.—Visit to Sunderland.

TO CORRESPONDENTS.

F. S. (Below our limit).—E. & C. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.
We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items which have been duplicated for other journals are NOT DESIRED).

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER and not to the Editor.

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.	
Hard Stocks	1	16	0	per 1000 alongside, in river
Bough Stocks and				
Grizles	1	13	0	" " " "
Facing Stocks	2	12	0	" " " "
Shippers	2	10	0	" " " "
Flettons	1	10	0	" " at railway dep.
Red Wire Cuts	1	13	0	" " " "
Best Farnham Red	3	12	0	" " " "
Best Red Pressed				
Buabon Facing	5	0	0	" " " "
Best Blue Pressed				
Staffordshire	4	4	0	" " " "
Do. Bullnose	4	10	0	" " " "
Best Stourbridge				
Fire Bricks	4	8	0	" " " "
GLAZED BRICKS.				
Best White and				
Ivory Glazed				
Stretchers	13	0	0	" " " "
Headers	12	0	0	" " " "
Quoins, Bullnose				
and Flats	17	0	0	" " " "
Double Stretchers	19	0	0	" " " "
Double Headers	16	0	0	" " " "
One Side and two				
Ends	19	0	0	" " " "
Two Sides and				
on End	20	0	0	" " " "
Splays, Cham-				
ferred, Squints	20	0	0	" " " "
Best Dipped Salt				
Glazed Stretch-				
ers and Headers	12	0	0	" " " "
Quoins, Bullnose				
and Flats	14	0	0	" " " "
Double Stretchers	15	0	0	" " " "
Double Headers	14	0	0	" " " "
One Side and two				
Ends	15	0	0	" " " "
Two Sides and				
on End	15	0	0	" " " "
Splays, Cham-				
ferred, Squints	14	0	0	" " " "
Second Quality				
White				
Dipped Salt				
Glazed	2	0	0	" " less than be

BRICKS, &c. (continued).

Table listing various brick and tile products with prices per yard or per ton, including items like Portland Cement and Blue Lias Lime.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

roy Stouo Lime.....12s. 0d. per yard, delivered.
fourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

Table listing stone products such as Portland Cement, Blue Lias Lime, and various types of stone blocks with prices per cubic foot.

Table listing stone products including Ancaster in blocks, Greenhill, Darley Dale in blocks, and Red Cornish.

Table listing stone products including York Stone—Robin Hood Quality, capped random blocks, and various sizes of stone blocks.

Table listing stone products including Haro York—capped random blocks, and various sizes of stone blocks and slabs.

SLATES.

Table listing slate products with prices per 1000, including items like blue Bangor and various sizes of slates.

TILES.

Table listing tile products with prices per 1000, including plain red roofing tiles, Hip and Valley tiles, and various decorative tiles.

WOOD (continued).

Table listing wood products with prices per standard, including Fir timber, Second yellow deals, and various sizes of wood.

WOOD (continued).

Table listing wood products with prices per load of 50 ft., including Fir timber, Second yellow deals, and various sizes of wood.

JOINERS' WOOD.

Table listing joiners' wood products with prices per standard, including White Sea, first yellow deals, and various sizes of wood.

Table listing joiners' wood products including Potersburg, first yellow deals, and various sizes of wood.

Table listing joiners' wood products including White Sea and Petersburg, first white deals, and various sizes of wood.

Table listing joiners' wood products including Pitch-pine deals, Under 2 in. thick extra, and various sizes of wood.

Table listing joiners' wood products including Yellow Pine—First, regular sizes, and various sizes of wood.

Table listing joiners' wood products including Exari Pine—Planks, per ft. cub., and various sizes of wood.

Table listing joiners' wood products including Dry Walnut, American, per ft. sup., and various sizes of wood.

Table listing joiners' wood products including Teak, per load or V-jointed lads, and various sizes of wood.

LEAD, &c.

Table listing lead and other metal products with prices per ton in London, including Lead—Sheet, English, 3lb. and up, and various types of pipes.

Table listing English Sheet Glass in Crates with prices per ft. delivered, including 15 oz. thirds, 21 oz. thirds, and various sizes.

Table listing Oil &c. products with prices per gallon, including Raw Linseed Oil in pipes and various types of oil.

Table listing Varnishes with prices per gallon, including Fine Pale Oak Varnish, Pale Copal Oak, and various types of varnish.

Table listing Terms of Subscription with details on how to subscribe to The Builder, including rates for London and other locations.

Table listing Tenders with details on how to submit tenders for building work, including communication instructions.

Table listing Metals with prices per ton in London, including Rolled Steel Joists, Compound Girders, and various types of metal.

Table listing Metals (continued) with prices per ton in London, including Sheet Iron, Galvanized Sheet, and various types of metal.

COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered.
*Municipal Offices and County Court	Bromley Borough Council	Not stated	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Electric Lighting, Springburn District Library	Glasgow Corporation	W. B. White, Architect, 219, St. Vincent-street, Glasgow	Aug. 12
Heating & Ventilating, Springburn District Library	do.	do.	do.
Fifteen Cottages, Walls, Outhouses, etc.	Tantobie Co-operative Society	W. Hall, Secretary, Society's Offices	Aug. 15
2 Villa Resids, Willow Field Est., Rochdale-rd., Halifax	Halifax Highways Committee	T. Kershaw, Architect, L. and Y. Bank-chambers, Halifax	do.
Improvement Works, Emscot-grove, etc.	Wakefield Light Railway Co.	J. Lord, C.E. Borough Engineer, Town Hall, Halifax	do.
Stones	Salc & Ashton Sub-Com. for Educa.	H. England, Belle Isle, Wakefield	do.
Council School, Sale	Plymouth Education Authority	E. J. Thompson & Son, Architects, 19, Dickinson-st., Manchester	do.
Backing, Heating, etc., Laundry, Cardiff Infirmary	Preston Guardians	M. H. Sykes, Borough Engineer, Town Hall, Stockton-on-Tees	do.
Street Improvement Works	Farnworth U.D.C.	H. J. Snell, Architect, 11, The Crescent, Plymouth	do.
Electric Light Installation, Technical School	Bengal & N.W.Ry. Co., Ltd.	Mr. Whitwell, Clerk of Works, Fulwood Workhouse, Preston	do.
1,300 yds. of Cast-Iron Water Mains, etc.	do.	J. D. Penber, Electrical Engineer, Electricity Works, Farnworth	do.
Weightbridge at Electricity Works	do.	Handwood & Harrison, Architects, Acrrington	do.
Two Lancashire Steam Boilers, Wesham Workhouse	do.	A. Izat, 237, Gresham House, Old Broad-street, E.C.	do.
Sixty-one Spans of 40 ft.	do.	do.	do.
Forty-seven Spans of 20 ft.	do.	do.	do.
Outfall Sewer, Tanks, etc., Millisle	Walshall Corporation	J. Russell, C.E., 22, Waring-street, Belfast	do.
Stable, Harness Run, etc., Tramway Depot, Birchills	Urban District Council	F. H. Livesay, Architect, Bishop Auckland	do.
Alterations, West Auckland Workmen's Club	Centenary Congregational Church	C. Heslop, Surveyor, Shildon, Durham	do.
Roadworks, East-parade, Shildon	Mr. E. Cuthbert	C. B. Pearson, Architect, 12A, Cheapside, Lancaster	do.
Mission Hall, Boverham, Lancaster	Branley Guardians	C. S. Nelson, Architect, Sun-buildings, 15, Park-road, Leeds	Aug. 16
Rebuilding Shop, 178, High-street, Dowdals	do.	do.	do.
House, Llantarnam	Secretary of State for India	Director-General of Stores, India Office, Whitehall, S.W.	do.
Extension of Boiler House at Workhouse	Rotherham Education Committee	J. Platts, Architect, High-street, Rotherham	do.
Alterations to Administrative Block, for Nurses' Home	do.	do.	do.
Plate Girder Spans	Automatic Standard Screw Co.	W. C. Reid, Architect, Elgin	Aug. 17
Alteration to Out-Office at Ferham Council School	Stockport Gas, etc., Committee	Jackson & Fox, Architects, Rawson-street, Halifax	do.
Alterations at St. Ann's Boys' School, Rotherham	Salford Gas Committee	S. Meunier & Gasworks, Portwood, Stockport	do.
Headquarters, 3rd V.B. Seaforth Highlanders	Joint Committee of Management	W. W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	Aug. 18
Alterations to Works in Charles-street, Halifax	Tipton U.D.C.	J. F. Fuller, Architect, 179, Great Brunswick-street, Dublin	do.
Weldless Steel Tubes	Magherafelt Guardians	W. H. Jukes, Surveyor, Public Offices, Owen-street, Tipton	do.
500 Tons Oxide of Iron Purifying Material	Glasgow Corporation	R. S. Ansell, Architect, Draycot, near Derby	do.
Three Blocks of Buildings, Connell Lunatic Asylum	Newton Abbot U.D.C.	W. Hastings, Clerk, Board Room, Workhouse, Magherafelt	do.
Manholes & C.I. Pipe Sewers under Birmingham Canal	Richmond (Yorks) Corporation	S. Shaw, F.R.I.B.A., Architect, Kendal	do.
Completion of Council Schools, Draycot	Dudley Guardians	Office of Public Works, City-chambers, High-street, Merthyr	do.
Fifty-four cwt. of Fowler's Calcium Carbide	Admiralty	J. Blair, Boat Builder, Flindochy	do.
Enlarging Ladies' College, Arnside, near Kendal	Down County Council	E. G. Coslett, Architect, Dudley	do.
Underground Convenience, Mitchell-street	do.	Superintending Civil Engineer, H.M. Breakwater, Portland	do.
Workmen's Hall, etc., New Tredgar	Runcorea R.D.C.	J. Heron, County Surveyor, Court House, Downpatrick	Aug. 20
Making-up and Paying Deoxy-road	do.	do.	do.
Alliott & Patons Washington Lyons Disinfecter	Bedford R.D.C.	G. E. Bolshaw, Architect, 189, Lord-street, Southport	do.
Relaying Pipe Sewer	do.	R. Curran & Son, Architects, Cairo-street, Warrington	do.
Hall, Finchley	do.	do.	do.
Cleaning, Painting, etc., Union Offices, St. James-rd.	Halifax Guardians	District Surveyor, Bedford	do.
*New Coastal Bldgs., Essex Hill, Alderney, Chan. Isl.	G.N.Ry. Co., Ltd.	Rev. W. J. Harkness, Vicar, Hanslope	do.
*Add. Coastal Buildings at Whitehlands, nr. Senton	Colchester Guardians	C. Morgan Davies, Architect, High-street, Merthyr	do.
Repair of Sea Wall and Apron, etc., Killeith	Chipping Campden R.D.C.	W. Clement Williams, Architects, 29, Southgate, Halifax	Aug. 22
Repair of Walls, etc., Millquater Bay	do.	W. H. Mills, Engineer, Amiens-street Terraces, Dublin	do.
Small Sewage Disposal Works, Dutton, Preston Brook	Walsend Corporation	G. H. Page, Architect, Trinity-chambers, Colchester	do.
New Wing, etc., St. Anne's Mon., Sutton, St. Helen's	Andover Corporation	B. J. Wolfenden, Borough Engineer, Beotle	do.
Church, Thatto Heath, St. Helen's	Stockport Guardians	Wilcox & Baines, Engs., Tulse-chambers, 83, Temple-row, Birmingham	do.
Cartage of Road Material	Andover Corporation	do.	do.
Repair of South Aisle, Hanslope Church	Glasgow Corporation	G. Hollings, Borough Surveyor, Corporation Offices, Walsend	do.
Repairing Nine Houses at Beaulieu	Yearsley-cum-Whaley U.D.C.	Borough Surveyor's Office, Town Hall, Andover	do.
Furnishing Board Room at Workhouse	do.	Borough Surveyor's Office, Town Hall, Andover	do.
Goods Store of Timber, with iron Roof, Moira Stran	Derwent Valley Water Board	A. Wilson, 45, John-street, Glasgow	Aug. 23
Masonry Gatehouse, Newdownwell Level Crossing	do.	C. R. Brady, Engineer, 13, Warren-street, Stockport	do.
Board Room, Maniement Room, etc., at Workhouse	do.	do.	do.
Alterations, etc., Electric Light Offices, Pine-grove	do.	do.	do.
2,900 yds. of 4-in. Cast-Iron Pipes	do.	do.	do.
5,500 yds. of 3-in. Cast-Iron Pipes	do.	do.	do.
Cementing of Footpaths, Atkinson-terrace, etc.	do.	do.	do.
Street Works	do.	do.	do.
Gas Mains and Services, Stepping Hill New Infirmary	do.	do.	do.
208 Tons of Macadam	do.	do.	do.
Gas Meters	do.	do.	do.
Demolition, Old Bridge over Goyt, Bridge-st., Whaley	do.	do.	do.
Rebuilding Bridges over the Goyt, Whaley Bridge	do.	do.	do.
Steelwork for Bridge over the Goyt	do.	do.	do.
Valve (Contract No. 2), Derwent Aqueduct	do.	do.	do.
*Fireproof Floor to Switch-board Gallery	do.	do.	do.
Plastering Walls, Technical School, Tavistock-road	do.	do.	do.
Making-up Walton-road and Herbert-road	do.	do.	do.
300 Tons of 3-in. Limestone Road Metalling	do.	do.	do.
250 Tons of 14-in. Limestone Road Metalling	do.	do.	do.
Fifty Tons of Chippings	do.	do.	do.
*Erect. of New Veg. Kitchen, etc., Redfern-rd., Whiske	Lambeth Guardians	Guardians' Offices, Brook-street, Kennington-road, S.E.	do.
*Isolation Cottage at Manston	Helmley R.D.C.	R. A. Harris, 3, Cecil-square, Margate	do.
Waterworks, Ampleforth	do.	E. J. Silcock, Engineer, 10, Park-road, Leeds	Aug. 25
Rebuilding "Three Generals," Aberdare	do.	T. Roderic, Architect, Clifton-street, Aberdare	do.
Making Good After Fire, No. 25, Carlisle-st., Aberdare	do.	do.	do.
Clearing Site, etc., for Dwellings	do.	do.	do.
Eighty-nine Habitations, Cross-avenue, North	do.	do.	do.
*Drain & Sanita. Wks., Fulbourne Asyl., nr. Cambridge	Kingstown U.D.C.	M. A. Manning, Town Hall, Kingstown	do.
Laboratory and Classroom, Rugeley Grammar School	Visitors, Camb., etc., Lunatic Asyl.	A. P. MacAllister, 20, St. Andrew's-street, Cambridge	Aug. 26
Murton Drainage	The Governors	W. E. Rogers, Architect, Rugeley	Aug. 27
Brick & Concrete-covered Service Tank (15,000 galls.)	Milton (Kent) R.D.C.	W. Leonard Grant, Sittingbourne	do.
Collecting Wells, Tarners Lodge	Fairfield (Derbyshire) U.D.C.	Swann & Brady, Engineers, Town Hall, Chapel-on-le-Frith	Aug. 29
1,000 Head yds. of 3-in. Cast-Iron Pipes	do.	do.	do.
Alterations, etc., Distington Council School	Cumberland Education Committee	Clerk of Works, The Courts, Carlisle	do.
Two Villas, Purdysburn	Belfast Asylum Committee	A. Ferguson, Surveyor, Scottish Provident-buildings, Belfast	do.
Steel Coal Bunkers	Ilford U.D.C.	A. H. Shaw, M.I.E.E., Electricity Works, Ilford	do.
Weightbridges	County Borough of West Ham	Borough Engineer, Town Hall, Stratford, E.	do.
*Erection of Library, Prince Regent's-Is., Custom House	Stanley U.D.C.	J. Routledge, Surveyor Council Offices, Stanley	Aug. 30
Street Works	Hove Corporation	Handcock & Dykes, Engineers, 1, Victoria-st., Westminster, S.W.	do.
Low Tension Mains, Conduits, etc.	Bacup Corporation	Borough Surveyor, Bacup, Lanc.	do.
Painting Police Buildings	do.	do.	do.
Painting Fire Station	do.	do.	do.
Painting St. James-street Property	do.	do.	do.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be delivered. Lists various construction projects and their respective contractors and tender dates.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Lists public appointments such as Assistant Engineer, Surveyor, and Clerk of Works.

Those marked with an asterisk (*) are advertised in this Number. Competitions, iv. Contracts, iv. vi. viii. x. Public Appointments, xvi. xvii.

TENDERS.—Continued from page 191.

ANSTEAD.—For a pair of villas at Banstead, Surrey, for Mr. A. Ware, and under the supervision of Arthur L. Dartnell, architect and surveyor, 62, High-street, Croydon.— Per house. J. James, Emlay Cottage, Gilfach, Bargoed* £220 0. T. Williams 215 0. L. Thomas 214 15.

HARROGATE.—For main drainage works in the parishes of Bilton and Killinghall for the Corporation. Mr. E. W. Dixon, Engineer, 5, Prospect-crescent, Harrogate.— Contract No. 5. Holme & King, Ltd., Liverpool .. £14,566 11 11.

CARNARVON.—For construction of bath and buildings on the Aber foreshore, for the Corporation. Mr. E. J. Borough Surveyor:—

Table with 3 columns: Bath, Buildings, Total. Lists costs for construction of bath and buildings in Carnarvon.

HARTFORD.—For broken granite:— Per ton. Croft Granite Co. 11 0. Enderby & Stonoy 11 0. Stanton 11 0.

HULL.—For the erection of the Law Courts portion of Town Hall, for the Kineston-upon-Hull Corporation. Messrs. S. E. Russell & T. E. Cooper, architects, 11, Gray's Inn-square, London, W.C. Quantities by Mr. J. Watson, Cogan-chambers, Bowlsalley-lane, Hull.— Quibell, Son, & Greenwood, Ltd., Fountain-road, Hull* £31,212 15.

CATERHAM.—For a pair of villas at Caterham, Surrey, for Mr. William Sandiford, and under the supervision of Mr. Arthur L. Dartnell, architect and surveyor, 62, High-street, Croydon.—

DUNFERMLINE.—For a main conduit between Glen-devon and Milesmark, for the District Committee of the Fife County Council. Mr. W. R. Copland, C.E., Glasgow:— Casey & Darragh, Stirling* £22,091 18 8.

IVYBRIDGE.—For widening Blackford-road and constructing a footpath, for the Urban District Council. Mr. W. R. Parker, Surveyor to Council, Ivybridge:— Laphorn £238 1 6. Jofford & Sons, Devonport* .. £205 0 0. G. B. Andrews 232 0 0.

LEEDS.—For painting, etc., the dead meat market, for the Corporation:— L. Cook, Shepherd's-lane, Leeds .. £338 8 6.

LEWIS.—For building an infectious diseases hospital at Letwiche, near Northwich, for the Northwich Rural and Northwich, Middlewich, and Winsford Urban Hospital Committee. Mr. J. Cawley, architect, Central-chambers, Northwich:— Birchall Bros., Middlewich* £6,540 13 6.

LIVERPOOL.—For erecting a new sorting office at Old Swan, Liverpool, for the Commissioners of H.M. Works and Public Buildings:— Bullen Bros. & Son £1,376 0 0. A. White & Sons 1,225 5 4. J. & T. Rimmer 1,141 0 0. S. Fowler, 1,123 0 0. J. Esterson & Son 1,118 0 0.

LYBBY.—For alterations and additions to children's living home, Nos. 2 and 4, Mount-street, for the Guardians. Mr. F. C. Coulhurst, architect, 4 Albert-st., Derby:— J. Young, Wallbrook-road, Derby* £240 4 0.

EXETER.—For sub-structure of car depot, Heavitree-road, for the Corporation. Mr. T. Moulding, City Engineer and Surveyor, 7, Southernhay West, Exeter:— W. E. Blake, Sutton Building Yard, Plymouth* £1,130.

GORTON.—For erecting a temporary school for 600 children, Hyde-road, for the Education Committee. Mr. J. W. Wilks, Surveyor, Town Hall, Gorton:— Young, Tinker, & Young, Manchester* £1,767.

LONDON.—For alterations to ice wells, etc., at New Wind-road, King's Cross, N., for Messrs. Carlo Gatti, Stevenson, & Slater Ltd., Mr. H. Phelps Draw, architect, 33, King-street, Covent Garden, W.C. Quantities by Mr. L. Rookwood, 25, Bedford-row, W.C. :—
 Ashby & Horner .. £1,880 Norton .. £1,487
 Wilkinson .. 1,560 Edwards & Medway* 1,470

LONDON.—For alterations to 39, Pavilion-road, Chelsea, S.W., for Mr. Albert Cooper. Mr. H. Phelps Draw, architect, 33, King-street, Covent Garden, W.C. :—
 Crabtree .. £456 Bolton* .. £388
 Parkinson .. 401

LONDON.—For conversion of Infants' block at Norwood Schools into a receiving ward, for the Lambeth Guardians. Mr. S. E. J. Smith, architect, 15, York-buildings, Adelphi, W.C. :—

		Time for completion.
		Weeks.
Stimpson & Co	£937 0 0	10
J. Parsons	887 0 0	8
Marlin, Wells, & Co.	886 0 0	14
G. Jennings Ltd.	850 0 0	10
B. E. Nightingale	828 0 0	7
W. Mark & Co., Ltd.	826 4 2	6
C. B. Price	809 14 6	9
H. Kent, 17, Albion-road, Lewisham*	775 10 0	12
J. Shelbourne & Co.	780 0 0	13

† Any reasonable time.

LONDON.—For internal painting and decorating of Council Chamber, Committee Rooms, etc., at Hackney Town Hall, Mare-street, N.E., for the Hackney Borough Council. Mr. Norman Scorgie, M.Inst.C.E., Borough Engineer and Surveyor :—

Dawson, Swainston, & Co.	£527 4 7	F. Troy & Co. £206 12 0	P. McCarthy 276 0 0
C. Castle & Son	470 0 11	J. Johnson .. 252 13 11	H. Gent .. 250 19 8
A. Heard & Co.	426 8 4	R. W. Harvie 247 13 6½	W. Wallace & Co., Ltd. .. 245 11 0
H. Runham Brown	404 2 2	J. Kirkaldy & Son .. 240 3 6	R. Woollasten & Co. 239 0 0
Wontner & Co., Ltd.	401 17 7	Spencer, Sauter, & Co., Ltd. 235 6 4	B. E. Nightingale .. 235 5 11
G. Wales & Co., Ltd.	383 16 2	J. M. Bookbinder .. 343 15 0	Campbell & Christmas .. 235 0 0
M. McCarthy Langdon & Clark	351 4 1	C. J. Kemp 336 0 0	F. de Jong & Co. 232 8 4
J. M. Bookbinder	343 15 0	Chudleigh Treas. 328 5 0	Campbell, Smith, & Co. 231 6 1
H. Dearsley & Son	320 10 1	H. Dearsley & Son .. 320 10 1	Gavin Bros. 184 4 0
W. Whiteley, Ltd.	310 6 5	S. Gorcz & Son	R. Athey .. 167 16 1
S. Gorcz & Son	298 5 3		

LONDON.—For erecting premises, Stratford, for Messrs. Williams & Thomas. Messrs. G. Baines & Son, architects, Clements-lane, Strand, W.C. :—

Sherrin & Sons, Ltd.	£7,983	Bulman & Pothier ..	£6,177
T. H. Kingerlee & Sons	7,177	G. J. Hosking ..	5,999
F. Gough & Co.	6,494	W. H. Higgs ..	5,947
Conson & Lotts ..	6,307	Battley, Sons, & Co.	5,797
H. L. Holloway ..	6,190	Holness	5,797
J. Grover & Son ..	6,182	C. North, Grove Works, Manby, N.L., Stratford, E.†	5,620
Kerridge & Shaw ..	6,177		

† Accepted with modifications.

B. NOWELL & Co.,
 Stone Merchants & Contractors.
 Chief Office, —Harwick Road, KENSINGTON.
 Norway, Guernsey, and Leicestershire Granite, Kerb, Pitching, and Yorkshire Stone.
 ESTIMATES GIVEN FOR EVERY DESCRIPTION OF ROAD MAKING.

LONDON.—For erecting houses, Lakeside-road, Palmer's Green. Messrs. Warren & Stupart, architects, 78, Grand-parade, Haringbury, N. :—
 W. Lawrence & Son

PORTSMOUTH.—For alterations and additions to The Empire Palace of Varieties, Portsmouth, section 2. Mr. W. H. Fry, architect, Gosport. Quantities by the architect :—
 F. Cake, Southsea* .. £3,900

SOUTHAMPTON.—For rebuilding Nos. 43 and 45, Above Bar, Southampton, for the Hampshire Advertiser Printing and Publishing Co., Ltd. Mr. William Burrough Hill, F.S.I., architect, Southampton :—
 J. Nichols

TIPTON.—For repairs to buildings, playground, etc., at Bloomfield Council School, for the Urban District Council. Mr. A. Long, architect, 21, New-street, West Bromwich :—
 J. Hunt

WIMBLEDON.—For making-up roads, for the Urban District Council. Mr. G. H. Cooper, Engineer and Surveyor, Council Offices, Broadway, Wimbledon :—
 Birbeck-road : Fry Bros., Lion Wharf, Greenwich

WOBURN, BEDS.—For alterations to manager's house at the Woburn Gas Works, for the Directors of the Gas Co. Mr. W. B. Stonebridge, architect, Woburn, Beds. :—
 H. Gregory

WORSLEY.—For repaving Manchester-road, for the Urban District Council. Mr. J. A. Corson, Surveyor to the Urban District Council :—
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The Report of the Committee on the Chantrey Trust.



THE Chantrey Trust Committee have issued their Report with commendable punctuality, and the Report itself is characterised by an equally commendable brevity, precision, and moderation of language.

In regard to the quality of the works already purchased under the Trust, the Report refers to the evidence of various witnesses to the effect that “while containing some fine works of art, the collection is lacking in variety and interest, and while failing to give expression to much of the finest artistic feeling of its period, it includes not a few works of minor importance.” The Report continues—“Full consideration of the evidence has led the Committee to regard this view as approximately correct. The collection, in their opinion, contains too many pictures of a purely popular character, and too few which reach the degree of distinction evidently aimed at by Sir Francis Chautrey.” It is in the latter sentence especially that the true state of the case has been hit. It is hardly correct to say that the collection is wanting in “variety”; there is quite as much variety, in regard to class of subject at all events, as could be reasonably expected. But it is perfectly true that a considerable number of the pictures belong to what may be classified

as “popular” pictures; the kind of works which please the ordinary exhibition crowd, and are reproduced in the popular illustrated papers. It is amusing to notice in the evidence that the painter of one of these popular pictures—a pretty but conventional *genre* work which has no claim to be in such a collection, declared (according to the report in the *Times*) that the Chantrey pictures formed “the best collection of modern art of its size that existed”; an optimistic estimate in which we fear we will not find many supporters; although, as we have said on a previous occasion, the sweeping condemnation of some of the critics on the subject is equally exaggerated. The collection includes some really fine works, amid a good deal of mediocrity.

Both the Report and the evidence* seem to show a curious uncertainty and difference of opinion as to Chantrey's object in the bequest, which appears to us to be perfectly clear from its very terms. He wished to encourage British art and to stimulate the production of the highest class of work, by providing artists with a fair chance of purchase for works of the highest class, which would be out of the run of popular estimation or comprehension. The works purchased were to be preserved as a collection, no doubt; but the formation of a Gallery was only a secondary object; the primary object was to stimulate and promote the highest class of artistic production. We cannot understand how any clear-headed person could read the terms of the

* The evidence has not yet been officially published, but it was reported pretty fully, and we have no doubt in the main correctly, in the *Times*.

bequest without recognising this as its object. The suggestion in the Report (clause 12), that “a greater flexibility of method” in finding and selecting pictures might be attained, among other means, “by purchase from private owners, or even occasionally at auction from dealers,” appears to us to be quite at variance with the terms and intentions of the bequest, which aimed at the direct and immediate reward of the artist himself, and not at paying a dealer's commission; and it is much to be regretted that such a suggestion should have been allowed to stand in the Report: it is directly subversive of Chantrey's obvious intentions. There is another recommendation in the Report for which more may be said, but which we think very doubtful; that is (clause 17), that “some modification should be effected in the provision of the will which forbids the purchase of incomplete works of sculpture.” What is really intended by this is that the Trust should be empowered to give commissions for the execution in a monumental material of works in plaster or terra-cotta which showed exceptional excellence. The word “incomplete” is ill-chosen to express the meaning, for it is obvious that the work, before it could be approved and commissioned, must be complete in modelling, although in a perishable material. It is quite true that the requirement of the execution of a work in marble or bronze, before it can be purchased by the Trust, puts a heavy burden on the sculptor who has to go to the expense of these materials on the chance or hope of being selected;

but it should be remembered that Chantrey was himself a sculptor, and therefore knew all about a sculptor's difficulties; that he may have specially intended to promote or encourage the execution of sculpture in monumental materials; and, moreover, that he emphasised in his will the fact that considerations of benevolence or of helping struggling artists were to be taken into no account whatever in the administration of the Trust. This recommendation therefore we consider to be a contravention of Chantrey's intentions in an important matter, and we must regret that it has been made.

Apart from these points, everyone (outside the Royal Academy) will probably agree with the conclusion of the Committee that "too exclusive a preference has been given to pictures shown at the annual Exhibition of the Royal Academy," and also that "any purchases of works by deceased artists should only be made in exceptional circumstances, and with great caution." We have some doubt whether they should be made at all, considering that the manifest object of the bequest was to encourage good art among living artists, and not to form a gallery of the works of deceased artists; but at all events we are glad that it is discouraged.

The main and important conclusion of the Report is to the effect that the constitution of the purchasing body, as appointed by the testator, is inherently defective; that a committee of ten artists, actively engaged in the practice of their art*, cannot give the requisite time or attention to the search for the particular three or four works of art which it is possible to purchase in any given year. We fancy that this has really been a good deal at the root of the system of purchase from the walls of the Academy; the largest annual collection of paintings and sculpture is there to their hands, and selection from that source saves time and trouble. The proposal of the Special Committee is that a Selection Committee of three be appointed, to consist of the President of the Royal Academy *ex officio*, of a Royal Academician appointed by the Council, and of an Associate appointed by the body of Associates; the members to hold office for five years, and not to be immediately eligible for re-election. It is very likely that this smaller body will be able to give better and more systematic attention to the subject than the more numerous one originally constituted; but the real advantage of the inquiry lies in the fact that it has formalised the conclusion that the public, or that portion of it which takes a serious interest in art, is decidedly dissatisfied with the way in which the Trust has hitherto been administered; and that is a fact which, when thus emphasised, cannot be without influence on its administration in the future.

NEW HALL, WALLSEND. The Victoria Memorial Parish Hall, which has been erected in connexion with St. Peter's Parish Church, Wallsend, was recently opened. The premises have been erected from the plans of Mr. E. F. Simpson, architect, at a cost of 2,400.

* The words of the Report are, "in the exercise of their Profession," which is not a happy expression. Art is not a "Profession."

NEW IRRIGATION PROJECTS FOR EGYPT AND THE SOUDAN.

MAKING no pause in their efforts, the rulers of Egypt continue the execution of works for the more complete utilisation of the water already furnished by the Nile and the consideration of means for the more complete engineering control of that great river. The national reservoir at Assouan, the regulating weirs at Assiout, Cairo, Zifta, and similar works on the great irrigation canals stand prominently forth as evidence of what has been accomplished.

Equally important, though less noticeable to the casual observer, are the construction and improvement of canal and drainage systems, the conversion of lands from basin to perennial irrigation, and the reclamation of large areas in different parts of the country. We need not refer further to the important constructional works here indicated, or to the inestimable administrative services of the Irrigation Department. These have been fully discussed in previous articles, and our intention now is to consider the future requirements of Egypt and the Soudan.

For the present no monumental works are required, with the solitary exception of adequate provision in Egypt proper for the escape of surplus waters during years of unusually high flood. Thanks to the magnificent work done in the past, Egypt is reasonably assured against agricultural disaster, but much remains to be done before the full benefits of the recently-completed works at Assouan and Assiout can be experienced.

Money has still to be provided for converting the lands of Middle Egypt from basin to perennial irrigation. Fully 600,000*l.* is being spent yearly upon new irrigation works for the more efficient distribution and utilisation of the existing water supplies, and at least 1,000,000*l.* will have to be spent in a similar manner during future years before the full benefit of the works at Assouan and Assiout can be attained.

Hence it is abundantly evident that progress is by no means at a standstill. Nevertheless, the demand for cultivated land is becoming more and more pronounced, and, as the increase of the cultivated area is necessarily attended with a corresponding increase of revenue, the Egyptian Government has very wisely taken steps to ascertain the means by which may best be obtained the further water supplies necessary for rendering additional areas of land available for the purpose of agriculture.

Comparatively little has been heard of the measures in question, which are now brought prominently to the notice of the public by the recent Report* of the Under-Secretary of State for Public Works in Egypt. With the exception of a brief despatch by Lord Cromer, the voluminous Blue-book published last week is devoted to a description of the investigations undertaken by Sir William Garstin. The Report embodies the results of observations made during five consecutive years on the Upper Nile, and presents some general conclusions regarding

future schemes in connexion with improvement of the White Nile, together with an account by Mr. C. Dupuis, of Egyptian Irrigation Department, relative to his expedition to Lake Tsana and the rivers of the Eastern Soudan.

In a previous Report, made in 1901, irrigation projects for the Upper Nile Sir William Garstin made no definite proposals, but merely indicated the directions which might advantageously be taken by further inquiries. Since that year has made an extended tour in the districts of the Upper Nile, with the result that much valuable information has been acquired as to the respective discharges of the river throughout the year. In the present volume, as the author says, is no sense of the word intended to be a record of travel. It is a purely technical report written for the purpose of presenting information regarding the Nile basin in a convenient form, and with a view to the object of assisting the comprehension of the various problems connected with the hydrography of the river.

Nevertheless, a large part of the Report is descriptive, and includes voluminous notes upon the lake area at the head of the White Nile, on the great lakes themselves, and on the various channels of the river Nile. This part of Sir William Garstin's work is full of the greatest interest, and an invaluable record of facts which may inevitably form the basis of all future schemes for the further utilisation of the Nile.

Considering the gigantic nature of the task undertaken, it is by no means surprising that many points still require elucidation, and that more complete information is essential before accurate data will become available for the definite guidance of the engineers who will ultimately have to deal with the stupendous problem of controlling the Nile from its sources to the sea. At the same time we find in the Report sufficient indication as to the general conditions which have to be taken into account, and ample evidence that the author has fully appreciated the correct method of dealing with the work lying before the Egyptian Government.

Very considerable are the difficulties connected with exploration in the immense regions through which the Nile passes. Little more than five years have elapsed since the Upper Nile valley was reopened to travellers. The clearance of "snags" in the Bahr-el-Gebel, although commenced, has not been entirely completed, and, as a matter of fact, it was not possible to send expeditions to the sources of the Blue and the White Nile until the end of the year 1902.

Moreover, it must be remembered that until the Nile reservoir works were completed, the Government was scarcely justified in embarking upon other extensive irrigation schemes such as those which are now under examination.

Now that the Assouan reservoir and other works in Egypt are in operation, Sir William Garstin feels himself free to suggest fresh projects for the improvement of the Nile supply, based upon the experience gained and observations made during recent years. He also makes proposals for the formation of a regular organised Irrigation Service in the Soudan, so that the study of the riv-

* Despatch from His Majesty's Agent and Consul-General at Cairo, including a Report by Sir William Garstin, G.C.M.G., Under-Secretary of State for Public Works in Egypt upon the Basin of the Upper Nile, Egypt, No. 2 (1904). London: Eyre and Spottiswoode.



Fig. 1.

may be continued and the different projects be presented to the Government of Egypt in a complete and well-considered form. The problems to be investigated, as Sir William Garstin states, "have two main objects—namely, that of increasing the water supply of Egypt in the summer and that of securing similar advantages to the Soudan during the same period." Although both ends are of equal importance, the former is certainly more likely to be immediately remunerative.

From the information contained in the present Report, it appears probable that the most satisfactory way of securing the desired results would be to reserve the waters of the Blue Nile for the improvement of the regions bordering that river, and to utilise the waters of the White Nile for the supply of the areas of the Nile valley lying to the north of Khartoum. In discussing such projects, Sir William Garstin first deals with those in connexion with the White Nile. These are (1) the regulation of the great lakes, and (2) the prevention of the waste of water caused by the vast swamps through which the river passes in the upper portion of its course.

By reference to the plan and cross section in Fig. 1, it will be seen that there should be no great engineering difficulties in connexion with the construction of works for controlling the flow of water issuing from Lake Victoria Nyanza. In that portion of the Report descriptive of the outlet, it is stated that "the rock is a hard and compact diorite, and appears to be sound and suitable for such a work. The river could be turned through one of the openings, while the masonry in the others was in progress. When this portion of the work was completed the river could be passed through the sluices and the remaining opening similarly closed. To lower the reef would be rather more difficult, as it would not be so easy to manage the diversion of the stream, and a considerable amount of

blasting would be necessary in the channel below to ensure a clear outfall for the water. Still, even to this proceeding there would be no insuperable difficulties."

The construction of a regulator at the Ripon Falls would be a comparatively easy task, for the soundness of the rock and the width of the channel would permit the construction of foundations without any serious trouble. In his recent work on "The Nile Reservoir Dam at Assouan and After," Sir William Willcocks suggests that the best method of dealing with the Ripon Falls would be by cutting down the sill, building a suitable weir capable of holding 10 ft. of water, and drawing upon the immense amount of water annually stored in the lake. This suggestion, we are pleased to observe, meets with the entire approval of Sir William Garstin, who considers that, "should regulation of the Victoria Lake outfall ever be undertaken, the necessary works should be carried out upon these lines."

This huge natural reservoir would undoubtedly afford, even after deducting loss due to evaporation, more than sufficient water to meet the wants both of Egypt and the Soudan, and it is stated in the present Report that the necessary regulating works "would in all probability be far easier to construct than was either the dam at Assouan or the barrage at Assiout."

Turning now to Lake Albert, it is clear from information available that it would be perfectly easy to build a weir at the northern outlet. Sir William Garstin says that as the rock is at some distance below the bed of the river, the foundations of the work would have to descend to a considerable depth, but the chief difficulties to be contended with are those due to the remoteness of the locality and the absence of labour and supplies.

Thus the regulation of the two great equatorial lakes presents no insuperable difficulty, nor would the works involved be of any great size. They would, in fact, be regulating weirs of ordinary dimensions and not larger than many which have been built during recent years in Egypt.

In connexion with the utilisation of these two lakes, it should be remarked that as the Victoria Nile discharges its waters into the Albert Nyanza, this lake undoubtedly forms a great regulating reservoir. The two discharges of the Nile measured in March, 1903, one above its junction with Lake Albert and the other below the outfall, seem to prove that when the river and the lake are low, and their levels not far above the minimum, there is a very inappreciable increase in the volume escaping from the lake over that which enters it from the Victoria Nile.

It is stated, on the authority of Felkin, that in the dry season less water is brought into Lake Albert from the Victoria Nyanza, and the level of the lake sinks until the rainy season sets in and the usual current of water is brought in by the Victoria Nile. What the relations may be between the incoming and outgoing discharges during the rainy season the present Report does not suggest, and until a gauge has been erected on the lake, and results have been accumulated for some years, all theories on the subject

must be purely speculative. The fact remains, however, that the construction of regulating works at the outfalls of the two lakes would permit the storage and discharge of all the water required for the future needs of Egypt and the Soudan.

The great objection to any scheme for augmenting the discharge from the equatorial lakes is, as Sir William Garstin points out, that under present conditions the increased volume of water would never reach the White Nile, but would be entirely wasted in the marshes through which the Bahr-el-Gebel passes. This brings us to the second scheme in connexion with the control of the river.

The truth of this statement is made abundantly evident by the section of the report dealing with the discharge of that part of the river. The Bahr-el-Gebel, which extends from Lake Albert to Lake No, is 1,156 kilometres in length. It is shown that between Mongalla and Bor, in a distance of 133 kilometres only, the river loses 50 per cent. of its volume before entering the "Sudd" region at all. The reason for this evidently is that the flood water, instead of flowing forward, spreads out in all directions over marshes and lagoons, filling up a huge basin or natural reservoir in the river valley between Lado and Ghaba Shambé. Thus an enormous quantity of the water coming from the south is used up and never finds its way to the north at all, the effect upon the river being similar to that produced by filling the irrigation basins in Upper Egypt. The natural reservoir to which we now refer plays an important part in securing the constancy of supply in the Bahr-el-Gebel.

As the river falls much of the water stored must slowly return to the channel, although a large proportion of it is undoubtedly lost by evaporation. Still, enough remains to assist to no inconsiderable extent in keeping up the supply during the winter months.

The next point for consideration is the loss of water in the enormous marshes traversed by the Bahr-el-Gebel. These marshes commence at about 766 kilometres from Lake Albert, and continue without a break to the junction of the Bahr-el-Gebel with the White Nile at Lake No. The following table, compiled from data given in the Report, gives the discharges observed in the "Sudd" region during 1902 and 1903:—

DISCHARGE OF THE NILE IN THE "SUDD" REGION.

Distance from Lake Albert in kilometers.	Year.	Month.	Discharge in Meters Cube per second.
400 (Lado)	1902	September	1,079
400 "	1903	"	1,955
820 "	1903	"	582
820 "	1902	"	308
947 "	1903	April	331
943 "	1903	September	375
941 "	1903	"	429
1,003 "	1902	"	333
1,146 "	1903	April	285
1,147 "	1903	August	318
1,147 "	1903	September	315

Examination of the foregoing table will show that in 1902, which was a year of low flood, the river lost 64 per cent. of its volume in a distance of 420 kilometres from Lado, while in 1903, a year of very high flood, the loss in the same distance amounted to no less than 73 per cent. of the discharge passing Lado. Equally serious are the losses observable

that should be undertaken as soon as the preliminary investigations can be completed. The other project, involving the control of the Equatorial lakes in the former long since proposed by Sir William Willcocks, can afford to wait, and must necessarily wait, until the Bahregebels has been improved, so as to permit the establishment of an augmented discharge.

Next, we must briefly refer to the most interesting and able Report of Mr. Dupuis on Lake Tsana and the rivers of the Soudan. This portion of the Report will amply repay perusal, and we much regret that space will not permit us to discuss it at any length. The various beginning and fountain-head schemes for the improvement of the Blue Nile would be the utilisation of the Lake Tsana, were it not for political considerations. If this natural reservoir, with an available capacity of 3,000 million cubic metres, were not situated beside the Soudan, the construction of a regulator at the outlet of the Blue Nile would at once settle the question of the summer supplies for the river. As William Garstin says, however, that the questions involved by its position are so many and so difficult of adjustment that the abandonment of the project for an indefinite future appears to be a matter of certainty."

Hence the study of alternative projects is necessarily to be taken up. The following are the schemes requiring investigation in the order of their importance as stated in the Report:—

(1) The selection of a site for an open drainage near Wad Medani and the study of projects for main irrigation canals east and west of the river. (2) The possible construction of a dam at the head of the saires Rapids to supplement the winter supply of the Blue Nile. The reservoir would be filled during October and November and emptied during the months of December, January, and February. (3) The improvement of the regulation of the river Gash by the construction of a large circular basin near the apex of the delta of the river, for the distribution of the flood waters into canals through head regulators in the banks of the basin. (4) The construction of a dam and storage reservoir on the Atbara river. (5) Examination of the rivers Dinder and Kahad, with the object of deciding whether the construction of storage reservoirs would be practicable; and (6) Examination of the upper valley of the Atbara, with a similar object.

Of the projects mentioned in connexion with the Eastern Soudan, the most important are those for the control of the river Gash and the construction of the dam on the Blue Nile. The first of these is strongly recommended, as it does not involve any considerable expenditure, and would render fully 100,000 acres of land available for cultivation by the population already settled in the district. The second would be more costly and less remunerative, although its realisation must be attempted sooner or later.

It is satisfactory to learn that the study of all the problems for the development of irrigation in the Soudan is to be taken up by a regularly organised Department, under the direction of Sir William Garstin.

The Soudan at present represents an unknown quantity, but there is every reason for believing that its return to prosperity may be looked upon as a certainty, even if the work of development be somewhat slow. Brief and inadequate as the present review undoubtedly is, enough has been said to convey some idea of the momentous conceptions contained in the Report. The rescue of the Nile from the marshes, which take from it half its volume, the control of the giant headwaters of the river, and the regulation of the Blue Nile for the regeneration of the Soudan, are some of the tasks now seriously proposed. But even these do not exhaust the category of works set forth by Sir William Garstin, and we must defer to a succeeding article the further consideration of the monumental programme he has placed before the world.

NOTES.

THE premature death of Mr. Justice Wright, admittedly one of the ablest judges, is noticeable from the point of view of the Law of Light and Air. He may be said to be the real destroyer of the doctrine of the right of the owner of a dominant tenement to an extraordinary amount of light. In *Warren v. Brown* he gave a remarkable judgment exploding the doctrine. This decision was reversed by the Court of Appeal. But when the case of the Home and Colonial Stores *v.* Colls came before the House of Lords on the same subject the Lord Chancellor directly and admittedly adopted the reasoning of Mr. Justice Wright in *Warren v. Brown*, and so the great appellate decision in *Colls'* case is in many ways based actually on Mr. Justice Wright's previous judgment, which certainly threw so much light on the subject as largely to lead to the final declaration of the law.

THERE appears to be no doubt, from what transpired during the debates last week on the Education question, that many local authorities are dealing too easily with the managers of the Church schools in regard to the buildings. These buildings should have been handed over to the authorities in complete repair; on the contrary, they have in many cases been taken as they stand. There also seems to be some doubt if the sanitary arrangements of the elementary schools are being kept up to the mark, and assertions were made during the same debate that county authorities were inclined to overlook these defects. Nothing can be more important for the public health than that elementary school buildings should be kept up to a high standard, since children are massed in them at an age when they are susceptible to contagious diseases. That within ten years there will be few non-provided elementary schools left seems probable, but, as long as this class of schools exists, they should be kept up to the mark both in structure and in sanitation.

THE advent of British rule in Uganda is bringing many changes to countries that a few years ago were scarcely marked on the maps then available. In Uganda railways are

by no means the only evidence of constructional science, for the capital of that country now possesses a permanent and well-built cathedral, designed by the architect-missionary, who has instructed the inhabitants in brickmaking, carpentry, and other mechanical arts. The new cathedral is the first really noteworthy public building erected in the country. The walls and two rows of columns are of sun-baked bricks, while the foundations are of bricks burnt in a kiln. It would be scarcely correct to regard the roof as a permanent structure, for it is merely covered with thatching of long grass. But the reed-work forming the ceiling is described as being a remarkably fine piece of work, and the palm-stems serving as beams and rafters also appear to possess considerable interest. The building, which is capable of accommodating a congregation of 3,500 persons, includes three aisles and transepts, meeting below a central dome, a well-appointed chancel, and the usual adjuncts of a cathedral. In the consecration of the cathedral by Bishop Tucker, assisted by fifty European and native clergy, we find striking testimony to the advances being made in a country that has only been rescued from savagery within quite recent times.

THE extension of the Mall, as a processional road, through Spring-gardens into Charing Cross, involves the demolition, already begun, of some remaining buildings in Spring-gardens, and of the two houses at Charing Cross near Drummonds' banking-house. The latter mark the site of the Bull's Head tavern and of the next-door house where, at one Thomson's, Milton lodged for a while, as is mentioned in his "Life" by Philips. A drawn plan made in the interval 1734-48, and formerly belonging to the Westminster Bridge Commissioners, plots the sites we mention together with "Cromwell's Palace"—where is now the bank, and the "French Church" and the "Chapel" in "Spring Garden." The Chapel stands at the north-east corner of New-street in the line of the new road, and was originally founded by some French Huguenot refugees, *temp.* William III., on the west side of the passage—now a road—leading out of Cockspur-street into Spring-gardens. Having been consumed, with the adjoining Thatched House tavern, by a fire in 1726, it was rebuilt in 1731-2 by the Honourable Edward Southwell. The French church was subsequently replaced with the chapel erected at the corner of New-street as a chapel-of-ease to the parish church of St. Martin-in-the-Fields, and dedicated to St. Matthew. Some apprehension is felt that the statue of King Charles I. will also be removed from its time-honoured position upon the site of the Queen Eleanor Cross at Charing. It has remained there during a long period, and many changes have been made around it; we may, indeed, apply to it Pope's couplet:—

"I see, I see where two fair cities blend,
The ample bow, a new Whitehall ascend."

At the remoter end of the processional road the stone piers, lamp-standards, and railings of the fore-court of Buckingham Palace are being removed

for an enlargement of the enclosure, and for a reconstruction of the railings with their middle length in one straight line instead of in a series of stepped curves, and with two chief gateways, for one of which is being made a copy of the gates which formerly stood in the "Secretary's gateway."

James II.'s Statue, St. James's Park.

REPLYING to Mr. Pierpoint in the House of Commons last week, Lord Balcarras stated that the First Commissioner of Works does not intend to correct the inscription which has been cut in the renewed pedestal, as being probably contemporaneous with the statue. But is that so? The "Autobiography of Sir John Bramston," first printed for the Camden Society in 1845, contains an entry:—

"On New Year's Day Jan. 1688-7 a statue in brass was to be seen (placed the day before) in the yard at Whitehall made by Gibbons, at the charge of Toby Rustick [Tobias Rustat] of the present King, James the 2nd."

In his "New View of London," 1708, Hatton quotes the inscription (saying it is nearly worn out) thus:—"JACOBUS SECUNDUS DEI GRATIA ANGLIÆ, SCOTIÆ, FRANCIE, & HIBERNIÆ REX. FIDEI DEFENSOR, MDCLXXXVI." The later mistake of "JACOB," for "JACOBUS," was rectified some years ago, but somehow the mistake of "GRATIE," for "GRATIA," has crept in, whilst "ANNO" was inserted before the date. In the Soane Museum is a picture (1782) of the Privy Garden, by Wheatley and Mortimer, showing the statue in its original position before the east front of the Banqueting House, Whitehall, with a railing around it. In June, 1896, the bronze was cleaned, and then painted with a very thin solution of a chemical product invented by Professor Church for preserving the patina, and a large hole in a shoulder of the figure, decayed by rain-water, was stopped up. Fourteen months afterwards the statue was removed into the garden of Gwydyr House, Whitehall, where it remained until the erection of a stand for the Coronation procession of 1902.

This is the title of a paper read by Mr. W. D. Scott-Moncrieff at the annual meeting of the Incorporated Association of Municipal and County Engineers. No one can say that the title is lacking in boldness, but the sewage problem has been solved so often (in theory) that we turn to a new claim of solution with some fear that it may be as unwarranted as its precursors. Mr. Scott-Moncrieff is, however, so careful a student of the problem that his views are worthy of thorough consideration. In his recent paper he gives the results of experiments made in filtering sewage, the principal novelty being the control of the air supply. The filter was 6 ft. deep, and the tests showed that nearly the whole of the purification was effected in the upper 3 ft., whether the air supply was at the rate of eight or sixteen gallons of air per gallon of sewage per hour; in some cases an appreciable increase of purification was effected in the fourth foot of depth, but below this the filter was for practical purposes useless. Somewhat curiously, the test without any air-supply gave approxi-

mately the same results as the other tests, but as the filter was only in operation for twelve hours per day, the periods of rest afforded a fair amount of aeration. We need scarcely say that the filter was of the percolating or trickling type, and not a contact-bed. The tests were made at Staines with sewage pumped directly from the sewer through a strainer, and, although they were not exhaustive, they were sufficient to show the advantages of Mr. Scott-Moncrieff's apparatus for determining the best conditions for the purification of a given sewage, including the rate of flow, the depth of filter, and the quantity of air required.

It is now generally conceded that percolating filters give better results than contact-beds, but the difficulty of securing uniform distribution of the sewage over the filters has to some extent detracted from the utility of this method of purification. A new type of distributor has recently been tested on a large scale at Hanley, and the results are so satisfactory that it will soon be adopted for the whole of the sewage of that town. The peculiarity is that the distributor is driven by power, and the speed can, therefore, be regulated to give that rate of flow which is found to be the best for any given conditions. The experiments were made by Dr. George Reid and Mr. J. E. Wilcox, A.M.Inst.C.E., and the results were given by them in short papers read at the recent Congress of the Sanitary Institute in Glasgow. Two filters were constructed, one circular and the other rectangular, each having an area of a quarter of an acre. The distributor for the circular filter was designed by Mr. Scott-Moncrieff and the other by Mr. Wilcox. In each case the degree of purification effected by treatment in an open septic tank and subsequent filtration at the rate of 200 gallons per square yard for the circular filter, and from 100 to 230 for the other, varied from 91 to 97 per cent. The filters were 4 ft. 6 in. deep, and were divided into sections containing material (crushed "saggars") of different sizes; the best results were obtained with the smallest pieces, namely, 3-16 in. to $\frac{1}{4}$ in. The experiments certainly show that power-driven distributors are worthy of an extended trial. If the cost of installation and the working expenses are not excessive, they will probably be the means by which the principal objection to the filtration of sewage is overcome.

We have received from the Engineering Standards Committee an interim Report with reference to British Standards for Electrical Machinery. We are asked, in view of the "very great importance" of these recommendations, to give them as much publicity as possible. The Sub-Committee on Generators, Motors, and Transformers, who have drawn up the Report, mention that they have decided to confine themselves to such points as would ensure uniformity in "nomenclature, outputs, and test conditions." Some of the recommendations as to pressures and frequencies have already been published, and the others seem to have been adopted by finding out the pressures most commonly employed in this country. It may be

worth mentioning that the standard pressures, for alternating current transformer work, which are recommended are 115, 230, and 460. It seems to be curious that these numbers are chosen instead of 110, 220, and 440, which are the numbers given for alternating current work. Before consulting engineers adopt these recommendations they certainly want to know why these numbers are adopted. Again, under the heading of "Alternating Current Generator" we read that they must "give an E. M. F. curve, which, under all working conditions, shall be as nearly as possible a sine wave." We should very much like to know what were the reasons that induced the committee to arrive at this recommendation. Did they introduce it so to avoid possible dangers from resonance or with the idea that alternators would work better "in parallel" when they gave sine waves? They may possibly have thought that transformers and arc lamps would work better with sine waves. As a matter of fact, however, is a physical impossibility to make an alternator that will give anything approaching a sine wave under "working conditions." Are manufacturers to understand that the pole-pieces of a field magnets must now be twisted so to avoid the harmonics caused by slots in the armature? We fail to see what good is being done by the committee publishing recommendations like the one given above, without stating the object which is to be gained by following the recommendation. The Committee hint that they will probably relax stringency of the usual conditions regarding the rise of temperature in motors. It is stated that the recommendations are likely to be "more liberal" than those laid down by the American and German Electrical Standardisation Committees. We suppose, therefore, that a consumer in the future may be able to get a cheaper machine. Whether this is an advantage or not depends on the durability and efficiency of machines which heat excessively.

The Port of Liverpool.

In the early part of the present month the Mersey Dock and Harbour Board had under consideration an important scheme recommended by the Works Committee, involving an expenditure of £222,000, for the extension of the Brunswick Dock over the site of the Union Dock and the Brunswick Graving Dock, the formation of a channel 100 ft. wide from the Toxteth Dock, and the erection of two sheds, one 1,800 ft. long by 150 ft. wide and the other about 500 ft. long. These important works were authorized last week, and, when completed, will constitute a very valuable addition to the facilities of the port. At the same time we may mention that a large graving dock is now under construction on the Mersey, in pursuance of the Act of 1902. The steel gates of this dock, 135 ft. wide, are of special interest, being wider than any hitherto constructed. Huge quantities of sand have been removed from the river during the past year, no less than 2,993,500 tons having been raised and conveyed out to sea by the sand pump dredger *Coronation* since September 1903. From the bar and shoals in

en's and Crosby channels 7,923,300 cu. yds. of sand were dredged during the past year. Some idea of the herculean task undertaken by the engineering staff may be gathered from the statement that, since the commencement of dredging in 1890, a total quantity of sand removed from the river is approximately 80 million tons.

FROM recent correspondence in the *Times*, it appears that negotiations of some kind in progress which may involve the demolition of the tower on the ancient city wall of Newcastle. Very little now remains of the ancient fortifications of the city, and it is almost impossible to believe that the inhabitants would permit the destruction of so valuable a relic as that which is now patterned. There is evidently some mystery about the matter. On one hand, Mr. Rawnsley refers to the common belief that the tower is doomed and to contemplated action by the local society of antiquaries, and, on the other, Mr. Lambert—who was born in the tower—is a trustee of the Incorporated Company of Masons, to whom it belongs—merely states that he and other members are not consented to the sale. This is a stark saying, and, coupled with the statement that Mr. Lambert does not give his refusal on antiquarian grounds, seems to justify apprehension. We sincerely trust that public attention will not be diverted from this threatened piece of vandalism.

THERE are two points in the evidence (as reported) given before the Special Committee on the administration of the Chantry Fund, on which we would say a word. In the first place, what is the meaning of the strange opinion expressed by the President of the Royal Academy, at the close of the evidence, that "French influence had tended to debase art, and had induced young men to take no trouble to learn anything at all"? Does this include French landscape-painting? Does it apply to such painters as M. Béraud, or such sculptors as MM. Mercier, Carpeaux, and Alfred Boucher, Gustave Boulle, and others who might be named? Is a comment on Impressionism it might be just; but French art is not all Impressionism. Another point is—how is it that among the names of artists who have been passed over, which have been repeated more than once in the evidence and in articles written on the subject, we hear nothing said of Mr. Arthur Hughes, one of the most gifted of the group who used to be called præ-Raphaelites, and whose pictures have been on the line at the Academy over and over again? He is a far more important artist than Frederick Sandys, whose name has been brought forward; and we can recall some of his pictures—his beautiful triptych, "Viola d'Amore" for instance (a work quite beyond popular appreciation), which would have been better worth purchase than some score or so, at all events, of the paintings in the Chantry Fund collection. The new Selection Committee, when constituted, might as well consider whether they cannot in this respect do at least tardy justice to a gifted painter who has been unduly neglected.

THE ARCHITECTURAL ASSOCIATION. EXCURSION.

FOR the thirty-fifth annual excursion of the Architectural Association, the committee have chosen the south-eastern corner of Somersetshire and the borders of Dorsetshire, with the old-world town of Sherborne as a centre. Here, in accordance with the usual custom, the majority of the excursionists took up their quarters, at the Digby Hotel, on Saturday. The President of the Association (Mr. Guy Dawber) took the chair at dinner, and a pleasant opportunity was afforded of meeting old friends and reviving reminiscences of former happy tours. Although this is the fifth occasion on which the Association have visited Somersetshire, the splendid list of attractions prepared by the untiring hon. secretaries, proves that the county is by no means yet exhausted. Former centres have been at Wells, Bath, Yeovil and Taunton; and but few of the places included in this year's programme have been previously visited. It is now twenty-one years ago since Yeovil was made a centre on the occasion of a visit to these parts, and but few members could recall that occasion. Sunday was quietly spent, many of the party visiting the Abbey church. Rain fell plentifully in the early part of the afternoon, but, in spite of threatening appearances, a drive was taken in the neighbouring district of the east of Sherborne.

Village of Trent.

The official programme of the excursion commenced on Monday morning, when the two breaks and a wagonette started from headquarters, full of good-humour, sketching paraphernalia, cameras and luncheon hampers for the north and north-west. The morning appeared inclined to be wet, but, fortunately, though some sharp showers fell, they did so at convenient intervals. After a drive of a few miles the party came to the little village of Trent, and alighted at the lychgate leading to an old-world burial-ground, with its old cross in a base of circular steps.

The lordship of Trent in the days of the Normans and Conquest was part of the vast possessions of Robert, Earl of Morcton. The church, which is dedicated to St. Andrew, consists of nave and chancel, a chapel on the north side, and a transept on the south, with porch and a small baptistry at the west-end of the nave. The nave and chancel are Perpendicular, but the tower is Decorated; it stands over the south transept, and is of rather fine design, terminated by a pierced, quatrefoil parapet, supported by a corbel table, with crocketed pinnacles at either angle. Rising above is a spire 35 ft. high, with moulded angles. This is one of the very few spires to be met with in Somersetshire, and it has been suggested that the idea emanated from Warwickshire, the county from whence the patrons of the church came.

On the north side of the nave is a chapel corresponding with the south transept: the eastern window, as well as a single lancet light in the western end, belongs to the Decorated period. Under the recessed arches in the north wall of this chapel are two stone effigies, one representing a man in plate armour of the period of Edward III.; attached to his girdle is a great sword on the left side, and a short dagger on the right, but it is not known whom the figure represents. There are slight traces of colouring. The other effigy is of a different character, and represents a civilian—probably a youth. The chapel is, perhaps, that of the chantry, founded by John Frank, a native of Trent and Master of the Rolls in the reign of Henry VI., and a lawyer of great repute in his day. The chantry was founded within the church, and this chapel appears to be the only part of it appropriate for the chantry altar and services. It was, however, probably used for some other purpose previous to the foundation of the chantry *temp.* Henry VI., as it appears to be of much earlier date, and is supposed to have been originally a Lady Chapel. On the suppression of chantries, the temporalities of this one, together with the mansion of the chantry of Trent, and stables and garden adjoining, was granted to William Fontoutay and Richard Mayne for the sum of 6*l.* The house of the chaplain is still standing adjoining the churchyard, and has some of its original windows remaining. The chapel itself was taken possession of by the Gerard family, and the site of the arch dividing it from the nave is decorated with two genealogical trees,

containing nearly forty shields of arms of Thomas Gerard and Ann Coker his wife, and their respective alliances. The rood-screen is a fine specimen, consisting of three perpendicular tracery bays, the central one with doors; a fan vault carried the rood passage, the cornice being richly decorated and gilt. The ornamented cornice, instead of being of carved wood, appears to be in some parts of plaster. The pulpit is very ornately carved with Biblical subjects, and apparently had its origin in Belgium or the Low Countries. Very many of the original seat-ends remain, and are quaintly carved with heraldic devices. Some parts of the church have been restored, and there has been rather too liberal a use of cement, but still several features commanded attention, more especially the exterior and the really fine tower and spire.

The sketchers found much to interest them out-of-doors, and the water-colourists of the party worked under particularly good conditions, as by now the day had decided to be brilliant. The fine old grey spire, surrounded by foliage of sombre yew trees; the Manor House and adjoining farmyard; the ancient presbytery, with its old-world garden nestling among the elms, provided a variety of picturesque subjects. Adjoining the church is the Manor House where King Charles II. lay concealed for more than a fortnight, during which period the house was rigorously searched on more than one occasion. The hiding-place is a dark space between a ceiling and floor above, apparently constructed intentionally, with scarce room to stand upright. From here Charles made his unsuccessful attempt to escape from Lyme, under the guidance of his host from Trent, Colonel Wyndham, who, for this and other services, was rewarded with a baronetcy and a pension.

Queen Camel Church, etc.

The next place on the programme was Sandford Orcas, but this house unfortunately had to be omitted, and instead the party drove some five miles to Queen Camel, an interesting church placed almost under the shadow of Camelot, famous in Arthurian legend—

"Like Camelot what place was ever yet renowned,
Where, as at Carlon, he kept the table round?"

The church has many interesting features, but its principal glories are undoubtedly the four fine timber roofs over chancel, nave, and aisles. The chancel roof is of arched form, in six bays, with many quaint and unique carved bosses of a variety of biblical and heraldic subjects, in several of which animals figure prominently. The mediæval idea of a camel is especially worth noting. Angels bearing shields support the principals, and between is a boldly-carved wood cornice. The nave roof is flat. It consists of five bays supported on stone corbels, and originally appears to have been panelled, though, at some later date, rafters were substituted for the panelling, with the exception of the half of the easternmost bay, which retains its original form. The clerestory is lit by three light windows, arranged centrally over the nave arcade, which consists of octagonal piers with moulded caps and bases. The arch between nave and choir is panelled, and in this respect recalls the nave arcade of Sherborne Abbey. One of the most interesting features of the church is the very fine and lofty rood-screen, in five perpendicular bays, and richly carved cornice. The church was well restored some thirty years since by Mr. Pearson. It contains many monuments, mural and otherwise, to the St. John Mildmay family. The font is of rather an unusual type, octagonal in form, with small square angle pillars with niches containing saints.

Luncheon was partaken of in an adjoining meadow, and afterwards a start was made for Hazelgrove, the seat of Captain Mildmay. This house was not on the programme, but was substituted for Sandford Orcas, and the short time allotted to it proved only sufficient for a cursory examination. The beautiful late Renaissance carved work in the dining-room, ornate in character and executed with wonderful skill and spirit, was brought here from Dartmoor House, and admirably adapted to its new surroundings. A small and low apartment adjoining forms part of an older building, and contains a good XVth-century plaster ceiling. It is known as Queen Elizabeth's room. The garden forms an attractive setting to the house, more especially the simple lines of kitchen garden with its intersecting yew alleys and gay borders.

North Cadbury Church.

From Hazelgrove a drive of two miles brought the party to North Cadbury, whose church, dedicated to St. Michael, was rebuilt by Elizabeth Lady Botreaux about 1415. Here the party were met by the Vicar, and an interesting paper was read upon the history of the fabric. The chancel was restored some thirty years ago, when a flat stone was discovered on the top of the wall plate, with a date, 1417, scratched upon it, and underneath it a mason's chisel. The church was formerly collegiate and in Dngdale's Monasticon is a copy of the charter granted by Henry V. It is a good specimen of the earlier Perpendicular style and consists of a tower, nave, chancel, north and south aisle, and north and south porches. Tradition says that the tower was first built and stood alone for some time. This is borne out by the appearance which the junction of the side aisles with the tower still presents. Both aisles appear to have been joined on to the tower and of later construction. There are four clustered columns on each side of the nave, and above are clerestory windows.

The wall of the south aisle encloses a portion of the string course of the tower above the clerestory windows; and in the north aisle may be seen one of the tower buttresses with the old string course. The roof of the nave, side aisles, and chancel is of oak covered with lead, and over both nave and chancel it is supported by well carved stone brackets. There is an ancient stone font at the west end of the nave. The whole building is practically of one date. The only fragment of an earlier church consists of portions of the piers and capitals of the nave arcades. One of the most striking features about the church is its excessive symmetry. There is even a two-story porch on the north side to match that on the south, and the only difference in the two elevations are due to the tower stair turret on the south side, and a vestry on the north. Mason marks abound on the outside of the church. It is probable that at some period the vestry may have been in use as a school, and two black letter alphabets can very plainly be deciphered painted upon the wall. In the church register is recorded an accident which occurred in the XVIIth century when one of the heaviest bells falling from the tower completely ruined a monument standing below. The oak seating, which is dated 1538, appears to have been partly Dutch and partly English, a mixture of Gothic and Renaissance detail. Under a yew tree in the vicarage garden may be seen the fragments of an elaborate stone pulpit dating from the XVth century.

Manor House, North Cadbury.

The Manor House adjoins the churchyard on its eastern side; a short carriage drive leads to the forecourt and north front of the house, with its charming variety of outline and collection of gables, its lichen-covered walls of warm-toned masonry and stone-slatted roof. On the western side is a picturesque addition, supported upon a bold arch. The plan is distinctly medieval, and whilst its decoration clearly belongs to a later date, it is very probable that much of the walling is earlier. The north side is by far the most attractive, and this was originally approached through a square forecourt and imposing gate-house. Unfortunately this has disappeared, though the inconvenience of having to approach the house on foot across the forecourt is hardly consistent with the greater comfort demanded in the present day. The character of the house has suffered much from the rebuilding of the south front in the early years of the last century. After seeing over the Manor House, the party were hospitably entertained to tea by the Vicar, who produced interesting souvenirs of the church's history. Then, at the sound of the quartermaster's whistle, a start was made at six o'clock for the long and hilly drive home to headquarters, passing *en route* the historic hill of Camelot, whose extensive earthworks indicate the important part this fortress town played in the early history of these parts.

Tuesday.

The second day of the excursion was devoted to the district south-west of Sherborne, and at 9.30 train was taken for Crewkerne, when the brakes met the party. A drive of several miles through lanes and orchards brought the excursionists within sight of the town of Beaminster, delightfully situated in a valley, its church tower rising proudly from amongst the collection of

stone roofs of the old-fashioned town which lies embosomed among surrounding hills, through which a peep may be obtained of the English Channel and Lyme Bay.

Beaminster Town and Church.

The town suffered great hardships during the Civil Wars, when an army under the command of Sir Thomas Fairfax "marched from Dorchester to Beaminster. The train and most of the foot quartered on the top of an hill; some laid in Beaminster town, a place of the pitifullest spectacle that man could behold, hardly an house left not consumed by fire, the town being fired by some of the enemy in five places at once when Prince Maurice was there, by reason of a falling-out between the French and Cornish." So record the chronicles of the day, and we are told that later on the inhabitants were successful in obtaining an ordinance of Parliament for raising 2,000*l.*, with which some part of the town was rebuilt. It was, however, again destroyed by fire in 1684, involving very heavy losses. It suffered from fire yet a third time in 1781. Then in the course of three or four hours all the houses on the west side of the street leading from the church to the market place were destroyed. These disasters no doubt account for the lack of old buildings to be met with in a town where one might have expected more.

The church consists of chancel, nave, north and south aisles, with another aisle or Lady Chapel north of the chancel. The tower is of good proportions, rising nearly 100 ft. in height, with highly ornamental angle buttresses and small crocketed pinnacles rising from their several spays; an additional air of elaboration is imparted by the miniature pinnacles in the upper story rising out of grotesque corbels, and entirely detached from the wall. About 8 ft. from the ground level the tower is encircled by a band of quatrefoil and tracery. In the second story on each face are square-headed windows, each of two lights. The upper story has pointed windows, each of two lights, divided by a central pier, at the foot of which is a small pinnacle, the shaft all anglewise, rising from a corbel placed in the centre of the string which marks the stage. On the west front of the tower are three niches: the central figure represents the blessed Virgin seated, on the right hand the figure of St. James, and on the left St. George subduing the dragon. Above these is a small square-headed window, walled up, and having beneath a small sculpture of the crucifixion, with the Virgin Mary and St. John; higher up are further niches and pinnacles, with central groups representing the Resurrection and Ascension. On each side are figures in the costume of the day, one a Palmer the other a Fuller, said to represent two of the principal contributors to the building of the tower. The whole structure is of uniform Perpendicular character, dating from the latter part of the XVth century, excepting a portion which is an elongation of the south aisle; the original purpose of this part is uncertain, but it is known as the "Mort House." The nave consists of five bays; the capitals of the three westernmost are of a pleasing type, entwined with a chaplet of vine leaves and fruit. The nave has a modern roof, but the aisles still retain their original oak roofs, the plaster by which the framework was hidden having been removed in recent years, and the whole restored. These roofs are not of a very interesting type, and from an almost entire absence of mouldings, are extremely severe and heavy. On the wall of the south aisle are two interesting monuments of marble, both belonging to the Strude family, and dated 1698 and 1746 respectively. A small stairway still remains, which formerly led to the roof-loft, which has, unfortunately, been removed.

Melplash Court.

The carriages were now taken and a short drive brought the party to Melplash Court, a typical Jacobean manor-house, with two fine old elm avenues leading to what was doubtless the forecourt of the house, which lies in a slight hollow, surrounded by its barns, farm buildings, and an ancient circular dovecote, with stone slatted roof and quaint cupola, easily capable of accommodating 250 pigeons. Here the party took luncheon under the avenue, and afterwards saw the interior of the house. The large dining-hall is now used as a kitchen, and has an elaborate plaster coat of arms. The buttery screen still remains intact. The parlour contains a fine chimney-piece—removed from another part

of the house—with the arms of England, France, Scotland, and Ireland, and the initials of "Jacobus Rex." Adjoining the house on the back is a small building called the chapel, probably only a domestic one, if ever thus used.

Parnham House.

The next place visited was Parnham House, where the owner very courteously conducted the party over the old Manor House, many years ago the seat of "the right antient and worshipfull familie of Strodes." Here they flourished a knight's degree, showing considerable astuteness and much bettering their estates by a careful selection of the heiresses they took for wives. We may gather from a minute and curious worded survey of the estate drawn up by Sir John Strude in 1628, that the mansion was rebuilt and enlarged with "Hamden Ashlar" by one Robert Strude in the reign of Henry VI. Unfortunately the alterations carried out in the early part of the XIXth century rather spoil the character of the earlier work, but the present owner has done much to keep the original character of the building, the treasure of which provided much material for study. The hall has a Tudor screen, a fine Renaissance fireplace, and many splendid suits of armour. A small apartment on the ground floor contains a very fine specimen of a Tudor fireplace, with its massive oak cambered beam and carved tracery panels.

Crewkerne Church.

The party then had a long drive of some eight miles northward to the town of Crewkerne, with its church on a slight rise. Crewkerne Church is one of the great cross churches of the country. The west front has a fine late-decorated doorway with niches on either side surmounted by busts. The gable of the nave is flanked with octagonal turrets embattled with vestiges of small pinnacles. As in so many churches in the country the nave is of better work than the chancel, it is also very much loftier. On the south side is a very large porch, something similar to the south transept. A curious change was made when the porch had been converted into a transept, and the transept into a sort of porch. The windows in the nave are very wide, so that there are only three bays where there would have been probably more in a nave of the length. The extreme flatness of the transept windows is remarkable. The north transept is the most elaborate part of the church. There are indications of a vestry below the east window, but this building has been destroyed, the doorways alone remaining. At the southern east corner of the church, which formerly contained the figure of the patron saint, are indications still remain of an iron grille which protected the statue. The church contains examples of three distinct periods of Perpendicular work. To the earliest period belongs the whole of the chancel and much of the southern transept, the second period the whole of the nave, aisles, porch, and tower, together with some alterations to the south transept, the works probably extending over a considerable period during the reigns of Henry VII. and Henry VIII. The third period is shown in the north transept, together with a series of chapels between it and the chancel. In the porch is a fan vault and stoup and outside on the parapet a very interesting series of gargoyles. Those over and around the porch welcome the people with a hymn of praise, with mediæval harps, lyres, tambourines, and bagpipes. The tower has several curious features; the lower part was probably early work, though now completely cased in. Perpendicular masonry; at three of the corners the buttresses stand within the church. Abutting on the churchyard is the old grammar school founded by John de Combe in 1499. It forms a very interesting feature, and in the market square is an interesting mediæval house of the XIVth or XVth century. Crewkerne was the last item on the programme for the day, and the short space of time left the party admitted of only the most cursory examination. Train was then taken to Sherborne. The day had been of great interest, and though overcast the rain did not interrupt proceedings.

Clifton Maybank Manor.

Wednesday.—The climatic conditions for the third day's work of the tour were anything but agreeable, and in consequence a change had to be made in the programme, and instead of driving to Clifton Maybank as had been originally

ended, the breaks were sent on ahead, first the party followed to Yeovil Junction by train. Clifton Maybank was probably built by Sir John Horsey, whose name and family arms, with the date 1586, are in one of the Hall windows. A great part of the former noble mansion has been pulled down, but enough is still standing to show that it was once quite an important mansion. A remaining wing was built by the Horsey family early in the reign of Henry VII. This wing inherited it from the Maubanks; after nine years the property passed to the Harveys. Manuscript account, dated 1648, gives the following quaint description of the house and environs:—"The capital messuage consists of a faire yellowe freestone buildinge, partly of wood and partly three stories. . . . In the front of the house a square greene court and a square gatehouse with lodgings in it standing to the front of the house to the south. . . . Without the gatehouse paled in a large square pence, in which standeth a faire chappell; the south-east side of the greene court, towards the river, a large garden. Of the north-west side of the greene court is a large bowling greene, with fower mounted walks about it, all walled about with a battled wall, and set with all sorts of fruit; and out of it to the fields there are large walks under many call elmes orderly planted." According to Hatches, the gateway leading into the court ascribed to Inigo Jones, and was erected by Sir Ralph Horsey in the reign of James I. It was taken down in 1800 and transferred tointon St. George, by Lord Paulet. The front of the building was purchased by Mr. Phelps, and erected against the west front of Montacute House, where it now remains. In the western angle of the now remaining wing is a fine oriel window, on which are carved the three horses' heads of the Horsey family and two roses. The terrace surrounding the bowling green and garden may still be traced.

Brympton Church and Manor House.

From Clifton Maybank a drive of about four miles took the party to the green-turfed forecourt of Brympton Manor House, with its nicely-proportioned stone balustrade wall and gate piers. The mansion and Church of Brympton form quite a striking architectural group. A large and stately mansion, a house of humbler pretensions, and the parish church all lie close together, and all are worthy of attentive study. The church is small, and originally was of the Decorated style, without aisles or tower. The south transept has a beautiful geometrical window to the south and a foliated arch connecting it with the nave; the south door is foliated. But one Sydenham, a pious benefactor in the reign of Henry VII., founded a chantry for three priests. He built for their dwelling-place the house which still remains, on the north side of the chancel, and at the same time modified the church to adapt it to his purpose. He made an eastern addition to the north transept, and altered the appearance of the gable so as to give it the external appearance of an aisle, whilst internally there are two chapels. The roof-screen is of stone, quite an uncommon feature in a parish church, and in all probability dates from the XIVth century. There is a quaint bell-cot, with quite a distinctive charm of its own, on the western gable, and the graveyard contains several well-designed tombstones. The so-called chantry house, now used as a toolshed, is on the right-hand side of the entrance courtyard. It is an oblong perpendicular building of two stages, with an interesting and remarkable octagonal turret giving access to the upper chamber, which is very large, with a good open roof and some fine plaster ceilings of later date. On the south side of the larger room is a small doorway, which was the entrance to the garderobe. Taken as a whole, the building presents the common type of a mansion house of the XIVth or beginning of the XVth century.

After the larger mansion had been built by the Sydenhams, this old manor house appears to have fallen into neglect, but early in the XVIIIth century it became necessary to make use of it again as a place of residence. This may have been on account of the alterations then being made to the larger mansion. The north-west portion of the house retains its early character, and there is a fine display of oriels, turrets, chimneys, and open battlements. The central part containing the hall has been altered in Elizabethan times, but it retains its original basement and a curious kind of oriel. The south

front of the house retains its original walls, but early in the XVIIIth century, when the house was brought "up to date," a classic front was added and the house was generally reconstructed. Horace Walpole is responsible for the tradition that Inigo Jones was employed on this work, but it was actually carried out by his nephew John Webb. The mullions and transoms employed in the pedimented classic windows are very unusual at this period, when the Classic styles were fully launched on this country; the refinement of detail which Jones shows at Wilton House and Coleshill, both anterior to Brympton, are certainly lacking, and the whole work much more suggests the hand of Webb than of Inigo Jones.

On the garden, or south front of the house, is a broad terrace belonging to the early part of the XVIIIth century. It has a broad central flight of steps, and at either end two smaller flights arranged at right angles. The piers support urns of different designs, with the exception of one which carries a sundial with gnomons on the sides of a square die. The porch of the house has a date 1722, when it is supposed to have been brought from Clifton Maybank, when that house was destroyed. The rooms are large and lofty, and contain some good tapestry and excellent portraits by Lely. Sir S. Ponsonby Fane very kindly entertained the party to luncheon, and in the afternoon they drove to Newton Surmaville, an Elizabethan building and seat of the old family of Harbin.*

TRAMWAYS AND LIGHT RAILWAYS ON PUBLIC ROADS.

THE following is a copy of the letter which has been received by Mr. W. Rees Jeffreys, the Honorary Secretary of the Roads Improvement Association, Down-street, Piccadilly, W., from the Board of Trade with reference to the matters connected with tramways and light railways on public roads, and bridges over railways and canals, which formed the subject of the representations made by the deputation from the Association to the Board on July 18:—

"I am directed by the Board of Trade to refer to the deputation received by Sir H. Jekyll on the 18th instant from the Council of the Roads Improvement Association, on the subject of tramways and light railways on public roads.

"The Board have carefully considered the representations then put forward with regard to the questions of centre poles, width of roads, and bridges over railways and canals, and I am to reply as follows:—

"(1) *Centre Poles.*—The Board do not see their way to recommend total prohibition of the use of centre poles, as there might be cases of exceedingly wide roads where such poles might be the best arrangement or other cases where, for some reason, centre poles might be necessary.

"The Board feel, however, the force of the objections stated by the deputation, and will be prepared to enact in Tramway and Light Railway Orders that centre poles shall not be used without the express consent of the Board of Trade. They will also communicate with the Parliamentary authorities concerned in private bill legislation as to the desirability of such a provision. In this way promoters will be required to justify the use of such poles in each case as it arises.

"(2) *Width of Roads.*—The Board do not consider that it would be advisable to fix a statutory limit that might have the effect of prohibiting by severance urgently needed lines. In dealing with applications for tramway and light railway powers, the Board always keep in view the 9 ft. 6 in. space referred to in Section 9 of the Tramways Act, 1870 (a limit which would appear to be reasonable), and make provision to secure it wherever practicable. The representations made by the deputation on this point will, however, be borne in mind.

"(3) *Road Bridges over Railways and Canals.*—Most of what was urged by the deputation with regard to this matter would appear to be for the consideration of the Local Government Board and not of the Board of Trade, this department being only empowered to deal with appeals from owners of road locomotives who may feel aggrieved by restrictions placed on the use of bridges over railways by such locomotives, either by notice under the Locomotives Act 1861 or by law under the Locomotives Act 1878. With regard however to the request for

* To be concluded in our next.

legislation to enable a county council to require the owner of a bridge to maintain it at its original strength, I am to point out that section 65 of the Railways Clauses Consolidation Act 1845 provides a procedure under which either a road authority or any two householders in the locality interested may take steps to compel a railway company to repair their bridges."

BRITISH ARCHÆOLOGICAL ASSOCIATION CONGRESS AT BATH.

THE sixty-first Annual Congress of the Association was held at Bath, from the 8th to the 13th insts., that city not having previously been visited since 1856, when the meeting was held jointly at Bridgewater, the Congress removing to Bath for the latter part of the week's proceedings.

The Congress was opened on Monday, the 8th, at 3 o'clock p.m., at the Guildhall, where the members were heartily welcomed by the Mayor, Alderman Major C. H. Simpson, J.P., M.C., and the members of the Local Executive Committee. After the President of the Association, Mr. R. E. Leader, B.A., had duly acknowledged the cordial reception extended to the members of the Congress by the Mayor and Corporation and the Local Committee, the party proceeded, under the guidance of the Mayor, to view the Guildhall and Municipal buildings.

Bath Abbey Church.

The Abbey Church was next visited, where the members were met by the Rev. H. L. Maynard, in the absence of the Rector, the Rev. Prebendary Boyd, who gave some descriptions of the building and related its history. The bases and portions of the columns of the Norman church, which are carefully preserved beneath the flooring of the present church, were examined with great interest; they, together with others just outside the east wall of the church, appear to belong to the edifice erected by Bishop Robert about 1160, the successor of John de Villula, who purchased the city of Henry I. for five hundred pounds of silver, together with the Abbey, and rebuilt the latter from the foundations. The Norman church must have been of grand proportions, if, as is said, the present church occupies the site of the Norman nave only. The existing building was commenced in 1500 by Bishop Oliver King, and is one of the latest examples of Perpendicular work in the country. Although there are, here and there, features of beauty, the general effect is that of coarseness and lack of refinement, due mainly to the largeness of the mouldings and want of delicacy in the details. The curious carvings on the west front, of angels ascending and descending ladders, representative of the vision of the Holy Trinity, which Bishop Oliver King saw in a dream one night in 1499, attracted much attention; the figures, however, although well executed are now much defaced.

President's Address.

Under the guidance of the Rev. C. W. Shickle, M.A., and Mr. Sturge Cotterell, the local hon. secretaries, visits were made to the hot mineral baths, the museum, and the Royal Literary Institute, and to some of the historical houses in the near neighbourhood. The party then returned to the Empire Hotel for dinner, and, at 8.30 p.m., attended a conversation given by the Mayor at the Pump Room and Roman Promenade. During the evening the Mayor expressed the great pleasure it had given him to receive the members of the Association, and then called upon the President to deliver the inaugural address. After dealing with the subject of archaeology generally, and contrasting the apathy and indifference displayed in the past towards the preservation of national monuments and objects of antiquity, with the attitude towards such matters at the present day, Mr. Leader went on to say—"Much irreparable mischief had been perpetrated in the last sixty years, much grievous vandalism had been rampant; but infinitely more would have had to be regretted but for the influence exerted by the British Archaeological and kindred associations." "Archæological enthusiasm had been spread abroad and new investigators had been brought into the field. Antiquarian research was no longer the possession of the few. It was widespread. It had its schools, and its chairs, and its endowments at the universities. One even heard of some rudiments at least being taught in our elementary schools. There was good reason to hope that before long the University of London would grant a degree in

archæology." Referring to the visit that afternoon to the Abbey church, the President said—"He was sorry to think that even in Bath—cultured, refined, educated Bath—it had been possible to mutilate the piers of the Abbey church in order to put in iron supports for an organ of not the most beautiful construction. If such an eyesore could be found in Bath, how could they wonder at outrages being perpetrated elsewhere? The Association was successful in Sheffield last year in saving an ancient monument from possible destruction, and it would be very gratifying indeed to members of the Association if any words from the Presidential chair should help to remove from the Abbey the disfigurement he had mentioned." "Bath had been exceptional, and was still exceptional, not only for the antiquities it possessed, but for the men who had devoted a large part of their lives to the study and elucidation of its antiquities. They had almost a literature of their own relating to Bath archæology. In the *Transactions* of archæological and other societies were numerous papers and articles relating to the city and its neighbourhood, contributed by learned antiquaries, while scattered throughout English literature, in memoirs, gossiping diaries, and romances, in reminiscences and novels are pictures of the social and fashionable life of which the city was the centre. The pages of their own *Journal* were enriched by those papers contributed by Bath's learned antiquaries when the Association met here nearly fifty years ago. The only justification for his attempting to add a few crumbs to the rich repast was that some records which recently came into his hands had never been published, and though they told the students of Bath life nothing new, they were not perhaps without their value in helping them to realise the doings in the city of Bath at the time when Beau Nash had made himself the controller of its destinies, and was, he supposed, at the height of his power. The housekeepers' accounts of the Howards of Worksop Manor contained payments made in connexion with visits to Bath by Lady Mary Howard in 1732 or 1733. They showed what a costly and elaborate pilgrimage was involved when a noble family journeyed to take the waters in the fashionable city. Before starting, large provisions of gay garments had to be made—French gowns, lace, and the rest. Remembering the greater value of money at the period, very considerable expenditure was implied in such items as 91l. 2s. 9d. for 'linen, lace, etc.,' 42l. 10s. for lace for Lady Fanny Shirley, and 15l. for 'linen for Mr. Southcote.' There was paid 4l. 12s. 9d. for habermaking and trimmings. There were twelve horses on the road costing 6l. 7s. 10d. Eating on the road cost 15l. 9s. 8d. Servants' drink on the road 1l. 8s. Arrived at the destination the expenditure was on the scale of a large establishment." Mr. Leader remarked that there was a certain undesigned appropriateness in Bath being chosen for this year's Congress in succession to their visit to Sheffield last year. Utterly dissimilar as were the two cities in the part they played in the nation's life, there were certain points of contact between them of no little interest. The first book of importance printed in Sheffield was a substantial quarto on the nature of the mineral waters, written by a Sheffield physician, Dr. Thomas Short. The two cities had also a joint share in the careers of two remarkable men, John Arthur Roebuck and the Rev. James Hunter. Sheffield gave Mr. Hunter to Bath, and Bath gave Mr. Roebuck to Sheffield. Both came of Sheffield families, both married Bath ladies, and Mr. Roebuck, while paternally descended from Sheffield, was on his mother's side the great grandson of a man famous in the musical annals of Bath—Dr. Lindley, one of whose beautiful daughters married Richard Brinsley Sheridan. In concluding his address, the President commended the action of the Corporation for its care in indicating by memorial tablets the residences of celebrated men and women of the past; he also expressed his appreciation of the value of the very carefully prepared historic map of Bath, by Mr. Sturge Cottrell. The company then descended to the Roman baths, which were illuminated by electricity, where Mr. Alderman Moore gave an interesting description of their discovery.

Great Chalfield Church and Manor House.

A large party set out in carriages on Tuesday for Great Chalfield, Bradford-on-Avon, Farleigh Hungerford Castle, and Hinton Charterhouse. South Wraxhall Manor House,

a fine example of domestic architecture of the XVth century, was viewed from the road, time not allowing of a visit to it. On reaching Great Chalfield, the Parish Church was first visited, and was described by the Rev. C. W. Shickle, M.A., F.S.A. It consists of a nave, chancel, and side chapel, built in the XVth century, by Thomas Troponell, who obtained the manor by marriage into the Percy family. There is no tower, but a very picturesque corbelled-out bell turret and spire surmounts the western gable; it is of the decorated period. The church has been altered in many ways, and is in an unseemly condition, the walls being covered with yellow wash and the arches oak grained. The Manor House is of the XVth century, and immediately adjoins the little church, and constitutes, with the barns and farm buildings, of the time of Elizabeth, a most picturesque group of buildings, all surrounded by a water moat. In the Civil War the house was occupied by troops. Leaving Chalfield, the drive was resumed to Bradford-on-Avon, where, after luncheon, the Parish Church was visited, the party being received by the Vicar, the Rev. S. G. Collison, M.A., who gave a description of the edifice, which is of a very interesting character. It is dedicated to the Holy Trinity, and dates from about 1100. The chancel was lengthened in the XIVth century; it was originally only two-thirds of its present length. The tower at the west end is of late XVth century date, and has a groined and vaulted lower story. There are several interesting memorials in the church. On the south side of the chancel is a mutilated effigy of a cross-legged knight under a canopy, to a member of the Hall family, and on the north side a recessed tomb and effigy of a female wearing a wimple, considered to be Agnes Hall, who died in 1270. There are traces of a rood-screen, and there is a large and long hagioscope on the north side. There is also a brass to one Thomas Horton, who was a clothier in Bradford, and is thought to have built the tower.

The Saxon Church of Bradford-on-Avon.

The Saxon Church, dedicated to St. Lawrence, founded by St. Aldhelm, Abbot of Malmesbury and the first Bishop of Sherborne, in 705-709, was next visited, and was described by Mr. Chas. S. Adye. This very remarkable building has now been completely cleared of all the encumbrances which existed when the late Canon Jones first discovered its sacred character, and we now behold an almost unaltered Saxon church of the early VIIIth century. The chancel seat is still *in situ*, the arch itself of very narrow proportions, and over it are carved two large figures of angels, each wearing flowing robes and a nimbus, and probably at one time there was a crucifix between them. The exterior presents a remarkable appearance, the walls being arched and panelled, with arches supported on pilasters, with heads and bases of like character. From the Saxon church the party, under the guidance of Dr. Beidcoe, proceeded to view the exterior of the old Hall, which is a very fine example of domestic architecture of the early XVIIIth century. It was built by one of the Halls, who were wealthy clothiers in Bradford. This was the house, an exact reproduction of which was erected as the Royal Pavilion at the Paris Exhibition in 1900, as a typical example of an old English Manor House. The Tithe Barn, erected about the end of the XIVth century as a Tithe Barn for the Abbess of Shaftesbury, and the old Bridge were inspected, and the party resumed the carriages to Farleigh Hungerford Castle.

Farleigh Hungerford Castle.

Here, in the outer court, Mr. Patrick, hon. sec., read some notes on the history of the Castle, and pointed out the chief remaining features. In its original form the Castle comprised two courts, north and south, surrounded by a lofty encinte wall. On the south and west sides there was a moat; the other sides were protected by the steepness of the ground. The principal entrance was on the south-east side, where the remains of the gateway still exist, over the arch of which is the sickle, the crest of the Hungerfords, and higher up a shield of arms, with the initials E. H. In the outer or lower court are the remains of the guard-room, stables, etc. The chapel, which is the most interesting part of the Castle, is also situated in the outer court, on the right of the entrance gateway. It is well preserved, and

consists of a nave and chantry chapel on south side. The chapel is now used as a repository of local antiquities, and contains a large quantity of soldiers' armour of the XVIIth and XVIIIth centuries, banners, brig bits, stirrups, old keys, and some carved furniture. The walls of the eastern end rest some curious stencilled decoration, and a figure of a knight kneeling; while on one side of the altar is a delineation of St. George and the Dragon. There are several interesting monuments in the side or chantry chapel, including recumbent effigies, to various members of the Hungerford family, and in the vault beneath lie some six or seven corpses wrapped in lead, the outer wooden coffins have long since perished. At Hinton Charterhouse, the next halt place, Mr. E. T. D. Foxcroft met the party, and described the remains of the Carthusian Priory, one of the earliest of this order in England. Its probable date is considered to be 1232, as is related that the foundress, the Lady I. Countess of Salisbury, founded it and Abbey of Lacock both on the same day. From Hinton Charterhouse the party returned to Bath, which was reached about 6.30. An evening meeting was held in the drawing-room of the hotel at 8.30, and two papers were read.

Bath Stone.

The first was on "Bath Stone," by Mr. T. Sturge Cottrell, one of the local hon. secs. He said the Bath stone, which he was about to treat is quarried in the uplands south of Bath and north-west of Wilts, the quarries having been sunk in a vast oolite which American and Continental geologists call "jurassic" formation. From the time of the Romans down to the present day, thousands of tons have been extracted yearly from this bed, and the day is still distant when it will be exhausted. The mass structures at and around the hot mine springs, erected by the Romans two thousand years ago, are still in a state of preservation which testifies to their wisdom in the choice of the stone and to its excellence. It is quarried to the south of the city adjoining the "Fosseway," near to what is now Bloomfield Crescent. The votive altars in the museum at Bath are made of stone from the quarry on the "Fosseway," and were probably erected in the IIrd century. There were many Roman walls within the city boundary in which large blocks of the oolite stone could be found. Under the United Hospital a Roman wall exists in which there are several blocks, and on one may be seen the earliest mason's mark in Bath—viz., the letter "E." Ralph Allen and John Wood are the two most successful and conspicuous pioneers in the great industry of extracting splendid building stone from the oolite deposit. Ralph Allen came to Bath in 1715. Four years afterwards he established the system of bye and cross posts, which is the foundation of our present postal system. He was a shrewd and thorough business man, and, foreseeing the enormous possibilities when a supply of valuable building stone developed, decided to reopen the quarries at Coombe Down, and, subsequently, to devote the deposits on Hampton Down. He was succeeded by John Wood, the architect, whose genius is seen in the streets, squares, and crescents of the city. It was chiefly due to him that the efforts of Beau Nash to make the city a resort for pleasure seekers as well as invalids were crowned with a success unique in the history of the city. In the neighbourhood of Box Hill, both below and above the farm-tunnel constructed by Brunel, oolite has been extracted in large quantities as far back as Saxon times. "Hazelbury Quarre," or quarry, has been identified as the place whence stone was taken for building the Abbey of Malmesbury 1,100 years ago, and it is interesting to note that the stone for its restoration is being quarried from the same place.

Eighteenth Century Architecture of Bath.

Mr. Mowbray Green, A.R.I.B.A., next read a very interesting paper on "The XVIIIth Century Architecture of Bath," which was made more interesting to the audience by many admirable views exhibited by himself. Mr. Green prefaced his paper by exhibiting and explaining a map of the city as it was at the close of the XVIIIth century, when only measured about 1,200 ft. by 1,150 ft., and was surrounded by walls, of which there are traces remaining in the Upper Borough wall. In 1702 and 1703 Queen Anne and her

the Prince of Denmark, visited Bath, the city became more widely known, houses at that period were characterised by large windows with holocaust or wave designs round them. Of such was the Prince's Head, in Bond-street, with the initials "W. D.," and the date 1713 upon it. Old mullioned windows were then giving place to the new large sash windows. In 1716 the site of the new bowling green a row of houses was begun and called Green-street. It was one of the most picturesque parts of the town now remaining. John Wood was born in 1704, and in 1725 became interested in architecture. His first scheme was the building of a house for James Duke of Chandos. In 1727 he left London for Bath, where his men were busy, and in that year Chapel-street was begun. On the west side was the house in which Horace Walpole lived in 1765, the wing to the east was St. John's Hospital, founded by Wood in 1728. Queen-square was begun in 1728 on the eastern side. The whole was finished in seven years.

Including his paper, Mr. Green said that generally speaking the style of the XVIIIth century in Bath might be divided into three parts—that of the first twenty-five years, in which the houses had gabled roofs, and facades of large sash windows surrounded by bold mouldings, and the interiors were panelled in the rooms small and comfortable; the next twenty years when the work was modelled on classical Palladian manner with rusticated ornaments, two storied orders, a cornice and pediments with Mansard or curb roofs, while the exterior became spacious and dignified, and the interior work was brought into general use; and last twenty-five years, when the free manner of Robert Adam came into vogue and the new methods of the earlier times gave way to detailed and abundant decoration.

Wednesday, August 10.

The members of the Congress left the hotel carriage about ten o'clock for Box, Corsham, and Castle Combe. A brief halt was made at Box to view the church, which is in English, with features in the Decorated and Perpendicular styles, and a good perpendicular tower and spire at the intersection of nave and chancel. Leaving Box, Corsham was soon reached, passing on the way "Hazelbury Quarre," mentioned in Mr. Cotterell's paper, the village of Pickwick—the name of which is not an uncommon one in the neighbourhood of Bath.

Corsham Church.

Arrived at Corsham the party was met by the parish church by the Rev. E. A. S. M., M.A., who gave a brief description, then invited Mr. Patrick, hon. sec., to read some notes which Mr. C. H. Talbot sent him upon the church descriptive of its appearance before the restoration in 178. The nave arcade is Norman, and bears evidence of having been lengthened by one bay in the Norman period. The church had a central tower, removed at the restoration, when a new one was erected with a spire at the South side. The Tropæum Chapel on the north side of the chancel is of the XVth century, and has a very fine stone screen with fan vaulting under the loft: the cresting is modern. There is a piscina of good character in the south wall. The chapel contains a very fine table tomb with recumbent effigies of Thomas Trenchard and his wife Agnes, the builders of Great Chalfield Manor House. He is said to have died in 1490. There is also a second altar tomb to another member of the same family in the north east angle. The chancel exhibits no feature earlier than the XVth century, though some parts of the walls may be older. On the south side of the chancel there is a very fine chapel of the XVth century. It communicates with the chancel by two panelled arches. At first sight the east window and the easternmost window on the south side appear to have been blocked up, in the lower part, but they were so built, there being an ancient vestry inside lit by two small windows. This is said to have been the "Consistory," and as Corsham was formerly what is called a Peculiar, the vicar having had probate of wills, the records connected therewith were, no doubt, kept here. This room only rises to a slight height and there is a loft over it, open to the rest of the chapel and reached by a contemporary stair. This loft was, before the restoration, used as the vestry.

Lacock Abbey, etc.

Leaving Corsham the drive was continued to Lacock, where, at the church, the party was met by Mr. C. H. Talbot, M.A., who gave a description of the building, which is of the XIVth and XVth centuries, with a beautiful Lady Chapel, having vaulting and pendants of the date of about 1460. After luncheon at the Red Lion, the members proceeded to Lacock Abbey, where they were received by Mr. and Miss Talbot, who conducted them round the buildings of the monastery. Mr. Talbot described the buildings, which constitute the most perfect and unique example of a XIIIth-century monastic house remaining in England. The monastery was founded, as was remarked previously when speaking of Hinton Charterhouse, by Ela, Countess of Salisbury, on April 16, 1232, when Ela was in the forty-fifth year of her age, and the seventh of her widowhood. She founded the two monasteries in one day: Lacock, for canonesses of the Austin rule in the morning, and the Priory of Hinton in the afternoon, for Carthusians. The foundation of both monasteries, however, by charter had taken place some time previously. Eight years after the foundation the Countess took the veil and became abbess of her own establishment, which she ruled for some twenty years, when she retired, appointing Beatrice of Kent abbess in her stead on December 31, 1250. Five years later she died, aged seventy-four, and was buried in the choir of the church. At the dissolution the Abbey church was destroyed, but the cloisters, of the time of Henry VI., together with the refectory, chapter-house, sacristy, and other of the monastic buildings remain, and form a most valuable and interesting example of a conventual establishment. Leaving the monastic buildings, the party, led by Mr. Talbot, proceeded through the gardens to see the "Nuns' Cauldron," which is now raised on a pedestal. It holds about sixty-seven gallons, and bears an inscription on the outside as follows:—"I was molten or made by Peter Waghevens, of Mechlin, in the year of our Lord 1500. Praise to God and glory to Christ." Passing into the mansion house, the alterations made in the Abbey buildings to fit them for private residence by Sir W. Sharrington were pointed out by Mr. Talbot. In a long stone gallery, part of Sir W. Sharrington's work of adaptation, there is a very fine Renaissance chimney-piece, and here are preserved many priceless works of art. At the south-east corner of the house is an octagonal tower, also Sir W. Sharrington's work, which contains three rooms, one over the other. The lower two have vaulted ceilings, that on the first floor, known as the Monument Room, having a constructional fan vault but no fan tracery. It was originally intended to be painted, but this was never executed. In this room and the one over it are two remarkable tables of stone richly carved in the best early Renaissance style. The visitors were shown by Mr. Talbot, in the Library the Great Charter of the Abbey granted by Henry III. in 1225, once belonging to Ela, the foundress. Owing to the interest of the visit to Lacock, and time having slipped away, it was decided to abandon the proposed visit to Castle Combe and drive direct to Bath, which was reached about 6.45. At the evening meeting a paper was read by the Rev. Dr. Astley, in the absence of the author, Mr. Giheme Sieveking, upon "The Rise of the Woolen Industry."

West of England Roof-Screens.

A paper was also read on "West of England Roof-Screens," illustrated by lantern views, by Mr. F. Bligh Bond, F.R.I.B.A. Mr. Bond explained that the English Church from the earliest times had scrupulously preserved the division between nave and chancel. In the West of England, however, they found no true screen-work until the XIVth century, and of that period there was but very little extant. The reason was that in the XVth century so many churches were rebuilt, when almost all the old screen-work was swept away to make room for the work of the latter date. Amongst the many beautiful screens shown was that at Nunney Church, near Frome. A few years ago the Somerset Archaeological Society visited the church, but found the screen had been removed. It was found in a furniture dealer's shop awaiting sale, but, a strong protest by the Society resulted in its restitution to the church. Most of the screens in this part of the country are of wood, very few being of stone. Some eighty or ninety views illustrated the paper.

Bitton Church.

Thursday.—Rain set in in the early morning and was falling fast when the members of the Congress set out, about 10 o'clock, in closed carriages for Bitton, Syston, Pucklechurch, and Dyrham. Fortunately on reaching Bitton about 11 o'clock the weather cleared, and the afterpart of the day was very pleasant. At Bitton the Rev. Canon E. T. Ellacombe, M.A., received the party, and gave an interesting account of the church and the Manor. At the period of the survey in 1086 the Manor belonged to a Saxon Thane named Duns, who, previously to the Conquest, held this and other manors in Stoke, Rockhampton, and Brimsfield. He was, however, obliged to give them up to William. The church of Bitton held one hide of land in the parish and a prebendal stall in Salisbury Cathedral. The church, dedicated to St. Mary, consists of a nave, chancel, and western tower, with porch and north aisle. There appear to be some remains of a pre-conquest church built into the north wall near the east end. The nave is very long and of early XIth century date, with north and south doors of the same period. The chancel and west tower are of the XIVth century, 1370 to 1380. The Pope granted thirty days' indulgence to every one subscribing towards the building of the tower. On the north side is a chantry dedicated to St. Catherine, the consecration deed of which is dated 1299. Over the chancel arch on the east side are indications of an early rood. There are some good monuments.

Churches of Syston and Pucklechurch.

A drive of about three-quarters of an hour brought the party to Syston, where the church, dedicated to St. Anne, was visited. It is a small church with a Norman nave, an early English chancel and a western tower. The south doorway is particularly interesting and is richly carved. It is of the XIIth century, having a tympanum on which there is carved the tree of life, with mouldings of the cable, zigzag, and circle patterns. The capitals of the shafts have fluted ornament. A leaden font of transition Norman design, bearing figures of Apostles, alternately with scroll-work, beneath semi-circular arches and richly-ornamented, is a feature of great interest. Syston Court was next visited, by the kind permission of the owner, Mr. J. E. Rawlings. It is a Tudor House, said to have been built by a member of the Dennis family. It closely adjoins the church.

The drive was then resumed to Pucklechurch for luncheon, after which the Parish Church was inspected. The Rev. S. G. Gilham, M.A., gave a description of the building. Mr. Patrick, hon. sec., also read some notes on the architecture and monuments. Professor J. P. Hamelin, who attended the Congress as a delegate of the Société D'Archéologie de Bruxelles, drew some interesting comparisons between the flowing lines of the late decorated tracery of the windows and tombs in the north aisle, and the flamboyant style of the continent, and considered that French influence was exhibited in these beautiful monuments.

Dyrham Church and House.

From Pucklechurch the drive was continued to Dyrham, where, at the church, the Rector, the Rev. W. T. Blathwayt, M.A., received the members, and his son, the Rev. W. E. Blathwayt, read a short paper on its history. Dyrham is celebrated in English history for the great battle fought there in 577, by Ceawlin and Guthune, in which they completely defeated the Britons and captured Gloucester, Cirencester, and Bath. The church is dedicated to St. Peter, and was erected in the XIIIth century, but was largely added to during the XIVth century. Later a chantry chapel was added for a Guild, founded in 1520 by Sir William Dennis and his wife Anne. There is a life-size splendid brass on the floor of the chapel to the memory of Sir Morys Russell and his wife Isabel; it is a well-known example. The pulpit is a good elaborate sounding-board work, and has an elaborate party proceeded to Dyrham Park, the mansion closely adjoining the church. The house is of two dates, Tudor and late XVIIth century. It was the home of the Denrises, but was much enlarged by William Blathwayt, who was Secretary of State to William III. It was completed in 1698. The house contains a fine collection of paintings, mostly of the old Dutch school, Dutch picture-books, and old Delft pottery.

Leaving Dyrham about 5.45, Bath was reached about 7 o'clock.

The Saxon Church at Bradford-on-Avon.

After dinner the evening meeting was held in the drawing-room, when the Rev. Dr. A. J. D. Astley read a paper upon "The Saxon Church at Bradford-on-Avon." As the members had spent considerable time in the examination of the building on Tuesday, Dr. Astley omitted the actual description of the church, and confined himself to dealing with the controversial question whether the present building is the original Saxon Church of the VIIIth century, or whether it is a restoration of that building dating from 950 to 1000. He was in favour of the latter theory, and Mr. Wigfull, of Sheffield, was inclined to the same opinion. Dr. Birch, however, was emphatically of the contrary opinion. Mr. Patrick also was disposed to agree with the earlier theory, but disclaimed any special study of the subject.

Friday, August 12.

This morning the members of the Congress had to make an early start, leaving Bath from the Midland Station at 8.55, for Glastonbury and Wells. Arriving at the former place, after nearly two hours' travelling, they proceeded, under the guidance of the Rev. Prebendary Grant, M.A., to inspect the ruins of the famous Abbey, the Abbot's kitchen, the Abbey Barn, and the celebrated Museum.

Glastonbury Abbey.

At the Abbey, Prebendary Grant gave a history of the foundation of the Benedictine Monastery, and of the earlier buildings which occupied the site of the beautiful Lady Chapel, and described the meaning of the carvings on the north and south porches. Mr. Patrick, hon. sec., then described the plan, and pointed out the architectural features of the remains of the Abbey, and explained the construction of the western Galilee in the XIIIth century, by which the Lady Chapel, which originally was quite an isolated building, occupying the site upon which the earliest wicker church was erected, was united to the Abbey church, the latter being approached by a broad flight of steps from the lower level of the Lady Chapel. Glastonbury Abbey is so well known, and has been illustrated in the "Builder, Abbey Series," that further description is unnecessary here. A visit was subsequently paid to the well-appointed Museum, where the relics discovered in the lake village were fully described by Prebendary Grant. After luncheon, carriages were taken for Wells, and the Cathedral, Bishop's Palace, Vear's Close, etc., were visited. Indisposition unfortunately prevented the Rev. Canon Church from meeting the members and describing the Cathedral, as had been hoped for and arranged, to the great regret of the meeting. A smart drive had to be made to Masbury Station to catch the 5.8 train to Bath. In the evening, at 8.30, the Rev. C. W. Shickle, M.A., F.S.A., the President of the Bath Natural History and Antiquarian Field Club, gave a reception at the Art Gallery in honour of the Association, which was largely attended. In the course of the evening Mr. Shickle read a paper dealing with the "City Chamberlain's Accounts." He had gone very thoroughly into the investigation of the ancient documents, consisting of over 100 rolls, some of which were very difficult to decipher. They related to almost everything which could be thought of in connexion with the city, and covered the period from 1569 to 1725—a long and important period of English history. Mr. Shickle quoted numerous extracts from the accounts, many very curious, and mentioned that he intended to send a copy to the British Museum. Mr. Sydenham also read a paper on the "Hot Springs of Bath." In the library were exhibited by the Town Clerk some of the more interesting and valuable of the City Charters, which were described and commented upon by Dr. W. de Gray Birch, F.S.A., Hon. Treasurer of the Association.

Saturday, August 13.

It was intended to have completed the week's programme by a morning drive to some of the antiquities in the suburbs of Bath to-day, but, as so many members were leaving for London and other places, the excursion was abandoned, and the closing meeting was held in the drawing-room of the hotel, when votes of thanks to the Mayor and Corporation and the local hon. secs., and those who had assisted to make the Congress successful, were passed with acclamation, and the meeting separated.

Illustrations.

ST. GEORGES DE BOSCHERVILLE.



ABOUT eight miles west of Rouen by road, on a peninsula formed by bonds of the Seine, and rather more than a mile from the river, is the Abbey of St. Georges de Boscherville, now consisting of little more than the church and chapter-house. The village church is dedicated to St. Martin de Boscherville, and may have been founded by some Frankish Balcher or Baucher on his *villa* or estate. The abbey, however, grew out of a little chapel dedicated to St. George, and was founded by Radulphus or Raoul de Tancarville, the Grand Chamberlain of William the Bastard. The charter of foundation cites William as Duke of Normandy, and also mentions Matilda, which would place it after 1053, when he married Matilda, and before 1066, when he became King of England. The canons, however, were already in possession when the deed was drawn up; and the building of their monastery, therefore, may have begun as early as 1050, or thereabouts. At first the abbey church was served by Augustinian canons; but these were replaced by Benedictine monks in 1114, as happened in many churches both in Normandy and England about this period. Till the extinction of that great family in 1305, the abbey was the special care of the Tancarvilles, receiving from them large endowments; near its high altar all, or nearly all of them were buried. The estates of the Tancarvilles passed to the Meluns; then to the Harcourts; then to the Orléans-Louguevilles; all of whom kept up the intimate relation between the estates and the abbey. So that, though a great abbey church, it was, like our own Tewkesbury abbey, to a large extent always a family chapel. The number of monks seems at no time to have been very large; the establishment was by no means on the scale of the neighbouring abbeys of St. Wandrille, Jumièges, and St. Ouen, Rouen. In the XIIIth century there were only twenty monks; in the XIVth century there were from ten to fifteen; in the middle of the XVth century there were but eight; in 1790 there were but seven. Outside Normandy St. Georges possessed three priories or manors, Avesbury, Winterborne, and Weston or Edwiston, all in England. In 1390 the abbey sold the only one left, Edwiston, to the priory of St. Anne of Coventry for 100 gold florins; alien priories in England were a dangerous form of investment in those days. In Normandy the abbey had eight priories; it also had the patronage of thirty churches. Though never among the richest of the abbeys, it steadily gained in wealth, till under Francis the First there came in the system of appointing abbots *in commendam*, hardly ever Benedictines, but secular priests, very often non-resident. Among these may be mentioned two of the Cardinals d'Este, one Archbishop of Lyons, the other of Auch. The result was disastrous to the abbey; at the beginning of the XVIIIth century the abbot appropriated from 20,000 to 25,000 livres of its income, leaving only 10,000 livres to the abbey. At the Revolution the abbey had an income of over 20,000 livres; the abbot had 40,000. Like most of France, too, the abbey suffered greatly from the religious wars. In 1562 it was sacked by the Huguenots, and all the accessories of worship were destroyed. This was repeated in 1570. In 1590 the abbot's hall was burnt down, and much damage was done also to the church, which remained unrestored for many years. The XVIIIth century was marked by a great reform of the Benedictine Order throughout France; at St. Georges the claustral buildings, with the exception of the chapter-house, seem to have been wholly rebuilt, and the damage to the church to have been made good in this and the following century; to this work belongs the considerable repairs on the south side of the nave done in the style of the XVIIIth century. At the Revolution the monastery and the church were offered separately for sale. The village, which originally had centred round the old parish church of St. Martin, had long ago drifted away to the neighbourhood of the abbey; the parish church was out of repair; so the abbey church was bought for 10,000 francs to serve as parish church, which it does to this day, after the manner of our Benedictine abbey churches of Tewkesbury, Sherborne, and Selby. In 1822 the Norman archaeologists succeeded in saving the chapter-house also, with the aid of a grant

of 3,000 francs from the Ministry of the Interior.

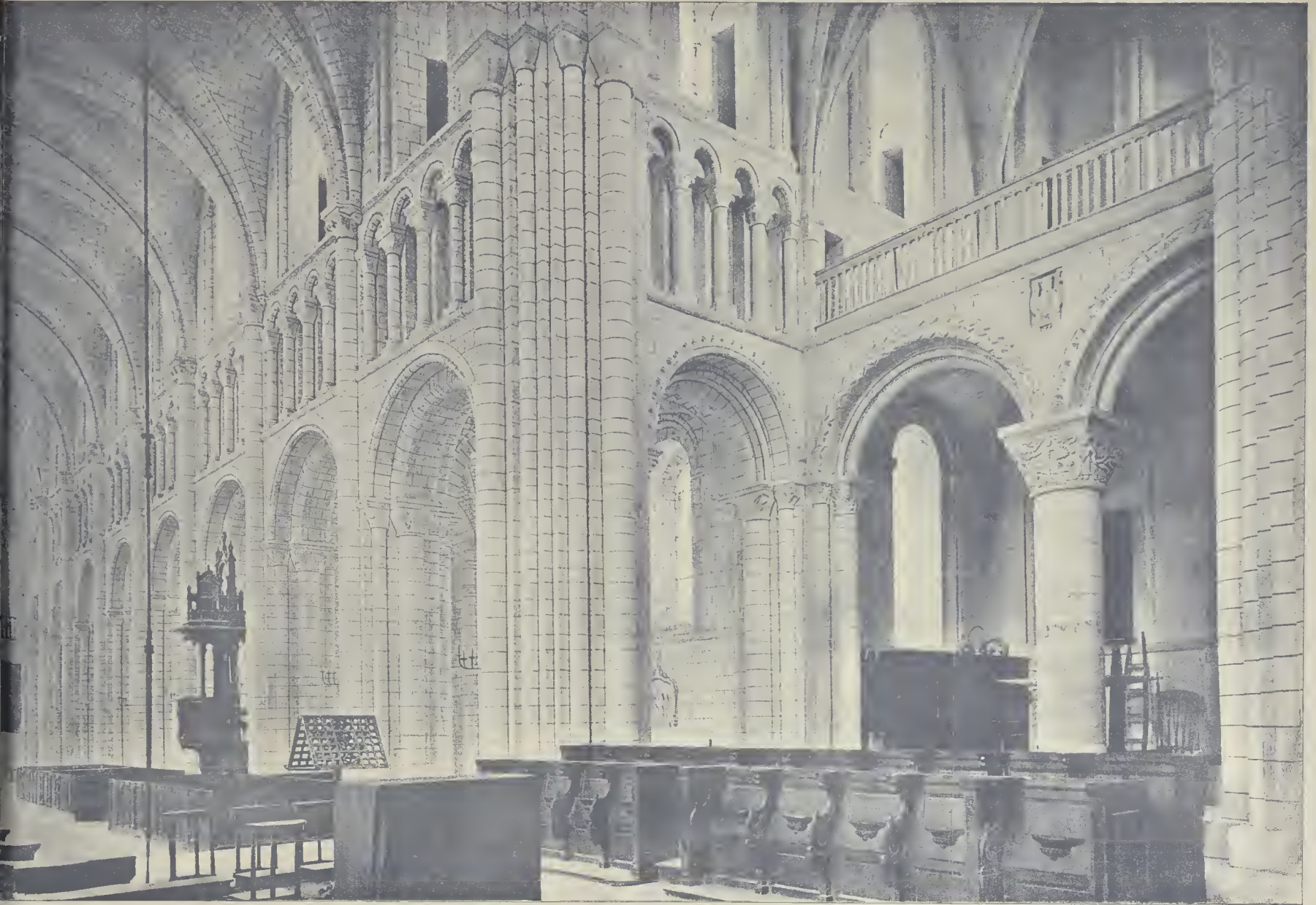
St. Georges de Boscherville is one of the largest Romanesque churches in Upper Normandy, the best preserved, and the least altered. The chapter-house was built by Abbot Victor, probably in the last quarter of the XIIIth century; the high vaults of the nave and transepts, and the upper parts of the western towers with their stone spires, were built about the middle of the XIIIth century, the central spire of wood is a later work, damage done to the north side of the nave was repaired late in the XIVth or early in the following century; and damage to the south side was repaired in the XVth century. Otherwise the church is wholly Romanesque. The result is that it presents homogeneity and uniformity of design which, exceedingly striking. From eastern aspect the western front there is hardly the slightest change in design; the whole church would seem to have been built without break or interruption and with extreme rapidity. Internal measurements of the church are 66 metres 30 long; with a transept 31 metres 44 long; the nave is 38 x 13 metres 31 long, 8 metres 20 broad, and 15 metres 77 high; the walls are 1 mètre 75 thick. On plan it is an aisled nave of eight bays; transepts of 6 bays, each with a semicircular eastern apse; the aisled choir contains eastward in a semicircular apse, which externally is rectangular, as at St. Nicholas, Caen, Lessay, St. Gabriel, Bernay, Longueville, Roncesay, and Durham. East of the two bays of the choir is a narrow bay covered with a barrel vault; east of this again is a semicircular apse of five bays covered with a ribbed semi-dome. Each transept has a return gallery; that of the north transept is shown in the illustration. These return galleries occurred also at St. Stephen at St. Nicholas, Caen, Jumièges, Corisy, St. Taurin, Evreux, St. Serain, Toulon, Preuil, Sen-Claire, Winchester, and originally at St. Ouen, Rouen and Ely. In Gothic work this occurred at Nôtre Dame, Eu, Laon, and Lincoln. The vaults belong to two periods. Those contemporaneous with the building of the church are those of the aisles of the nave and choir, and below the transeptal galleries; also the high vaults of the choir; all the above are groined, i.e., unribbed; to the same work belongs the barrel vault east of the choir, and probably the ribbed semi-domes of the main apse, and of the transeptal apses. It is true that in the main apse the semi-dome is entirely independent of its ribs, which spring from short, stout columns between which and the wall there is a thoroughfare passage round the apse. But the moulding of these ribs are to be paralleled in parts of the church which are undoubtedly Romanesque. To the second period belong the high vaults of the nave and transepts and crossing. These are quadripartite, except that the crossing, like that of Amiens, which can be but little earlier in date, has also ridge-ribs; and that one supplementary rib occurs above the transeptal galleries, and two in the most western bay of the nave.

There is a single central doorway of great beauty in the west front; and smaller doorway in the most eastern and most western bays of the nave, both on the north and south sides. The cloister was north of the nave. There was no passage or slype between the north transept and the chapter-house. The latter is oblong; most monastic chapter-houses were divided into two or three naves by a row or rows of pillars; but that of St. Georges had no pillars. This seems to be a peculiarity of the Romanesque of Normandy, e.g., Jumièges, and Ronen Cathedral. The chapter-house is an exquisite example of the Gothic of Normandy as contrasted with that of the Ile de France.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.

AS USUAL, we illustrate by sketches some of those places of interest which the Architectural Association excursion are visiting this week. Some of them are referred to in another column dealing with the excursion. An account of the last days of the excursion and other sketches of places visited will appear in our issue next week.

CONGREGATIONAL CHURCH, EPSOM.—In our last issue, under the heading "General Building News," we stated that the architects of the New Congregational Church at Epsom were Messrs. Gregg and Stapley. It should have been "Gregg and Stapley."



ST GEORGES DE BOSCHERVILLE: NAVE, LOOKING WEST.

INK PHOTO, SPRAGUE & CO. 4 & 5 EAST HANING STREET FETTER LANE E.C.

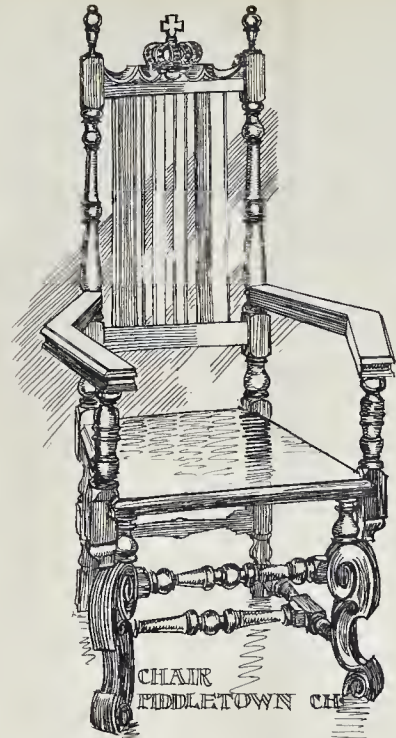




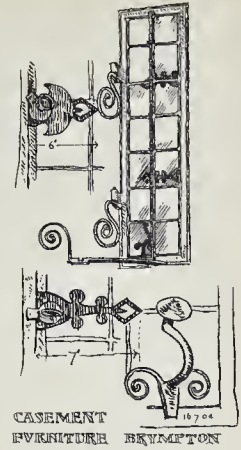
LECTERN BRYMPTON CHURCH



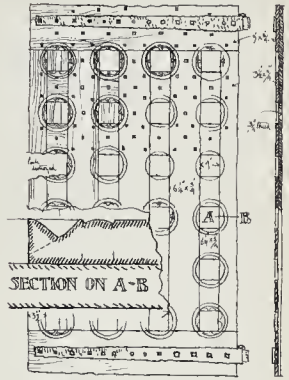
CHANDELIER FIDDLETOWN CHURCH.



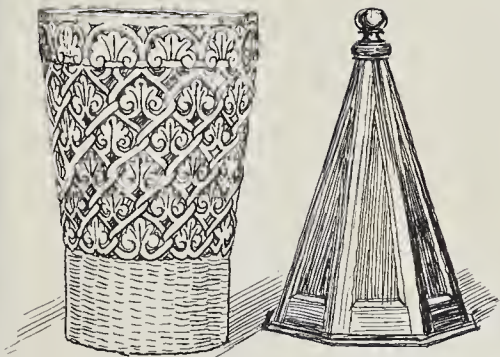
CHAIR FIDDLETOWN CHURCH



CASEMENT FURNITURE BRYMPTON



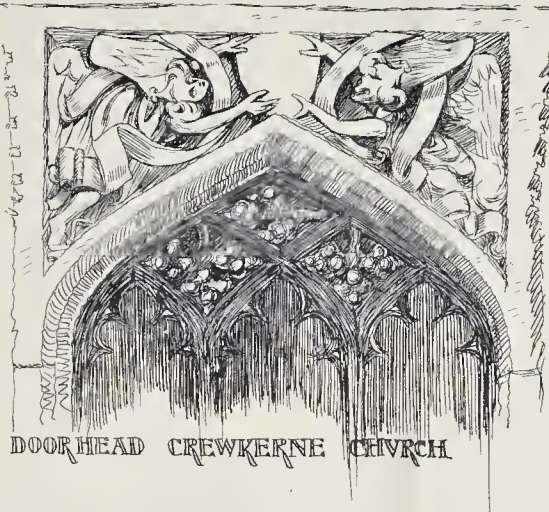
SECTION ON A-B DOOR AT CLIFTON MAYBANK



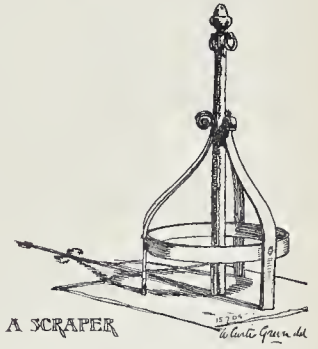
FONT AND COVER FIDDLETOWN CHURCH



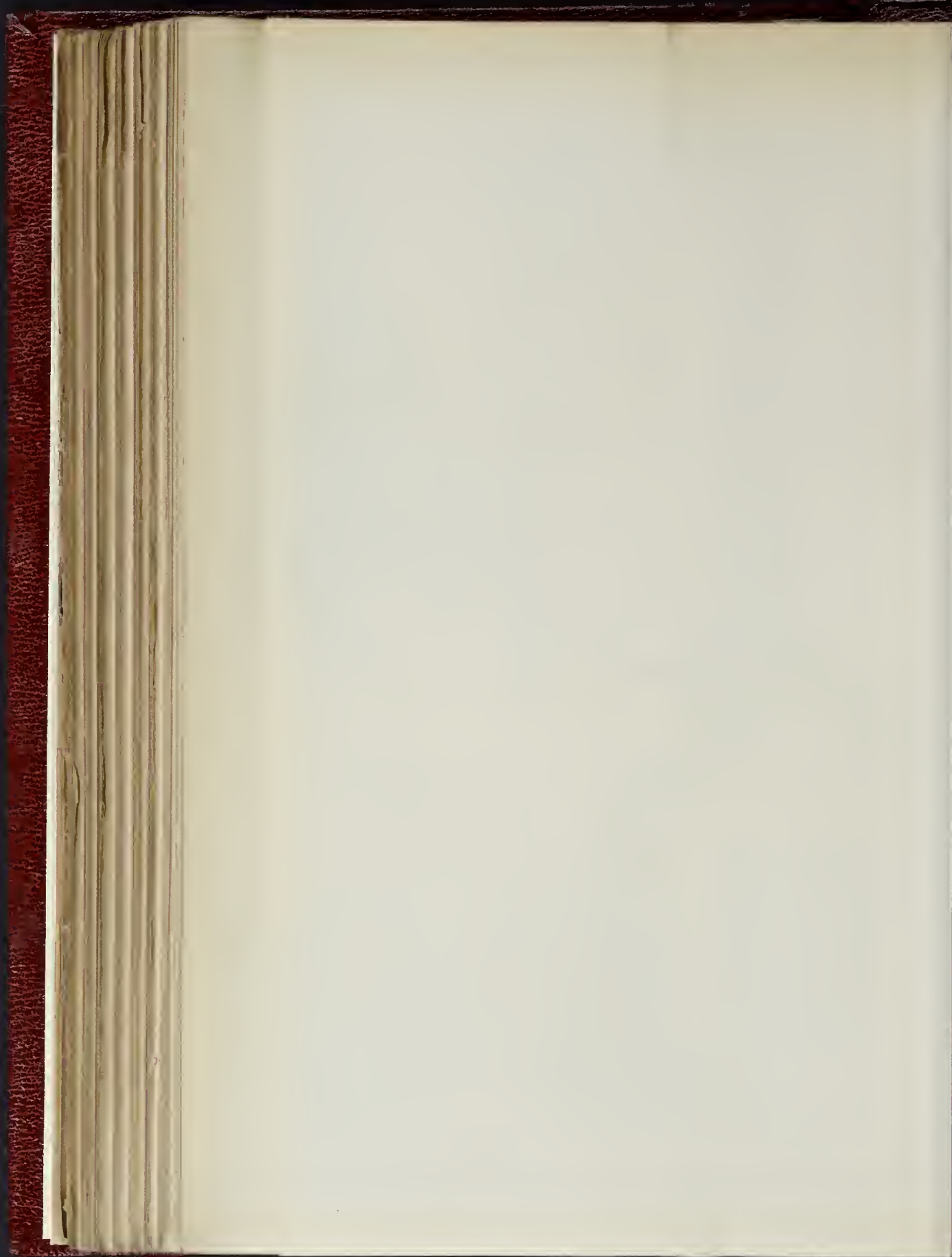
PEW END NORTH CADBURY



DOOR HEAD CREWKERNE CHURCH



A SCRAPER

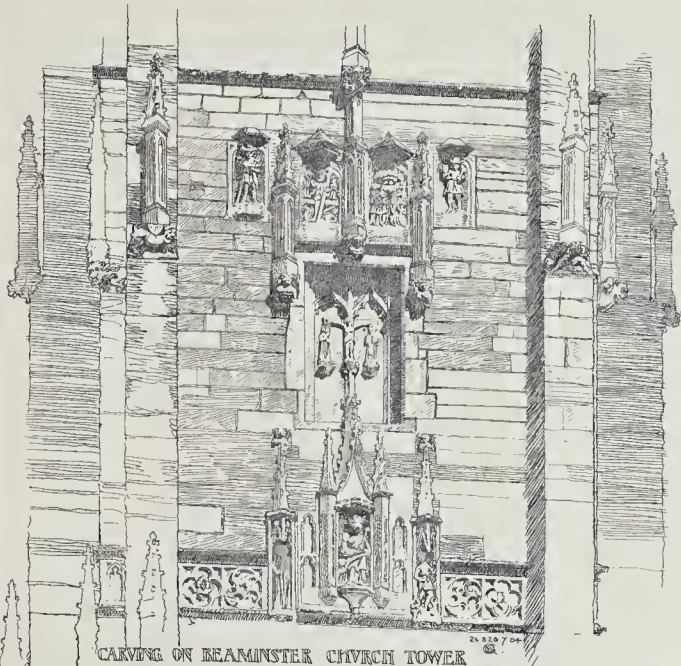




PART OF THE FRONT OF MAPPERTON HOUSE



CADEVRY COURT

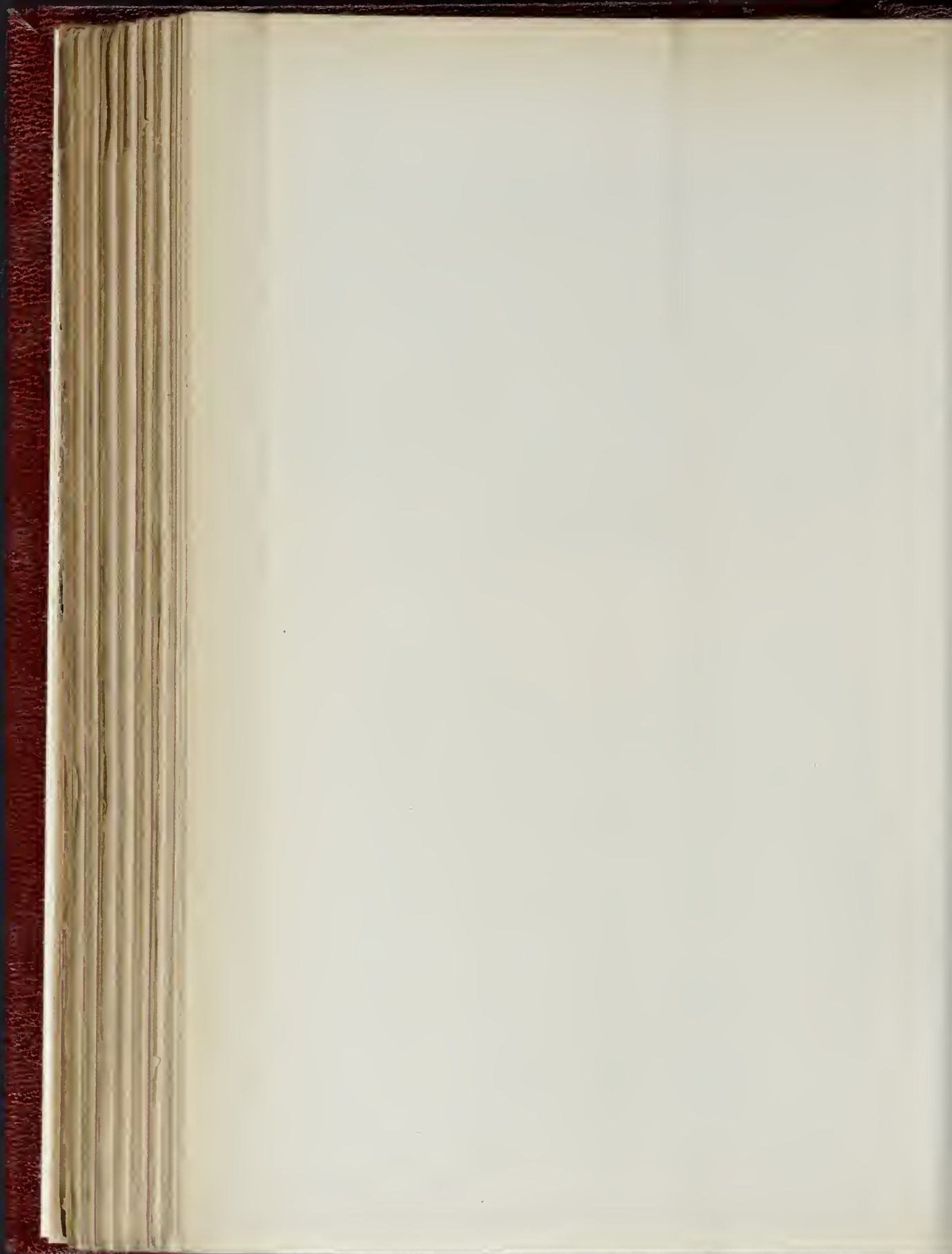


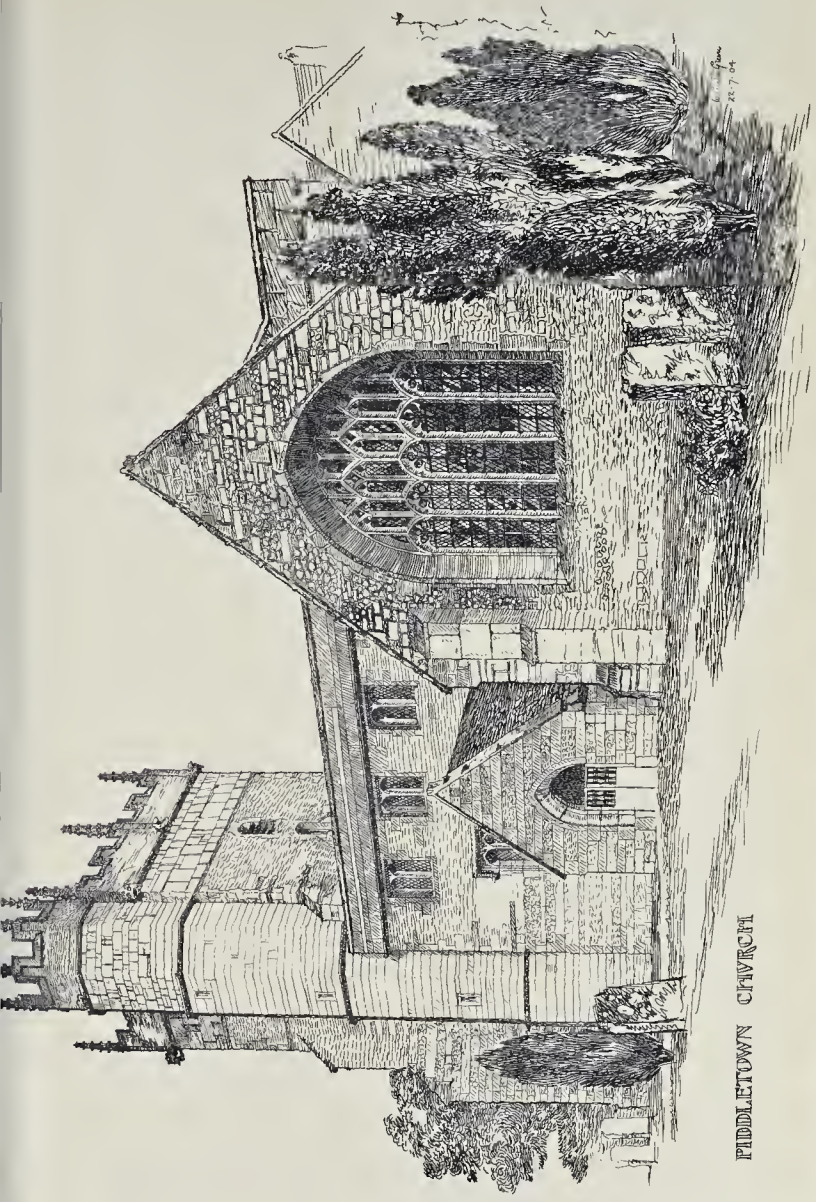
CARVING ON BEAMINSTER CHURCH TOWER



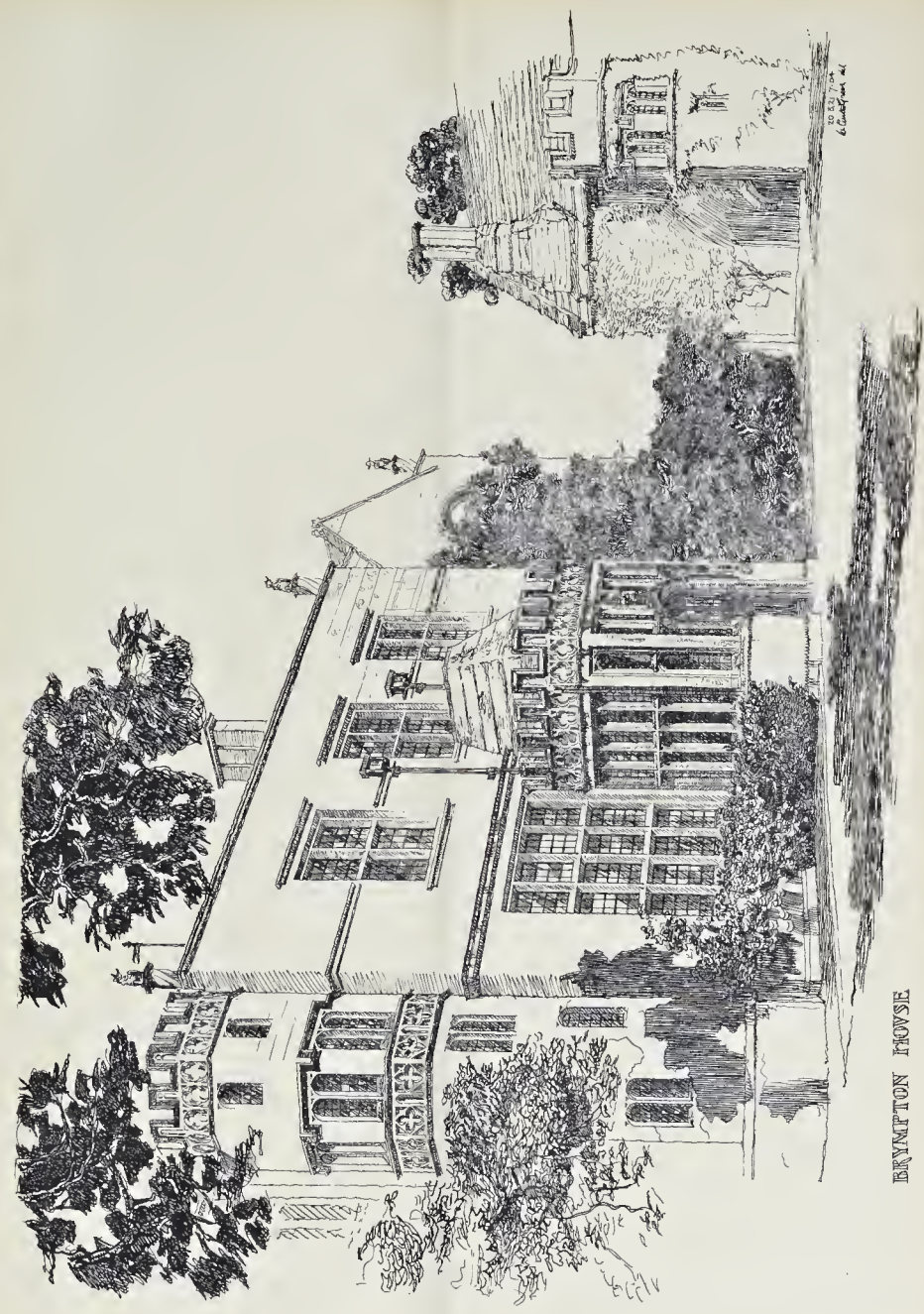
NORTH CADEVRY CHURCH

PHOTO LITHO SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



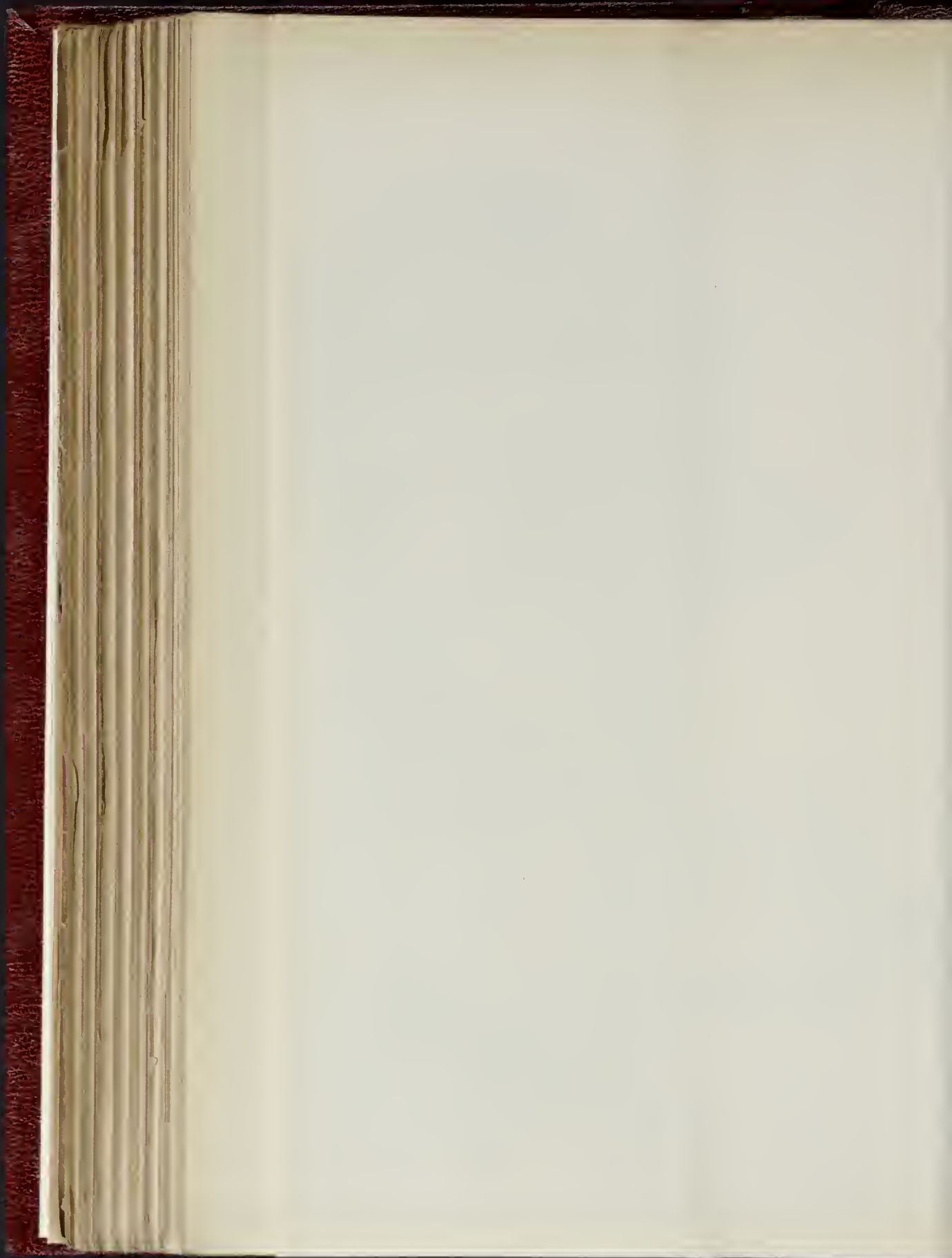


FIDDLETOWN CHURCH



BRYNTHON HOUSE

PHOTO. J. H. SPAGUE & CO. 45 & 47 EAST HADSON STREET, NEW YORK, N. Y.



STANDARDS OF PURITY FOR SEWAGE EFFLUENTS.*

"At first sight it does not appear to be so very difficult to decide whether a certain sewage or effluent is in such condition that it might safely be let into the river. What we aim at is, that the beds and banks of our rivers are kept free from foul sediments; that the water of our public water courses does not become turbid, discoloured, and foul, and that such water sustains fish life.

In some cases other requirements must be enforced; for instance, sometimes it is essential to maintain the river water in a condition suitable for utilisation for domestic supply; sometimes factories discharge only their refuse water into the river, others utilise the river water for manufacturing purposes, and require that not too much condenser or other hot waste water is discharged into the river, and also that the river water remains soft, and is not spoiled for their purposes by admixture with injurious chemicals.

It is not necessary in all cases to fulfil every one of the requirements. Often only one or two of them must be considered. The greatest difficulty to our question arises from the variability of the proportion between the quantity of sewage to that of river water, into which the former can be discharged. In one case we can let crude sewage into a stream without having to fear that the slightest detectable alteration of the river water will result. In other cases offensive changes of the river water can only be avoided by purifying the sewage very thoroughly before discharging it into the river. These facts show the hopelessness of all endeavours to find one standard which would suffice for all cases.

As long as we do not drop the idea that the admissibility of crude sewage or effluents into rivers might be judged by standards based exclusively on the chemical or physical nature of the sewage or effluent, we can never hope to come to decisions that are just and rational. The only possibility in this line would, according to my idea, be to succeed in finding a series of standards permitting us to individualise and to arrange matters so as to allow us easily to determine the standards best adapted to the local conditions of every single case. In fact, things will never work satisfactorily if bureaucrats are allowed rigidly to enforce one single or set of standards for all cases. We shall therefore be the expert in every single case. It would, indeed, be a mistake to search for a reaction that would enable us in one and all cases to affirm whether a certain sewage or effluent is fit to be discharged into the river or not. Such a reaction indicating whether the effluents are sufficiently free from albuminous substances, or from certain products formed in the decomposition of proteins, could come in question in such case only where a thorough purification of sewage seems necessary.

It is not my intention to formulate definite propositions as to how many standards or classes of requirements would seem necessary, and which requirements ought to be made for the different standards or classes. I shall limit myself to the discussion of one question of fundamental importance, namely—Does that we know of sewage analysis to-day put us in a position to judge from the results of chemical investigation whether a certain sewage or effluent tends to undergo putrefaction or not? Of course there are cases where the substance does not so much consist in putrefaction, but where the waste water contains organic poisonous substances or chemicals influencing detrimentally the physical qualities of the water, or where coal dust or other mining refuse destroys the appearance of the rivers, but such difficulties only arise in certain relatively small districts. Town sewage, or suchactory waste waters that contain putrescible matter, are of far greater general importance. At any rate, I shall have to limit myself to a discussion of these to-day. Therefore, I modify my question as follows:—

Are we enabled to judge by the results of chemical analysis whether a certain sewage effluent tends to putrefy?

To this end several methods have been suggested, all of which were intended to give formation as to the amount of putrescible substances contained in a certain sample, or a long time extensive use has been made

of the oxygen absorption test. This method is founded on the observation that organic substances have a great affinity to oxygen. Here, in Britain, the albuminoid ammonia test is largely used. In Germany the determination of organic nitrogen is preferred, as it is believed to give more accurate results than the albuminoid test. Lately J. König has recommended an improved method for the determination of organic carbon, which is said to indicate also those putrescible organic substances which, being more resistant to decomposition, are not indicated by the methods mentioned before.

Still, not one of these methods can be expected to give perfectly accurate results. For the requirements of ordinary practice such exactness cannot be expected, nor is it necessary, since sewage—either domestic sewage or trade refuse—contains the most heterogeneous substances in quantities varying from minute to minute. The question, therefore, seems justified, whether the more simple methods would not suffice in common practice as well as the more complicated ones. Further on I hope to convince you that this really is the case.

Not long ago it was quite common to ignite the solid matter, and to reckon the loss of ignition as organic matter. Even nowadays we find reports based on this method of the determination of organic matter. Evidently, we cannot expect to get reliable results with regard to the amount of organic matter contained in sewage by this method. By ignition, ammonium salts, nitrites, nitrates, and sulphates, and eventually also alkaline chlorides, are decomposed and evaporated. The loss of weight caused by the breaking up of such inorganic matter figures as organic substances. By adding carbonate of ammonia or water containing carbonic acid these losses cannot be exactly compensated. By determining the loss of ignition, therefore, satisfactory results with regard to the amount of organic substances in sewage are not obtainable. Much less can we by this method specify the different organic substances or determine their relative quantities. Nevertheless, even this method is, as we shall see further on, not entirely useless.

The determination of oxygen absorbed is also incorrect, in so far as not only organic but also certain inorganic matter is indicated by this method. Permanganate of potash is discoloured by ferrous salts, nitrites, sulphites, sulphides, ammonia, etc. Furthermore, some organic bodies are very easily oxidised, others only after exposure to boiling point for several hours. On the other hand, the organic substances do not absorb oxygen in proportion to their molecular weight. More especially some substances most characteristic of sewage, such as uric acid, absorb very little oxygen in proportion to their weight. Lastly, the determination of oxygen absorbed is not made uniformly, but in very different ways.

It is plainly evident, therefore, that such results are not comparable. It is also clear that we cannot find out by the method in question any details as to the nature and relative quantities of the different organic substances present. Notwithstanding all these deficiencies, I shall, later on, have to attribute quite an importance to the determination of the oxygen absorbed.

The determination of albuminoid ammonia is a British method, and is, as above-mentioned, used mostly in Britain. Its chief recommendation is that by this method only the proportion of organic substances containing nitrogen is indicated, and to such substances the objectionable putrefaction is above attributed. I cannot quite agree with this last opinion. It will suffice to mention the foul odour of sulphuretted hydrogen and of some carburetted gases, as well as of some fatty acids, etc., which are formed in decomposing sewage, in order to justify my opinion that we ought not to keep in view only the determination of nitrogenous organic matter. On the other hand, the nitrogenous organic substances evolve albuminoid ammonia in varying quantities. We cannot, therefore, draw any conclusions by the results thus obtained as to the nature and relative quantities of nitrogenous organic substances.

The determination of albuminoid ammonia is also made in different ways. Some boil after addition of magnesia in order to first remove free and saline ammonia. Thus part of the albuminoid ammonia is lost. But this loss may, as you know, be avoided by making a separate determination of the free and saline

ammonia. Albuminoid ammonia is always present in very minute and variable quantities in sewage and sewage effluents. The slightest experimental error can, therefore, easily lead to differences of 100 per cent. or more in the calculation of the results.

For these and other reasons this method has not found favour in German laboratories. In Germany the determination of organic nitrogen has, as mentioned before, been preferred within recent years. This determination of organic nitrogen has also its drawbacks. By this method, too, those substances that escape by boiling with magnesia are counted as free or saline ammonia, although the free and saline ammonia figures are far higher when determined by distillation than when measured by Armstrong's colorimetric method without distillation. Moreover, this determination again only indicates nitrogenous substances, but no other putrescible matter, and, lastly, the results obtained represent only minute quantities. Aside therefrom, this really complicated method, which requires a great deal of time, leads to reliable results only in the hands of very careful chemists, especially experienced in this line of investigation. According to my idea, the determination of J. König is far more useful than any of the methods mentioned above. Still, even this method does not permit us to judge what kinds of organic bodies are present and in what proportions. But König's method requires less time, is sufficiently simple, and, what is most important, the results are determined by means of balances.

After these explanatory statements I will now return to my question, whether by chemical analysis we are enabled to decide with certainty whether a given sample of sewage or effluent is liable to putrefy or not. According to my view this question can be answered in the affirmative in all those cases where we have to do with samples containing very small quantities of organic substances, as indicated by one of the above-mentioned methods. If, for instance, in a certain sewage or effluent we find a loss of ignition amounting to not more than two or three grains per gallon, or if we obtain an oxygen absorbed figure as indicated by Kubel's method of not more than about one or two grains per gallon, or by the four hours' test an absorption of oxygen amounting to not more than one grain per gallon, or albuminoid ammonia equivalent to 0.1 grains per gallon, or organic nitrogen of approximately 0.2 grains per gallon, or organic carbon about one grain per gallon, we can almost positively say that these samples will not undergo putrefaction. Are we now to understand that every sewage or effluent that contains a quantity of organic substances more or less exceeding these figures is liable to putrefaction?

The ingenuity and infinite pains which our leading men have brought to bear on the improvement, and on raising the accuracy of the methods in question, will, according to my idea, have brought us to a satisfactory end only if from the absolute figures obtained we are enabled to say with certainty whether any given sewage or effluent is liable to undergo putrefaction or not. I am sorry to say that expectations in this direction are not justified.

In England standards have been published by some Rivers Boards according to which sewage effluents are considered bad if they contain more than 0.1 or 0.112 grains per gallon of albuminoid ammonia, or if they absorb more than 1 grain per gallon of oxygen as determined by the four hours' test.

We may safely assume that these committees have laid down such requirements because they are convinced that any sewage or effluent in which albuminoid ammonia or oxygen absorption exceeds those figures will tend to undergo putrefaction. Now it is a fact that from very concentrated sewage we are able by means of biological treatment to produce an effluent clear, limpid, colourless, and free from odour, which will under no circumstances undergo putrefaction, yet which will give far higher albuminoid ammonia figures; for instance, 0.3 or even more grains per gallon of albuminoid ammonia, or will absorb, as determined by the four hours' test, far more oxygen than is allowed by the above-mentioned standards.

I have brought with me a sample of effluent which absorbs 6.8 grains of oxygen per gallon determined by the four hours' test, that is to say, about the same amount of oxygen absorbed by the crude sewage of Manchester not freed from suspended matter by filtration. Moreover,

* Part of a paper by Prof. Dr. Dunbar (Hamburg) read before the recent Congress of the Sanitary Institute Glasgow.

you here see samples in which 0.83 or even 1.37 grains per gallon of albuminoid ammonia have been determined. That means to say several times the amount of these substances allowed by the standards in question. These samples are so clear, colourless, entirely free from stench and non-putrescible, that the commissioners would doubtless be very pleased if all effluents let into their rivers were equally good.

How are we to understand these singular facts? According to my view, it would be a mistake to think that by biological sewage purification only about three-quarters of the soluble organic matters present are entirely removed from the sewage, the remainder staying unaltered in the effluent. We have good reasons to believe that by biological treatment the entire organic matter present in crude sewage is retained and decomposed. If, therefore, a crude sewage contains, say, about 3 grains per gallon of organic nitrogen, we must not believe that about one-third of the organic substances containing nitrogen had passed the plant unaltered; but we may suppose that, with the exception of those substances unusually resistant to decomposition, and, therefore, not liable to putrefaction, all of the organic matter has been decomposed, and that those substances giving the reaction of 1 grain per gallon of organic nitrogen are entirely different substances not liable to undergo putrefaction.

The effluents from biological plants always contain substances which determined by the methods spoken of are called albuminoid ammonia, organic nitrogen, organic carbon, etc. If, for instance, the crude sewage freed from suspended matter contained 6 grains per gallon of a certain substance, we find in the effluent from a biological plant in good working order about 1.5 to 2 grains per gallon; if the crude sewage contained 4 grains per gallon of the same substance, we find in the effluent 1 to 1.5 grains per gallon, and so on in proportion to the concentration of the crude sewage.

If we make all the determinations spoken of in one effluent we generally find the percentage of reduction to be the same, or about the same, in all the different determinations. This observation was made so often and on such different sorts of sewage and effluents that Dr. Thumma and I a few years ago came to the conclusion that any one of the methods described would give almost equally reliable results as the other methods, and that, therefore, it would in general practice suffice to use the simpler methods only, as, for instance, the determination of oxygen absorbed.

But the substances indicated by our methods in the effluents are not identical with the putrescible matter contained in the organic crude sewage. These subjects certainly contain nitrogen and carbon, but they are products of decomposition fully oxidised and non-putrescible. Therefore it ought to be of very little consequence whether the effluent contains 0.1 or 0.2 grains per gallon, or even several times as much as these substances as indicated by the albuminoid ammonia test, or whether we find 1 or 2 grains per gallon of oxygen absorbed or even much larger amounts, as long as these substances are non-putrescible and not harmful to fish, even if they are placed into the concentrated, not diluted effluents. Such effluents should be considered as harmless, and we ought not, therefore, to object to their being discharged into our rivers.

In a town with a relatively low water consumption we find comparatively concentrated sewage, and, therefore, in such case the absolute quantities of organic substances contained in a gallon of effluent will be higher than in the case of a town showing a larger consumption of water, and yet the effluent in the former case may be equally fit to be discharged into the river.

This sample, for instance, is an effluent derived from town sewage treated biologically. Ought this effluent, looking nearly as clear and limpid as pure well water and being absolutely free from any offensive smell, and entirely non-putrescible, to be considered bad, and not fit to be discharged into a river because it absorbs 2.18 grains of oxygen per gallon determined by the four hours' test?

We come, as I have explained, to similar results by the determination of albuminoid ammonia and of organic carbon. An excellent effluent may occasionally give figures by far exceeding those of a turbid, discoloured, crude sewage tending to undergo putrefaction.

Every attempt to formulate standards, based on absolute figures, must appear hopeless in the face of these results which I have just laid before you, and which are only extracts from a great number of analyses at my disposal all tending to prove the same.

Although I admit that the standards mentioned before may suffice in the case of certain cities, it would, to my idea, be a grievous mistake to generalise them. In many cases the effluents will just about not putrefy if they contain 0.1 grains per gallon of albuminoid ammonia, or if they absorb 1 grain of oxygen per gallon. But in many cases we can only get satisfactory information as to the putrescibility of the effluents if we also know the nature of the crude sewage.

With a moderate degree of certainty we can by the appearance and smell of an effluent tell whether it will putrefy or not. But it must be admitted that this physical method of examination is not sufficient for all cases, and that even the judgment of a well-practised observer may be impaired by a cold or other indispositions.

The effluents when kept in a room in firmly-stoppered bottles for several days will, if not thoroughly purified, develop a smell of sulphuretted hydrogen, and this can hardly escape our sense of smell, even in quantities far too small to be detected by chemical analysis. This method of examination, although leaving nothing to be desired as to its simplicity and reliability, is yet one of those subjective ones which we want to avoid, and, besides that, it does not allow us to form a judgment before the lapse of several days. Now, in nearly all cases it is most desirable that the efficiency of a purifying plant can be ascertained at any time and at once.

A few years ago I observed when examining, together with Dr. Thumma, the effluents of biological purification works, that when either the oxygen absorption—determined by Kubel's method—or the loss on ignition, or the organic nitrogen showed a reduction of at least 60-65 per cent. in the effluent as compared with the crude sewage freed from suspended matter, these effluents were not putrescible. Since then I have made similar observations in regard to the reduction of organic carbon. I am not going to advance the statement that this ratio holds good for every sewage and every biological system. Still, we have as yet regularly found it confirmed in every domestic and town sewage as well as in different trade wastes. I am, therefore, inclined to hope that whereas absolute figures appear to be useless for our purpose, the percentage ratio between an effluent and the corresponding crude sewage may enable us directly to judge as to the putrescibility of that effluent. Fortunately we can in this case do without the above-mentioned complex methods, as the determination of oxygen absorbed gives us sufficiently reliable results.

Every one of the above-mentioned modifications of the determination of oxygen absorbed gives satisfactory results, if used for such calculation only. Of course it is necessary always to examine the crude sewage and the effluent both in exactly the same manner. Moreover, the above statements hold good only for sewage that has been freed from suspended matter. When examining the crude sewage unfiltered—as is usually done when making the four hours' test—the reduction is often found to amount to about 10 per cent. more than when comparing filtered crude sewage with filtered effluents.

To my view, the examination of unfiltered samples is far more open to objection than the examination of filtered samples. The suspended matter in effluents of biological purification-plants is of an entirely different nature to that found in sewage. The former consists of, to a large extent, animal and vegetable organisms grown in the filter-beds, and which should be regarded from quite a different point of view than the suspended matter in crude sewage.

The determination of oxygen absorbed is the simplest of all methods in question, and if Kubel's modification is employed the results can be at hand within very few minutes. These, I think, are great inducements to the use of this test. Concluding, I should like to state that, according to my opinion, we can judge the putrescibility of effluents better by the percentage of reductions effected by biological plants than by standards based on absolute figures.

The absolute figures obtained even by the best methods of determining putrescible matter in sewage do not in all cases give definite indications as to the putrescibility of any given sample. Effluents of purification works may present a most satisfactory character, and yet under certain circumstances contain as large or even larger quantities of either organic carbon, organic nitrogen, and albuminoid ammonia; as high an oxygen absorption, and loss of ignition as other samples of crudesewage which are in a high degree liable to undergo putrefaction. We should, therefore, give up the attempt to find a standard of general applicability based on absolute figures.

A far safer judgment as to the putrescibility of effluents can be obtained by calculating the percentage of purification effected. Simple methods like Kubel's oxygen absorption test give results entirely sufficient for wants of practice, if used only for calculating the percentage of reduction. The analytical determinations spoken of are not needed in all cases. The requirement that all effluents should be absolutely non-putrescible needs only to be made where the river presents most unfavourable conditions, or where the river districts are densely populated. In many cases it will be sufficient to require only that all coarser suspended matter be removed from the sewage. In other instances all suspended matter, including finer particles, should be removed as efficiently as possible. In other cases, again, the authorities will have to insist not only on the removal of the entire suspended matter, but also on a reduction of between 40 and 50 per cent. of oxygen absorbed by the dissolved impurities, the determination being made after filtering the samples; and there will certainly be such cases, too, where it must be stipulated that the effluents are limpid and entirely non-putrescible.

It would be desirable that leading men in Britain and Germany, where the great questions of rivers pollution and sewage purification are at present being discussed more than ever before, should come to an understanding to carry out the examination of sewage on the same lines. In such case the large amount of analytical work carried out in both countries every day would lead to comparable results, and progress might be accelerated by mutual labour and interchange of ideas.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

At the meeting of the Building Act Committee of the London County Council, held on July 25, being the day before the Council adjourned for the Summer Recess, the proceedings were governed by the clause in the order of reference which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the Committee's order of reference. The names of applicants are given in parentheses:—

Lines of Frontage and Projections.

Wandsworth.—Bringing forward the frontage of six houses on the north side of Rose-dale-road, Herne-hill, between No. 1, Park-villas and Guernsey-grove (Mr. P. C. Davies for Messrs. R. Parry, H. Eabor, and F. J. Chapman).—Consent.

Hampstead.—The erection of one-storey buildings on the east side of West-end-lane, Hampstead, northward of "Tower Mansions" (Mr. A. Whitlaw for the London and North-Western Railway Company).—Consent.

Levensham.—Twelve houses on the northern side of Rutland-road, Perry-hill, Catford (Mr. W. C. Poole for Mr. J. Johnson).—Consent.

Clapham.—Buildings on a site abutting upon the south side of Clapham Park-road and the east side of Park-hill, Clapham (Metropolitan Borough of Wandsworth).—Consent.

Battersea.—A pumping station on a site abutting upon the east side of York-road at the north side of Creek-street, Battersea (Mr. M. Fitzmaurice for the Main Drainage Committee of the Council).—Consent.

Hampstead.—A porch at a house in course of erection on the east side of Finchley-road, Hampstead, northward of "St. Hilda" (Mr. A. O. Breeds for Mr. C. Tavener).—Consent.

Kensington, South.—The retention of illuminated sign at the "Kensington Army public house, Warwick-road, Kensington" (Mr. T. H. Smith for Mr. A. N. Foley).—Consent.

Marylebone, East.—Balconies in front Nos. 2, 3, 4, and 5, Duke-street, Portlanoth-place, St. Marylebone (Messrs. Boehmer & Gibbs for Messrs. Matthews, Rogers, and Co.).—Consent.

Islington, East.—A warehouse building at the rear of No. 32, Newington-green, Islington, to abut upon Matthias-road (Mr. J. H. Storror for Mr. C. Fell).—Consent.

Hackney, South.—An addition to a warehouse building at No. 17, Sutton-place, Hackney, abutting upon Urswick-road (Mr. J. Hamilton for Mr. T. C. Wootton).—Refused.

Kennington.—Buildings on a site on the southern side of Wandsworth-road and the eastern side of Southville, Kennington (Mr. I. Bignold for Mr. O. Camburn).—Refused.

Lewisham.—The retention and completion of a porch and coal cellar at No. 165, Wellmeadow-road, Lewisham, abutting upon Downhill-road (Mr. E. J. W. Hider for Mr. V. Taylor).—Refused.

Lewisham.—An addition at the rear of No. 7, London-road, Forest-hill, to abut upon Queen's-road (Messrs. Dorrell Brothers for Mr. A. J. Dorrell).—Refused.

Marylebone, East.—A one-story lavatory at No. 62, Portland-place, St. Marylebone, to abut upon Weymouth-street (Mr. H. Lake for Mr. W. Tobb).—Refused.

Strand.—Two projecting signs in front of No. 25, Charing-cross, Strand (Mr. J. N. Taylor for the Great Western Railway Company).—Refused.

Wandsworth.—A bay window and wood cornice and pediment at No. 134, Devonshire-road, Balham (Mr. N. H. Meyrick for Mr. V. Scott).—Refused.

Woolwich.—A verandah and the use of half timber work at a building on a site situated between Nos. 194 and 220, Plumstead-common-road, Plumstead (Mr. F. Bethell for the Royal Arsenal Co-operative Society, Ltd.).—Refused.

Width of Way.

Hampstead.—An addition to Christchurch cottage, Christchurch-passage, New-end, Hampstead, with the boundary fence at less than the prescribed distance from the centre of the roadway of the street (Mr. J. D. Hunter for Mr. E. A. Rusher).—Consent.

Hampstead.—An addition to Christchurch cottage, Christchurch-passage, New-end, Hampstead (Mr. J. D. Hunter for Mr. E. A. Rusher).—Refused.

St. Pancras, East.—A two-story building on the north-east side of Rochester-place, Camden Town, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. T. B. Westcott for Messrs. G. Skey and Co., Ltd.).—Consent.

Paddington, North.—That the application of Mr. J. H. Bethell on behalf of the London and South Western Bank, Ltd., for an extension of the periods within which the erection of buildings on the north side of Harrow-road, Paddington, westward of No. 474, was required to be commenced and completed, be granted.—Agreed.

Southwark, West.—A building on the south side of Clink-street, Southwark, eastward of bank-end, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. H. Baerselman).—Refused.

Lewisham.—Five buildings on a site abutting upon the north side of Marischal-road, High-road, Lee, with external walls and boundary fences at less than the prescribed distance from the centre of the roadway of Marischal-road (Messrs. D. Smith, Son, and Wakley for Earl St. Germans).—Refused.

Width of Way, Lines of Frontage and Projections.

Strand.—A building upon the site of Nos. 17, 19, 20, and 21, Tavistock-street, Covent-garden (Mr. E. L. Lutvans for Sir G. Newnes, Bart.).—Consent.

Marylebone, East.—A building upon the site of No. 54, Harley-street, St. Marylebone, with external walls at less than the prescribed distance from the centre of the roadway of Lansfield-mews, and with a bay-window and balcony abutting on Harley-street (Messrs. Aven and Wigglesworth for Dr. J. Galway).—Consent.

Bermondsey.—Buildings on the east side of Vild's-tennis, Low-lane, Bermondsey (Mr. E. Trosse for the Old English Vinegar Company, Ltd.).—Consent.

Hampstead.—An iron and glass covered way in front of "Normanhurst," Priory-road, West Hampstead (Messrs. Baker and Iay for Mr. F. P. Schoite).—Refused.

Paddington, North.—A one-story addition upon part of the forecourt of No. 11, Warwick-road, Paddington, abutting also upon Warwick-street (Mr. J. Martin for Mr. H. B. Merton).—Refused.

Buildings for the Supply of Electricity.

Paddington, South.—A sub-station on the east side of Salem-road, Moscow-road, Paddington (Mr. W. H. White for the Metropolitan Electric Supply Company, Ltd.).—Consent.

Marylebone, West.—The use of a portion of the ground floor of No. 34, North-street, St. Marylebone, as a battery-room (Mr. J. S. Highfield for the Metropolitan Electric Supply Company, Ltd.).—Consent.

Norwood.—A roof over a grease separating plant at the generating station at Bengeworth-road, Norwood (Messrs. Kincaid, Waller, Manville, and Dawson for the South London Electricity Supply Corporation, Ltd.).—Consent.

Formation of Streets.

Hammersmith.—That the application of Mr. W. G. Ingram for an extension of the period within which the widening of Heath-place, Uxbridge-road, Hammersmith, to 40 ft. was required to be carried out, be granted.—Agreed.

Lewisham.—That an order be issued to Mr. E. Van Putten sanctioning the formation or laying out of a new street for carriage traffic to lead out of Porson-street, Lewisham (for the Council of the Metropolitan Borough of Lewisham).—Consent.

Lewisham.—A deviation from the plan sanctioned for the formation of a new street to lead out of Porson-street, Lewisham (for the road, Lewisham (Messrs. J. Jenkins and Sons for Mr. J. Martin).—Consent.

Hackney, North.—That an order be issued to Mr. G. H. Lovegrove sanctioning the formation or laying out of a new street forming an approach to six buildings erected upon a site at the rear of houses on the east side of Iron-road, Hackney (Mr. R. E. Maskall).—Consent.

Wandsworth.—That an order be issued to Mr. J. C. Radford sanctioning the formation or laying out of new streets for carriage traffic out of the west side of Gwendolen-avenue and south side of Hazlewell-road, Putney (for Lord Westbury).—Consent.

Space at Rear.

Battersea.—Certain alterations to premises on the north side of Green-lane, Battersea (Mr. F. Banister for the Committee of the Battersea Liberal Club).—Consent.

Westminster.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of "Hopkinson House," upon a site abutting upon Vauxhall-bridge-road, Edward-street, and Douglas-street, Westminster, with an irregular open space at the rear (Mr. R. S. Ayling for the Brabazon House Company, Ltd.).—Consent.

Westminster.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a block of buildings on the site of No. 62, Vincent-square, Westminster, with an irregular open space at the rear (Mr. R. S. Ayling for Miss E. M. Smith).—Consent.

Lines of Frontage and Space at Rear.

Paddington, South.—A projecting porch and bay window in front of No. 35, Albion-street, Hyde-park, and of an additional story on the back addition of such building (Mr. S. Skrimshire for Mrs. Moncreiffe).—Refused.

Space at Rear and Means of Escape.

Newington, West.—A building upon a site on the eastern side of Newington-causeway and southern side of Union-road, Newington, with an open space about such building and means of escape in case of fire from the fifth (top) story of such building (Mr. W. G. Scott for Lord Radstock).—Refused.

Alterations to Buildings.

St. George, Hanover-square.—A building on the site of St. George's Chapel, Albemarle-street, St. George, Hanover-square, and to alterations to No. 27, Albemarle-street (Mr. C. G. Miller for Messrs. Viola, Ltd.).—Refused.

Artizans' Dwellings.

Battersea.—Three intended dwelling-houses to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site at the rear of houses on the east side of Stainforth-road, Battersea (Mr. E. Camell for Mr. F. Priddis).—Refused.

BOOKS RECEIVED.

THE CATHEDRALS OF NORTHERN FRANCE. By Francis Milton, with 80 illustrations, plans, and diagrams, by B. Anche McManus. (London: T. Werner Laurie, 6s. net.)

PORTLAND CEMENT. By A. C. Davis. (London: Offices of the Stone Trades Journal, Southampton-street, W.C.)

THE PURIFICATION OF SEWAGE. By Sidney Barwise, M.D. Lond., B.Sc., &c. Second edition, revised and enlarged. (London: Crosby Lockwood and Son.)

THE TELEPHONE SERVICE. By H. L. Webb, M.I.E.E. (London: Whitaker and Co., 1s. net.)

Correspondence.

"ACID" AND "BASIC PROCESSES."

SIR,—I shall be much obliged if you will inform me, through the medium of your journal, the difference between the terms "acid process" and "basic process," as applied to the manufacture of steel.

T. F. D.

[*.* In making steel by the "acid process," the lining of the converter, or of the furnace as the case may be, consists of highly siliceous material, such as ganister, which is capable of acting as an acid at high temperatures, and of fluxing when in contact with basic substances.

In the "basic process" of steel-making, the lining is composed of dolomite (double carbonate of calcium and magnesium), or of magnesium carbonate.

As originally employed, the Bessemer converter was lined with ganister, and the steel produced was made by the "acid process." So long as pure hematite pig iron was used, this form of lining presented no disadvantage, but the need for utilising iron made from phosphoric ores led to the adoption of a basic lining, the reason being that the elimination of phosphorus is adequately effected only in the presence of a base capable of forming a stable phosphate with the oxidised phosphorus. Similarly, an open-hearth furnace, such as that used in the Siemens-Martin process, may be worked with an "acid" or with a "basic" lining.—Ed.]

The Student's Column.

NOTES ON PORTLAND CEMENT.

CHAPTER V.—SOUNDNESS.



ONE of the most important tests to which cement is subjected is that for its constancy of volume or soundness. This test cannot safely be carried out by a novice, and in the hands of an expert, extreme care must be taken. The greatest difficulty encountered is in the making of the pats. In all kinds of material testing the preparation of the specimen and the method of conducting the operation are as important in their influence on the result as the character of the test itself. This is particularly the case with Portland cement. To carry out the test, pats of neat cement about 3 in. diameter, $\frac{1}{2}$ in. thick at the centre, and tapering to thin edges at the circumference are made on a glass plate, and, as in the other tests, the paste should be of normal consistency, thoroughly mixed, and the pat worked well to get rid of air bubbles. Unless care is used in trowelling, strains may be introduced into the mass which develop cracks. A good plan is, after moulding, to tap the glass gently, which re-arranges the molecules, making a more uniform pat free from tension strains. Since Fajja introduced his hot-water apparatus, hot water or boiling tests have been universally used. In the Fajja test the pat is placed immediately after making into the apparatus and steamed at a temperature of 100° to 105° F. till set; it is then placed in water and kept for the remainder of twenty-four hours at a temperature of 115° to 120° F.

For Michaelis's test the originator gave precise instructions for carrying it out. He specified that "a clear pat of Portland cement made upon filter paper on a glass plate" should be allowed to harden in air and water for twenty-four hours. At the expiration of this time it was to be put into water of normal temperature and gradually brought to the boil, at which point it was to be kept for three hours. The pat thus treated should be firm, hard, and free from cracks. Since Michaelis introduced his test it has been shown by several experimenters that unsoundness due to excessive amount of magnesia is not developed much under six hours. There are numerous other hot tests for soundness, chief of which are:—

(1) Devall's. In this test pats of cement are allowed to set, then placed in a steam bath and heated for twenty-four hours at a temperature of 80° C. This is quite as severe a test as Michaelis's and in some instances the author has found slight movement in pats thus treated, while the same cement has stood Michaelis's test perfectly. This, however, may have been due to the preparation of the test pieces.

(2) Heintzel's ball or glow test. Balls are made by working the cement paste in the hands. They are then allowed to set sufficiently to take only slight impression of the finger nail. They

—	Hours in Bath.	Temperature of Bath ° C.	Expansion per cent.	Tensile Strain per sq. in.	—	Briquettes in Water of Normal Temperature. Tensile Strain per sq. in.		Hard Set in minutes.	Residue on Wire Sieve.		Pats 28 days in Fresh Water of Normal Temperature.	Second Hot Test after Aeration.					
						7 days.	28 days.		50 ²	75 ²		Hours in Bath.	Temp. of Bath.	Expansion per cent.	Tensile Strain per sq. in.	—	
																	—
A	26	80	.32	300	Sound: Hard.	493	733	65	11	6	Sound.	—	—	—	—	—	—
B	26	80	.72	229	" "	433	643	45	2	6	"	—	—	—	—	—	—
C	26	80	nil	300	" "	453	563	90	2	6	"	—	—	—	—	—	—
D	26	80	.12	300	" "	446	636	120	11	6	"	—	—	—	—	—	—
E	26	80	.15	330	" "	520	663	45	3	8	"	—	—	—	—	—	—
F	26	80	.22	325	" "	430	650	60	13	6	"	—	—	—	—	—	—
G	26	80	.15	250	" "	456	553	60	2	8	"	—	—	—	—	—	—
H	26	80	.15	250	" "	416	616	90	24	10	"	—	—	—	—	—	—
I	26	80	1.33	100	Badly cracked.	490	656	240	14	5	"	22	80	.07	200	Sound: Hard	—
K	26	80	2.10	100	" "	493	735	60	13	6	"	22	80	.32	300	"	—
L	26	80	.44	+	" "	493	643	45	2	6	"	24	80	.72	220	"	—
J	26	80	2.04	100	Cracked.	539	716	90	1	5	"	22	80	.15	360	"	—
M	26	80	2.01	*	" "	446	636	120	14	6	"	24	80	.12	300	"	—
N	26	80	.75	*	Slightly cracked.	273	476	120	1	4	"	24	80	.32	280	"	—
O	26	80	.80	100	" "	564	639	60	13	6	Very slight move.	24	80	.02	330	"	—
P	26	80	1.20	*	" "	536	676	60	1	6	"	22	80	nil	240	"	—
Q	24	80	5.44	+	Swelled much: Soft	470	640	30	13	6	"	22	80	1.8	+	Cracked.	—
R	24	80	5.84	+	" "	463	576	45	13	6	"	22	80	2.72	+	"	—
S	24	80	5.92	+	" "	440	608	60	13	6	Very slight move.	24	80	3.12	+	"	—

* Broke under 100 lb. † Too large to fit clips of machine.

are then placed on thin sheet-iron and heated over a Bunsen burner, at first gently, and as the balls dry the heat is gradually raised till no more steam is given off. The balls should remain firm and hard.

(3) Tetmajer's test is very similar to Michaelis's, only balls instead of pats are prepared and boiled for six hours.

(4) Prüssing's compressed cake test. The cement is mixed with from 5 to 8 per cent. of water, then placed evenly in a mould and subjected to a pressure of 50 atmospheres. The cakes taken from the moulds are allowed to harden twenty-four hours, precautions being taken to prevent drying. The cakes are then placed in cold water for from two to twenty-four hours, then placed in a hot-water bath of 90° to 100° C. According to the originator of the test, cakes which showed no change after being four hours in hot water were generally considered of sound cement. If after twenty-four hours no visible change had taken place, then the cement was certainly sound under hardest conditions, and, if these cakes showed also particularly good strength, then these cements were good as regards this quality. It is almost impossible to obtain a cement which will stand this test, the tendency to warp being due to the manner of preparing the cakes.

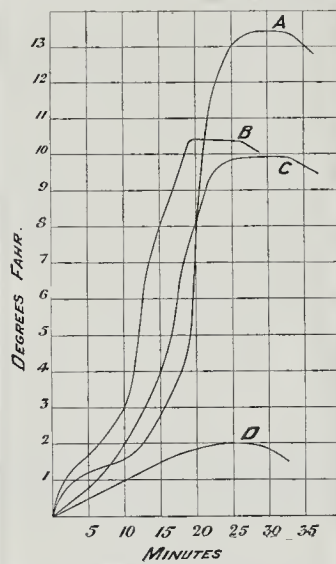
About eight years ago the author experimented with a large number of cements with the view of obtaining quantitative results for "soundness." The change of volume in briquettes which were boiled or steamed was measured by means of Michaelis's micrometer and the briquettes then tested for tensile strain. The results, a few of which are shown in the table, were very interesting, but not reliable, owing to the large number of cements of that day being unfit to stand the hot test.

Much difference of opinion seems to exist as to the value of hot tests, as many cements which have failed to pass such tests have stood well in concrete work. It is generally accepted that a cement which will stand this test can safely be used, but should not be condemned on its failure to pass it. At present the only reliable test for soundness is to place a pat of neat cement in fresh water of normal temperature, where it should remain for about twenty-eight days, and examined from time to time for signs of movement. When this test is carefully carried out and the cement shows signs of "moving," it should not be used until a further test is made of the aerated sample. In many cases movement is caused by the extreme freshness of the cement, and can be overcome by aeration.

Test Tube or Bottle Test.—In this test the cement paste is poured into a bottle or test tube till it is completely filled and free from air bubbles. It is then allowed to set, and if, at the expiration of seven days, the vessel remains uncracked or the cement does not shrink it is considered sound. This is a very misleading test, and so many sources of error are possible that it should never be attempted except by an expert. The greatest care is necessary in getting the cement paste into the bottle or test tube and even then other causes than expansion through free lime may cause the glass to crack, such as changes of temperature.

"Marmalade Pot" or Temperature Test.—A most misleading test, and one which causes the manufacturer much unnecessary trouble, is

that advocated by Mr. G. F. Deacon a few years ago, and familiarly known as the "marmalade-pot" test. Mr. Deacon described it as "a perfectly simple and exhaustive test for free lime which can be made in a few minutes." It is as follows:—"A band sample of cement, a small vessel of water, a marmalade pot, and a thermometer are left together for a short time to acquire a uniform temperature. The cement is then gauged in the pot as quickly as possible, with just sufficient water to render it plastic, and the thermometer, being immediately pressed into it, the initial temperature is recorded. If within fifteen minutes the rise of the thermometer exceeds 2° F., or within sixty minutes 3° F., the cement is further exposed before use." A large number of cements have been tested by the author for rise of temperature during setting, and in most cases the samples showing the greatest increase have been perfectly sound under the hot-water test. The diagram shows the results of four samples thus tested. A, B, and C were sound after steaming for twenty-four hours at 80° C., while D was badly cracked under similar treatment.



Mr. D. B. Butler, in his paper on "The Finer Grinding of Portland Cement and the Comparative Value of the Coarser Particles," described some experiments to ascertain the relation between the setting properties of cement and the heat evolved during setting, and also how far the theory was correct that little or no increase in temperature pointed to the absence of free lime "that is a 'sound cement.'" Samples were tested in the Faija apparatus. One sample which showed an increase of 9° F. in sixty minutes during setting, when ground

extremely fine showed an increase of 29° in thirteen minutes, and the fine grinding had rendered it perfectly sound. Several samples of unsound cement were secured and re-ground. Greater increase of temperature was shown on gauging the re-ground samples than the original ones, but the fine grinding had rendered them nearly or quite sound when subjected to the Faija test. One sample specially prepared containing a large amount of free lime, showed an increase of 17° F. in thirty-five minutes during setting. The same sample mixed with 2 per cent. gypsum and rendered very slow setting increased only 1° F. in fifteen minutes and was still unsound. A large number of similar cases might be cited to show the absurdity of this test as one for "soundness." Unsound over-limed cements are generally slow setting and evolve little heat. It is the coarse grain containing free lime, which slake only slowly and expand after the cement is set, which are dangerous. The rise of temperature when cement is mixed with water is less due to the heating of the free lime than to the crystallisation of the cement compounds. The heat evolved by the latter action is much greater than from the slaking of free lime.

GENERAL BUILDING NEWS.

CHURCH, NEAR LLANDRINDOD WELLS.—The foundation-stone has just been laid of the new church for the parish of Dissorth, which is being built near Crossway, Howcy. The architect is Mr. R. Wellings Thomas, Llandrindod Wells; and the contract has been entrusted to Mr. S. Arthur Bounds, also of Llandrindod Wells. The church will stand on a site 67 ft. by 22 ft., and it will be built of stones from Brynhir Quarry.

NEW CHURCH, SKWEN, CARLISE.—The foundation-stones were recently laid of a new parish church, which is to be erected at Skwen. The building will accommodate some 350, and is to be built of Morriston pressed bricks, with biscuit-coloured terracotta dressing. The style is Gothic. A organ chamber and vestry are provided. The architect is Mr. J. C. Rees, and the contractors, Messrs. Price Brothers, of Carlisle.

PRIMITIVE METHODIST CHAPEL, HOLMWOOD, SHEFFIELD.—The foundation-stones were laid a short time ago of a new Primitive Methodist chapel at Holmwood. The total cost of the work will be about 1,850l. The new chapel has been designed, in the Gothic style, by Mr. W. Cecil Jackson, of Chesterfield. The walls will be faced with red bricks, and will have stone dressings. The building, which will comprise a main hall, choir, and two vestries, will provide accommodation for 375 worshippers. There will be two front entrances and vestibules. The open timber roof will be covered in with blue slates. The timber work and furniture will all be of pitch-pine. The windows will be glazed with stained glass. The builders are Messrs. Brailsford and Randall, of Hasland.

PRIMITIVE METHODIST SCHOOL-CHAPEL, SHEFFIELD.—A new Primitive Methodist chapel and Sunday school are to be erected on site in Abbeydale-road, Sheffield. The plans for the buildings have been prepared by Messrs. Hall and Fenton, architects, Sheffield.

SCHOOL, YORK.—A new Council school which has been erected on the Poppleton-road, York, to meet the elementary educational requirements of the Poppleton-road and Leema

road districts, was opened on the 5th inst. The actual cost of the school, which has places for 1,200 children, has been 21,952*l.* The school is built of plain brick, in the Early Georgian style. The school, out-offices, and yards occupy an area of about 1½ acres. In the school there are nineteen separate classrooms of sixty each, a central hall for the upper school, and marching hall, as well as a gymnasium. Mr. W. H. Brierley, of York, is the architect.

SCHOOL, COWIE.—At Cowie, near Bannockburn, the St. Ninian's School Board have built a new school from the plans of Mr. Donald Walker, Stirling. The building has cost 4,500*l.*, and gives accommodation for 308 pupils.

ROYAL ALBERT MEMORIAL COLLEGE, EXETER.—The Corporation of Exeter have agreed that application shall be made to the Local Government Board for a loan in respect of the proposed additions to the "Royal Albert Memorial College," for which plans, etc., are to be forthwith prepared by Messrs. Tait and Farvey, of Exeter, for the approval of the Board of Education and the Local Government Board.

SOUTHALL-NORWOOD FREE LIBRARY.—The foundation-stone was laid recently of a new library for Southall and Norwood. The Surveyor of the Council, Mr. R. Brown, prepared the plans, and the tender of Messrs. Ferguson and Co., of Tottenham and Carlisle, for the building, was accepted. The building has a frontage of 50 ft. to the street. The entrance to the library will be at the centre of the building, and there will be rooms on either side. The entrance is under three arches. The facade will be faced with Leicester red bricks, with buff terra-cotta dressings, the entrance arches being supported by Corinthian columns. Over the arches will be a terra-cotta panel, with the words "Southall-Norwood Public Library."

Just thereon, and above the centre window, in the first floor, will be a terra-cotta panel commemorating the name of the donor of the library (Mr. Carnegie), the whole surrounded by a terra-cotta pediment. The building stands 18 ft. from the roadway, and in front will be ornamental wrought-iron railings. On the right of the entrance there will be a ladies' waiting-room, about 19 ft. by 15 ft. 6 in., and on the left there will be the entrance to the book store and lending library. The reading-room will be 43 ft. long by 25 ft. average width. Leading from the reading-room there will be a reference library, 20 ft. by 23 ft. 6 in. The whole of the floors, with the exception of the entrance hall and lavatory, will be of pitch-pine wood blocks, the hall being laid with mosaic. There will be a lecture hall, 53 ft. square, and a committee room, the same size as the ladies' waiting-room, on the ground floor. The whole of the building will be heated by hot water. The internal fittings will be of pitch-pine wood.

THE HOTEL METROPOLE, SOUTHEAD-ON-SEA.—The new Hotel Metropole, Southend-on-Sea, was opened recently. The building, which has cost upwards of 300,000*l.* to erect, has been built from the plans of Mr. James Thompson, architect. The furnishing has been carried out by Messrs. Goodall, Lamb, and Leitchway, of Manchester, and by Messrs. Blozmann, of London.

NEW FIRE STATION, KENSINGTON.—The memorial-stone of the new fire station, which is being erected in Clarence-mews, Kensington, was laid a short time ago. The plans for the work have been prepared by Mr. W. E. Riley, architect to the London County Council, and the contractors are Messrs. Kerridge and Shaw. The total cost, inclusive of site, will be about 19,430*l.*

DRILL HALL, WALSLEND.—A drill hall for the 2nd V.B. Northumberland Fusiliers has been erected at Walslend. It is 75 ft. by 10 ft., and has cost about 1,750*l.* On the basement there are armory, clothes-room, sergeants' mess, orderly-room, and stores, while on the first story there are the officers' mess, clothes-room, and stores, together with balcony overlooking the hall. The building is constructed of red brick and corrugated iron, and ground is in reserve on which to put up a caretaker's house and reading and recreation rooms for the men. Mr. M. H. Graham, of Newcastle, was the architect, and the contract has been carried out by Mr. Weir, of Howdon-on-Tyne.

REFUSE FURNACE, KENSINGTON.—The foundation-stone of the new furnace-house, in Woodland, Kensington, was recently laid. The work is being carried out by Messrs. Goddard, Massey, and Warner, whose scheme and tender was accepted upon the advice of Mr. William Weaver, the Borough Engineer, and Sir A. R. Binnie. The building will contain twenty furnace cells, having a total cubical capacity of 11,110 ft., capable of dealing with 450 tons of refuse per twenty-four hours, the

refuse being carted up inclined planes to tipping platforms on the top of the furnace cells. At the back of the cells storage hoppers, in which refuse awaiting combustion would be placed, will be provided. The chimney shaft will be 156 ft. high. Two steam boilers are to be erected in connexion with the furnaces, each working at a pressure of 160 lbs. to the square inch, from which power will be supplied to machinery for the utilisation of the clinker refuse, and also the necessary heat for the disinfecting *apparatus*. The cost of the scheme will be 39,513*l.*

APPOINTMENTS.

UNIVERSITY OF LEEDS.—At a meeting of the Council of the University of Leeds on the 10th inst., the Council appointed Dr. George Wilson, A.M.Inst.C.E., to the newly-created Lectureship in Civil Engineering in the University. Dr. Wilson is a graduate in science of the Victoria University, having been a student at Owen's College, where he gained the Ashbury scholarship in engineering. He had two years' experience as a member of the engineering staff of Sir Leader Williams, then chief engineer of the Manchester Ship Canal. He was subsequently appointed demonstrator in the Whitworth laboratory of Owen's College, in which post he has had ten years' experience. In 1902 the Council of the Institution of Civil Engineers awarded him the Telford Premium for experimental work on lateral pressure in sand and its alteration by water.

FOREIGN.

FRANCE.—The architectural department of the Paris Municipality is about to undertake, in co-operation with the Commission des Monuments Historiques, some important works of restoration at the church of St. Gervais. The principal object of the work, which will cost about 135,000 francs, is the repair or rebuilding of the nave buttresses. In the crypt of the Madeleine, where some work is going on, has been found the tomb of Vigon, the original architect of the building, which, according to the intention of Napoleon, was to have been a "Temple de la Gloire" and not a church. The tomb was concealed under a pile of stones, and is to be opened out and restored. The jury in the competition for the "Monument de l'Union Postale Universelle," to be erected at Berne, has chosen from among 122 competitors the design by M. René de Saint-Marcieux. The design shows a group of five female figures, representing the five continents, circling round a terrestrial globe, and passing messages from hand to hand. Below is seated the heraldic image of Berne. Important works for the improvement of the port of Havre are to be undertaken, at a cost of 34 million francs. The General Council of Finistère has voted a sum of 247,000 francs for the enlargement of the Prefecture of Quimper. The Chamber of Commerce of Limoges has voted a sum of 240,000 francs for the installation of a "Hôtel des Services." The jury in the competition for a statue of Jeanne d'Arc, to be erected at Arras, has declined to recommend any one of the designs for execution, merely awarding premiums to the three best designs.

The Municipal Council of Paris has offered to the town of Riom, the birthplace of Desaix, the statue of the celebrated Republican general which was formerly in the Place Dauphine, and was removed at the alterations made in the Place in 1874. The monument, which is in a rather dilapidated condition, consists of a stele with an inscription, surmounted by a bust of Desaix, which is being crowned by a figure in the dress of a Roman warrior. The general design of the monument is by the architect Percier, the bust and the figure were executed by Fortin. The work is at present in the Art Museum at Auteuil. M. Waldeck-Rousseau, whose death has been recently announced, was not only a politician of the first rank, but an enthusiastic lover of painting and sculpture, and enjoyed the regard of many artists, especially of Falguère, of whom he was a faithful friend. He himself possessed great talent as a painter in water-colours.

AUSTRIA.—The monument to the artist Canon, to be erected in Vienna, will soon be completed; the statue is being executed by the sculptor Professor Weyr. The new Surgical Hospital, at Vienna, is now in course of construction; the work is to be pushed forward as much as possible, and it is hoped that a portion of the building will be fit for use by January next. The foundation-stone of the new Catholic church at Zeltweg is to be laid on August 21; the architect is Herr Hans Pascher.

SWITZERLAND.—The Second International Congress for the Promotion of Draughtsman-

ship was held on August 2, when twenty-one states were represented by over 900 delegates.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Candy and Co., Ltd., have removed their offices and showrooms from Mansion House Chambers, 11, Queen Victoria-street, E.C., to 87, Newman-street, W.

ST. PHILIP'S CHURCH, REGENT-STREET.—Mr. James Green, in his capacity of arbitrator for the claim preferred by Messrs. J. Lyons and Co., against the Ecclesiastical Commissioners, has just made his award in respect of the wine vaults and cellars beneath the church. The award amounts to 10,400*l.* in respect of the leasehold interest of that company, who claimed about 6,000*l.* more. The church will shortly be pulled down, in pursuance of an Act recently passed in that behalf, for the sale of the site and materials.

SITE OF CHRIST HOSPITAL, LONDON.—The estimated cost of constructing the new street, with sewer and subway, across the new vacant site, is estimated at 45,000*l.*, of which sum the Corporation of the City will contribute 25,000*l.* The ground has been acquired for purposes of the General Post Office, and, in lieu of the projected thoroughfare to relieve the traffic along Newgate-street, steps are being taken for a widening of King Edward-street.

ARBITRATION INQUIRY.—An arbitration inquiry was held at the Surveyors' Institution, Westminster, on the 10th inst., before Mr. E. A. Cruning, sole arbitrator, respecting a claim brought by Messrs. Kirk and Randall against the Office of Works for the balance of money alleged to be due to them under their contract as builders for the erection of the new Post Office Savings Bank at Kensington, which has been in occupation of the department for over a year. Mr. English-Harrison, K.C., and Mr. J. A. Scott appeared for the claimants, and Mr. Montague Lane, K.C., and Mr. Askwith represented the Commissioners of Works. A number of legal points were raised as to the interpretation of the contract, but no witnesses were called. At the conclusion of the arguments, which had occupied two days, the arbitrator consented to state a case for the opinion of the High Court.

THE INTERNATIONAL FIRE SERVICE CONGRESS.—The British representation for the International Fire Service Congress, to be held at Budapest, comprises a special Commission formed by the British Fire Prevention Committee, with Mr. Horace Folker, of the National Fire Brigades' Union, and Mr. Ellis Marsland, District Surveyor, as honorary secretaries. The Commission, besides participating in the Congress at Budapest, will report on the fire preventive arrangements of Vienna, Munich, Frankfurt, and Cologne. The Commission, which is ten in number, includes:—Mr. Edwin O. Sachs, Chairman of the British Fire Prevention Committee (as chairman of the deputation), and Lieut. Colonel Fox, Vice-President of the N.F.B.U. The work under consideration at the Congress has special relation to the Baltimore fire, fire prevention in theatres, factories, and mills, to the question of mechanical life-saving ladders and fire alarms. At a meeting of the International Fire Service Council, to be held at the same time as the Congress, the question of universal statistics and other matters will be considered.

THE BATH STONE FIRMS, LTD.—The annual excursion of the employees of the Bath and Wiltshire district of the Bath Stone Firms, Ltd., took place on Saturday last to Plymouth. Three special trains were engaged, and conveyed about 2,000 to the town. Some of the directors and the whole of the office staff accompanied the party.

CANDLER MEMORIAL DRINKING FOUNTAIN, BROCKWELL PARK.—As originally purchased and laid out, Brockwell Park comprised some 55 acres. It was bounded on the Brixton side by 43 acres of building land, and in July, 1899, it became known that this land was in the market. At once a local committee was formed, and ultimately the purchase price was subscribed, and the whole space preserved for the use of the public. This result was largely due to the zeal of Alderman Samuel Horak Candler, the vice-chairman of the Park Extension Committee. At his death it was felt that some memorial of his efforts should be erected in the open space. A fund was opened, and, with Mr. Albert Larking as hon. sec., a drinking fountain was erected at the Water-lane entrance to the park, and this has just been unveiled. The fountain, erected to the designs of Mr. A. W. Sheppard, architect, John-street, Adelphi, is of grey and red granite, capped with York stone, and bears on one panel a bronze portrait medallion of Mr. Candler, and on the other an inscription. The work has been carried out by Mr. J. Whitehead, of Rochester-row, London.

CAPITAL AND LABOUR.

THE YORKSHIRE BUILDING TRADE.—The federated master builders of Yorkshire are anxious to put an end to the possibility of strikes and lock-outs in their trade in the county, and, with this object, have suggested to the men a "closer union scheme." They desire that in future all disputes in the Yorkshire building trades shall be submitted to a Board of Conciliation and Arbitration, the constitution and detailed operations of which they propose shall hereafter be decided upon in accordance with the wish of these peace-loving employers, the bricklayers, masons, and carpenters and joiners have discussed the "principle of arbitration and conciliation" at their branch meetings, and have taken a vote on the question. The result is that an overwhelming proportion of Yorkshire bricklayers and masons in favour of such a tribunal, while, on the other hand, the members of the Yorkshire branches of the Amalgamated Society of Carpenters and Joiners have expressed their disapproval of the scheme by a majority of 1,595, only 512 voting in its favour, as compared with 1,907 against. Of the seventy branches of this union, a dozen had a majority in support of the idea, these including the largest branch in Sheffield, which voted unanimously in its favour. The eight Leeds branches gave a unanimous vote against. This decision, however, cannot be taken as final, as it is said that the carpenters were misled by an unofficial statement in which it was hinted that official statement in which it was hinted that one point of the "Closer Union Scheme" would be permitted to work for any but employers connected with the Master Builders' Federation. The head officials of the Amalgamated Society of Carpenters and Joiners now recognise that this communication was unofficial, and in their monthly report they say: "We deplore this action because we are convinced that the interests of members can best be promoted by cultivating a closer union between their employers and themselves, and we hope that if the opportunity again offers itself a more liberal view will prevail, and that our society will emerge from the isolated position it now occupies in respect to this question. Now that the air has been cleared, and it has definitely and officially been declared that all details are hereafter to be discussed and determined, the carpenters and joiners of Yorkshire are not likely to lose much time in falling in line with their brother workers in the trade.—*Sheffield Independent.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

15,811 of 1903.—F. G. P. PRESTON and G. C. RALSTON: *Simultaneously-operated, Multiple-cam Devices for Operating and Fixing in Position Bulk-head Doors, and other Doors, Ships' Side Lights, and other Windows, Cylinder Covers, and other Covers.*

This consists in the combination with a door, window cover, or ring, and the frame or part with which it is to make joint, of a number of pivoted cams, means for connecting the cams, and means for simultaneously operating said cams for the purpose of pressing the door tightly against the frame.

17,842 of 1903.—J. J. JACKSON: *Holders or Rope Grips for Elevators, and Conveyors, and Lifts.*

An elevator or conveyor for elevating or conveying grain and other substances or articles, means for connecting the buckets, plates, bars, or other equivalent parts, of the elevator or conveyor, with the ropes or bands, consisting of gripping devices or clamps attached to or formed on the said buckets, plates, bars, or their equivalent parts, comprising a gripping bolt or plug, and a wedge or key arranged to operate in connexion with said bolt or plug.

17,845 of 1903.—J. J. CARTWRIGHT: *Fixed or Portable Cooking and Warming Apparatus.* A fixed or portable cooking and warming apparatus, wherein solid fuel is burned, consisting in the construction and application of a perforated fire-box, suspended in an air chamber, the supply of air to which is controllable, in combination with a closed and hollow-lined roasting chamber open to the said perforated fire-box.

19,860 of 1903.—E. J. PARRISH: *Means for Supporting Window Sashes, etc.*

Means for supporting window sashes, etc., consisting of a front plate having flanges thereon, a rectangular opening in the upper part of the front plate, corner slots in the

lower part thereof, a flattened V-shaped back-plate pivoted at its upper end, bearings at or near the upper end of the rectangular opening for the pivots of the back-plate, a projection upon the front-plate for preventing the pivots of the back-plate jumping their bearings, a roller working in the recess, formed by the back-plate at the rear of the rectangular opening, said back-plate forming a path for said roller, a spring for holding the back-plate up to its work, abutments on the front and back plates for the spring, a bar for tightening the spring working into the corner slots, and a recess in said bar to receive the spring and to prevent the lateral movement of the bar.

20,042 of 1903.—H. PARKER and W. H. BAKER: *Fire Cheek or Fire Brick for Domestic Stoves and Ranges.*

According to this invention, the cheek is formed hollow, with internal baffle-plates or louvres of substantial substance, preferably of a shape approximating to two sides of a triangle, the points of each projection projecting within the groove formed to cause the incoming air to take a serpentine course, so to retard its passage, so that it may be acted upon by passing over the sides of the heated projections, and so become heated before its exit. Near the top of the cheek is a lateral opening to deflect the air over top of oven or boiler. When in position the bottom of cheek is open for inlet of air from ash-pit.

20,421 of 1903.—F. HOWETT: *Manufacture of Artificial Stone.*

This invention relates to the manufacture of artificial stone, and more particularly to the manufacture of such stone slabs and other articles from refuse destructor ashes. The invention consists in treating the refuse destructor ashes with a chemical solution which will render the sulphur contained in the ashes incapable of having any injurious effects on the cement employed in the manufacture of the artificial stone. In the manufacture of artificial stone, according to this invention, the refuse ashes and chinker, after being broken up, but before being mixed with the cement and other well-known ingredients, are thoroughly well washed with a solution of chloride of calcium and soda or potash.

223 of 1904.—E. HURN: *Method of Circulating Hot and Cold Water by Power.*

This invention consists of an internal or external screw inserted in a pipe, worked by power, whereby the circulation of water is accelerated, and all difficulties of circulation overcome. Its operation is as follows:—A revolving screw is inserted in the floe pipe immediately over the boiler or circulator. This screw is worked by belt and pulleys, driven either by motor, gas engine, or steam power. The high speed of this screw causes a greatly accelerated circulation of the water. It also overcomes the balance of power, thus surmounting all dips, in the circulation, thereby enabling any building to be warmed as easily with boiler placed in the roof as in the basement.

1,649 of 1904.—W. BALS: *Door Locks.*

A device for preventing accidental opening of door locks, comprising in its construction a star-wheel with several teeth, fixed to the stationary door wing or door post, and a spring-actuated retaining pawl for the star-wheel, in combination with a specially-shaped door latch.

2,771 of 1904.—J. FIDDIS and J. F. WATT: *Sprinklers for Extinguishing Fire.*

A fire sprinkler, consisting in the combination with a water pipe having a discharge outlet, of a friable bulb or dome normally closing said outlet, means for fracturing said dome, devices for normally supporting said fracturing means, but automatically releasing the same on abnormal rise of temperature.

8,460 of 1904.—A. URMACHIER: *Frames for Concrete Building, and other purposes.*

This relates to a boarding frame for the manufacture of beton structures, the essential feature of which is that, by means of vertical and horizontal bars, united by tubes and pegs, there is formed a frame divided into squares which are lined with short boards of a uniform size, the boards being held or locked together by U-irons and handles, but may be removed without interfering with the frame.

9,944 of 1904.—F. J. M. M. DUCASTEL: *An Agglutinant or Cement, and Method of Manufacturing the same.*

A process for manufacturing an agglutinant intended to replace lime and cement in all their applications, which consists in the treatment with heat in a rotary furnace provided internally with rollers, on the one hand of a preparation of lime or cement, and on the other hand of a given but variable quantity

of silicate, silicates, or even carbonates, these materials being crushed separately and mixed at the moment of their entrance into the said furnace, where, in a state of extreme sub-division, they are subjected to the action of gas.

10,235 of 1904.—E. C. MAHONY: *Portable Wall Sections for House-building.*

A knock-down house, consisting in the construction of its walls in portable sections, each comprising a basic frame on the outer side of which is a covering of weather boarding on a sheathing of impermeable material, and on the other side of the frame a wall lining of interior finishing, with an intervening air space between the outer and inner lining, and means for bonding such sections to one another to the house foundation sill, and to the roof structure.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

August 3.—By R. F. CONDER (at Biggleswade). Langford, Beds.—Froehold allotment lands, 44 a. 0 r. 10 p. £1,790

August 4.—By HAMPTON & SONS (at Haslemere). Bramshot, etc., Hants.—Outlying portions of the Hewshot Estate, 66 a. 0 r. 33 p. 1. 5,980

August 5.—By FENN & CO. (at Chelmsford). Great Baddow, Essex.—"Pitt-pl." and 7 a. 0 r. 28 p. 0. 2,100

August 6.—By FENN & CO. (at Colchester). Wakes, Coln. etc., Essex.—"Creeping Hall Estate," 201 a. 3 r. 13 p. 1. 2,900

August 9.—PERCY H. CLARKE. Brixton, S.W.—Tiddal-st., ut. 56 yrs., g.r. 81, w.r. 65 1/2. 430

45, Langton-rd., ut. 51 1/2 yrs., g.r. 41 1/2, w.r. 36 1/2. 215

55 and 57, St. Lawrence-rd., ut. 59 yrs., g.r. 81, w.r. 60 1/2. 520

Camberwell.—41, Cambridge-st., ut. 46 yrs., g.r. 31, w.r. 29 1/2. 200

43 to 53 (odd), Cambridge-st., ut. 48 yrs., g.r. 12, w.r. 70 1/2. 1,050

86 and 88, Cambridge-st., ut. 46 yrs., g.r. 61, w.r. 72 1/2. 440

Hammermith.—35 and 36, Lion's rd., ut. 52 1/2 yrs., g.r. 58, w.r. 57 1/2. 400

By H. N. NEWTON & CO. Hampton Wick, Middlesex.—23, 24, and 25, High-st., l., y.r. 88. 1,750

By SEDGWICK, SON, & WEALE (at Watford). Watford.—1a, 2, and 2a, Nascot-st. l. 1,350

August 11.—By NICHOLAS EDWARDS, & SHERPHARD. Nottiaz Hill.—St. Mark's-rd., Lg. rents 40l., ut. 60 yrs., g.r. 41 1/2. 610

Hackney.—King Edward-rd., etc., Lg. rents 129l., ut. 33 yrs., g.r. 41. 1,800

King Edward-rd., Lg. rents 131l. 10s., ut. 35, r.r. 14 1/2. 1,830

Shoreditch, Lg. rents 41l., ut. 27 yrs., g.r. 27. 470

Stoke Newington.—21, Jenner-st., ut. 69 1/2 yrs., g.r. 61, y.r. 360. 1,370

Islington.—23, Booter-rd., ut. 55 1/2 yrs., g.r. 51 1/2, y.r. 320. 270

19, Norfolk-rd., ut. 69 1/2 yrs., g.r. 54. 270

Hoxton.—93, Herbert-rd., ut. 38 yrs., g.r. 71 1/2, r.r. 85. 460

King's Cross.—38, Abchurch-lane, ut. 41 yrs., g.r. 12, y.r. 79 1/2. 270

Finchley.—51 and 53, Lincoln-rd., ut. 79 yrs., g.r. 121 1/2, y.r. aud. e.r. 681. 560

By SIMMONS & SONS. Charlton.—49, 49 1/2, 497, and 499, Woolwich-rd., ut. 86 yrs., g.r. 122 1/2. 730

Clapham.—20, Park-rd., ut. 38 yrs., g.r. 151, e.r. 750. 550

Fullam.—12, King's-rd., ut. 46 1/2 yrs., g.r. 40, e.r. 531. 1,700

New Cross.—170 to 184 (even), Edward-st., ut. 40 yrs., g.r. 161 1/2, w.r. 231 1/2. 1,700

By WILLIS, CROUCH, & LEE. Clapton.—1 and 3, Gauden-rd., ut. 58 yrs., g.r. 151, y.r. 941. 830

Hampstead.—40, 42, and 46, Denington Park-rd., ut. 77 yrs., g.r. 311 1/2, y.r. 1731. 1,150

By A. C. NICHOLSON, with STANFORD & BROWN (at Oswestry). Llanfyllin, Denbighshire.—"Moelygwelltyn Farm," 82 a. 1 r. 23 p. 1. 1,380

"Moelfa Farm," 270 a. 1 r. 15 p. 1. 3,750

August 12.—By TYSER, GREENWOOD, & CRIER. Gunpowderbury, 3 and 5, Harvard-rd., ut. 72 yrs., g.r. 304, y.r. 1900. 910

Contracts used in these lists.—F.G.R. for freehold ground-rent; L.G.R. for leasehold ground-rent; I.G.R. for improved ground-rent; g.r. for ground-rent; r. for rent; l. for leasehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; ut. for unexpired term; p.a. for per annum; y.s. for years; l. for land; st. for street; rd. for road; sq. ft. for square ft.; pl. for plot; for. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; g.l. for grove; h.h. for beer-house; p.h. for public-house; c. l. for offices; s. for shops; ct. for court.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 10s. per annum (6s. numbers) PRE-PAID. To parts of Europe, America, Australia, New Zealand, India, China, etc., at 12s. per annum. Remittances (payable to THE BUILDER) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

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* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

MEETINGS.

SATURDAY, AUGUST 20. Northern Architectural Association.—Visit to Sunderland. OCTOBER 6 and 8.

Visit of the Royal Institute of British Architects to Newcastle-upon-Tyne.—The following amongst other arrangements are being made in connection with the visit of the Institute to Newcastle: The Northern Architectural Association Reception Committee will receive the visiting members of the Institute at the County Hotel, at 8.0 p.m., on October 6th. His Worship the Mayor of Newcastle will receive the members at 10.0 a.m., on October 7th. After which, about an hour will be devoted to the reading and discussion of a paper on Specialism in Architecture. The President of the I.B.A. will take the Chair. The Cathedral and the Trinity House will be visited. The Northern Architectural Association will entertain the visiting members at luncheon at the County Hotel, Newcastle-street, at 8.0 p.m. Arrangements will be made for those members who wish to do so, to visit during the afternoon of Friday, places of interest in the immediate neighbourhood. In the evening a dinner will be held, and on Saturday, October 8th, arrangements will be made for those who desire to do so, to visit Hexham Abbey and the Roman Station at the Chesters, Chollerford, etc.; also the New Shipbuilding Sheds at Messrs. Swan & Hunter's, Wallsend.

TO CORRESPONDENTS.

H. M. T.—F. C. (Below our limit). NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents sent to or left at this office, unless he has specially asked for them. Letters or communications (beyond news items) which have been duplicated for other journals are NOT DESIRED. All communications must be authenticated by the name and address, and whether for publication or not. No notice can be taken of anonymous communications. We are compelled to decline pointing out books and giving addresses. Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Table listing prices for various types of bricks and building materials, including Hard Stocks, Rough Stocks, Grizzles, Facing Stocks, Shippers, Flattons, Red Wire Guts, Best Farnham Red, Best Red Pressed, Harboun Facing, Best Blue Pressed, Staffordshire, Do. Bullnose, Best Stourbridge, Fire Bricks, Slazed Bricks, Best White and Ivory Glazed, Stretchers, Headers, Quoins, Bullnose, and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered, Squints, Best Dipped Salt Glazed Stretchers and Header, Quoins, Bullnose, and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered, Squints, Second Quality White and Dipped Salt Glazed, less than best.

BRICKS, &c.—(continued).

Table listing prices for Thames and Pit Sand, Thomas Ballast, Best Portland Cement, Best Ground Blue Lias Lime, and Grey Stone Lime. Includes a note about the cement or lime being exclusive of ordinary charge for sacks.

STONE.

Table listing prices for Bath Stone, Portland Stone, Brown Whitbed, White Basebed, and Annaster in blocks. Includes a note about York Stone—Robin Hood Quality.

Table listing prices for Scapelled random blocks, 6 in. sawn two sides landings to sizes, 6 in. rubbed two sides, 3 in. sawn two sides, 2 in. to 2 1/2 in. sawn one side slabs, and 1 1/2 in. to 2 in. ditto.

Table listing prices for Scapelled random blocks, 6 in. sawn two sides landings to sizes, 6 in. rubbed two sides, 3 in. sawn two sides, 2 in. to 2 1/2 in. sawn one side slabs, and 1 1/2 in. to 2 in. ditto.

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SLATES.

Table listing prices for 20 x 12 best blue Bangor, 20 x 12, 20 x 10 first quality, 20 x 12, 18 x 8, 20 x 10 best blue Port-madoc, 16 x 8, 20 x 10 best Eureka untinting green, 20 x 12, 18 x 10, 16 x 8, 20 x 10 permanent green, 18 x 10, and 16 x 8.

TILES.

Table listing prices for Best plain red roofing tiles, Hip and Valley tiles, Best Broseley tiles, Do. Ornamental tiles, Hip and Valley tiles, Best Rubson red, brown, or blushed do. (Edwards), Do. Ornamental do., Hip tiles, Valley tiles, Best Red or Mottled Staffordshire do., Hip tiles, Best "Rosemary" brand plain tiles, Best Ornamental tiles, Hip tiles, Valley tiles, Best "Hartmill" brand plain tiles, sand faced, Do. pressed, Do. Ornamental do., Hip tiles, Valley tiles.

WOOD.

Table listing prices for Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in., Deals: best 3 by 4, Battens: best 2 1/2 in. by 7 in. and 3 in. by 7 in. and 3 in. by 8 in., Battens: best 2 1/2 by 6 and 3 by 6, Deals: seconds, Battens: seconds, 2 in. by 4 in. and 2 in. by 6 in., 2 in. by 4 in. and 2 in. by 5 in.

WOOD (continued).

Table listing prices for Foreign Sawn Boards, Fir timber, Secondals, Small timber, Swedish balks, Pitch-pine timber, and Joists' Wood.

Table listing prices for White Saw: first yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Second yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Third yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Petersburg: first yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Second yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Third yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., White Sea and Petersburg: first white deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Second white deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Pitch-pine: deals, Under 2 in. thick extra, Yellow Pine—first, regular sizes, Oddments, Seconds, regular sizes, Yellow Pine oddments, Kauri Pine—Planks, per ft. cube, Danzig and Stettin Oak Logs—Large, per ft. cube, Small, Wainscot Oak Logs, per ft. cube, Dry Wainscot Oak, per ft. sup. as inch, do. do., Dry Mahogany—Honduras, Ta-pasco, per ft. super. as such, Selected, Figury, per ft. sup. as inch, American, per ft. sup. as such, Teak, per load, American Whitewood Planks, per ft. cube, Prepared Flooring—Per square, 1 in. by 7 in. yellow, planed and shot, 1 in. by 7 in. yellow, planed and matched, 1 1/2 in. by 7 in. yellow, planed and matched, 1 in. by 7 in. white, planed and shot, 1 in. by 7 in. white, planed and matched, 1 1/2 in. by 7 in. white, planed and matched, 2 in. by 7 in. yellow, matched and headed or V-jointed brds, 1 in. by 7 in. do. do., 2 in. by 7 in. white do. do., 1 in. by 7 in. do. do., 6 in. at 6d. to 9d. per square less than 7 in.

Table listing prices for Joists' Wood: White Saw: first yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Second yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Third yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Petersburg: first yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Second yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Third yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., White Sea and Petersburg: first white deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Second white deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Pitch-pine: deals, Under 2 in. thick extra, Yellow Pine—first, regular sizes, Oddments, Seconds, regular sizes, Yellow Pine oddments, Kauri Pine—Planks, per ft. cube, Danzig and Stettin Oak Logs—Large, per ft. cube, Small, Wainscot Oak Logs, per ft. cube, Dry Wainscot Oak, per ft. sup. as inch, do. do., Dry Mahogany—Honduras, Ta-pasco, per ft. super. as such, Selected, Figury, per ft. sup. as inch, American, per ft. sup. as such, Teak, per load, American Whitewood Planks, per ft. cube, Prepared Flooring—Per square, 1 in. by 7 in. yellow, planed and shot, 1 in. by 7 in. yellow, planed and matched, 1 1/2 in. by 7 in. yellow, planed and matched, 1 in. by 7 in. white, planed and shot, 1 in. by 7 in. white, planed and matched, 1 1/2 in. by 7 in. white, planed and matched, 2 in. by 7 in. yellow, matched and headed or V-jointed brds, 1 in. by 7 in. do. do., 2 in. by 7 in. white do. do., 1 in. by 7 in. do. do., 6 in. at 6d. to 9d. per square less than 7 in.

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Table listing prices for JOISTS, GIRDEBS, &c. in London, or delivered Railway Vans, per ton. Rolled Steel Joists, ordinary sections, Compound Girders, ordinary sections, Angles, Tees and Channels, ordinary sections, Flat Plates, Cast Iron Columns and Stanchions, including ordinary patterns.

Table listing prices for METALS. Per ton, in London. Iron—Common Bars, Staffordshire Crown Bars, good merchant quality, Staffordshire "Marked Bars", Mild Steel Bars, Hoop Iron, basis price, Galvanized ("And upwards, according to size and gauge.") Sheet Iron, Black—Ordinary sizes to 20 g., 24 g., 26 g., Sheet Iron, Galvanized, flat, ordinary quality—Ordinary sizes—3 ft. by 2 ft., 3 ft. to 20 g., Ordinary sizes to 22 g. and 24 g., Sheet Iron, Galvanized, flat, best quality—Ordinary sizes to 20 g., 22 g. and 24 g., Galvanized Corrugated Sheets—Ordinary sizes 6 ft. to 8 ft., 20 g., 22 g. and 24 g., 26 g., 28 g.

Table listing prices for METALS. Per ton, in London. Iron—Common Bars, Staffordshire Crown Bars, good merchant quality, Staffordshire "Marked Bars", Mild Steel Bars, Hoop Iron, basis price, Galvanized ("And upwards, according to size and gauge.") Sheet Iron, Black—Ordinary sizes to 20 g., 24 g., 26 g., Sheet Iron, Galvanized, flat, ordinary quality—Ordinary sizes—3 ft. by 2 ft., 3 ft. to 20 g., Ordinary sizes to 22 g. and 24 g., Sheet Iron, Galvanized, flat, best quality—Ordinary sizes to 20 g., 22 g. and 24 g., Galvanized Corrugated Sheets—Ordinary sizes 6 ft. to 8 ft., 20 g., 22 g. and 24 g., 26 g., 28 g.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be delivered. Includes entries for Manchester College, Exors. late G. Handyside, Messrs. Hillier & Sons, etc.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Includes entries for Architectural Assistant, Quantity Surveyor, and Military Inspector.

Those marked with an asterisk (*) are advertised in this Number. Competitions, iv. Contracts, iv. vi. vii. x. Public Appointments, xvi. xvii.

ICES CURRENT.—Continued from page 213.

Table listing METALS (continued) and LEAD, &c. with prices per ton in London.

Table listing various types of pipes and sheets, including Soft Steel Sheets, Lead Sheet, and Copper Sheet, with prices per ton.

ENGLISH SHEET GLASS IN CRATES.

Table listing various sizes of English Sheet Glass in crates, with prices per per ft. delivered.

OILS, &c.

Table listing various oils and putty, including Linseed Oil, Copal Oil, and White Copal Oil, with prices per gallon.

VAENISHES, &c.

Table listing various varnishes and finishes, including Pale Oak Varnish, Elastic Carriage, and Hard-drying Oak, with prices per gallon.

TENDERS.

Communications for new building under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays.

AMBLE (Northumberland).—For 960 yds. of random whin chip paving in Newburgh and Bridge-street back lanes, for the Urban District Council.

BISHOP AUCKLAND.—For erecting cottage homes, and for other work, for the Guardians. Mr. C. Johnston, architect and surveyor, Cockton Hill, Bishop Auckland.

BUSHEY (Herts).—For the drainage and rearrangement of playground, and for erection of playshed, for the Managers of the Boys' British School.

GOWFEN.—For making-up Thompson-street, etc., for the Urban District Council. Mr. B. Grievs, Surveyor to Council.

GRAIG-Y-FEDW.—For erecting thirty semi-detached houses at Graig-y-fedw, near Aberdwr, for the Trustees of the Graig Building Club.

HOVE.—For paving works, etc., Cambridge-road, Conway-street, and Lansdowne-place, for the Corporation. Mr. H. H. Scott, Borough Surveyor, Town Hall, Hove.

ILFORD.—For paving Ley-street, from Cranbrook-road to Vicarage-lane, for the Urban District Council.

ILFORD.—For 315 yds. of oak fencing and one pair of gates in Tanner's-lane, Barkingside, for the Urban District Council.

ILFORD.—For road works, Park-lane, Chadwell, for the Urban District Council. Mr. H. Shaw, Surveyor, Town Hall, Ilford.

KELSO.—For laying main water pipes and construction of reservoir, for the Kelso District Committee.

LONDON.—For reconstructing in concrete part of river wall at Chancellor's Wharf, for Hammersmith Borough Council.

LONDON.—For converting two houses into shops, at 340 and 342, Barking-road, for Mr. W. Spittled.

LONDON.—For the erection of new factory premises on the site of Nos. 45, 46, and 47, Clerkenwell-green, E.C.4., for Mr. A. J. Hollington.

NORTHWICH.—For sewerage works, Winnington-lane, for the Urban District Council.

REDDITCH.—For erecting a brick chimney, 120 ft. high, at the Electricity Works, for the Urban District Council.

SHILDON (Durham).—For road works, East-parade, for the Shildon and East Thickley Urban District Council.

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SENGHENETH.—For erecting shop, warehouse, and stable, for the Industrial Co-operative Society, Ltd.:—
Davies & Lloyd £1,285 0 | High-st. Abart* £1,265 0
R. Jones 1,285 0 | D. G. Jones 1,245 15

SLAITHWAITE.—For 350 tons of Penmaenmawr granite, for the Urban District Council:—

	Per ton.
	s. d.
J. N. Smith & Co. (Horton Granite)	10 9
T. Feather (Cliffe Hill Granite)	12 5
T. Feather (Hard Blue Rock)	8 4
R. Allen (granite as sample)	11 1
R. Allen (granite as sample)	11 4
J. J. Lee (Penmaenmawr Granite)	11 6
Brundrill & Co. (Penmaenmawr Granite 2 1/2 in.)	11 9
Brundrill & Co., Liverpool (Penmaenmawr Granite, 2 1/2 in.)	11 6
Brundrill & Co. (Penmaenmawr Granite) (fin.)	9 3
Ord & Maddison (Blue Granite)	11 10
Threlkeld Granite Co. (Threlkeld Granite)	10 6
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Grounds & Newton	1,290 2 10	382 15 4	760 1 0	585 1 9
G. Porter	1,734 2 6	536 9 6	1,059 7 7	748 1 7
E. T. Bloomfield	1,328 7 3	388 7 2	797 14 11	540 10 1
T. Rowley, jun.	1,361 12 0	407 0 5	411 7 2	893 18 6
T. Adams	1,441 8 4	360 0 0	789 16 6	638 1 0
C. Bloomfield				

ST. ALBANS.—Accepted for the erection of a residence, Clarence-road, for Mrs. E. S. Edmunds. Mr. S. Doddmeade Edmunds, architect and surveyor, St. Albans:—
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J. T. Bushell 1,970 0 | C. W. Dimpel 1,547 0
Miskin & Sons 1,744 0 | Vail & Williamson 1,459 15
Goodchild & Jeffery 1,725 5 | W. Sharp 1,716 0

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New Irrigation Projects for Egypt and the Soudan.—II.



LAST week we dealt with the various questions propounded by Sir William Garstin relative to the control of the Upper Nile. It is scarcely necessary

to point out that as the Soudan and Egypt proper must derive their supplies of water from the same sources, and as the prosperity of both countries depends entirely upon the one river, any important irrigation scheme projected for one country has a definite bearing upon the other. The ostensible object of the Report by the chief of the Public Works Department is to consider the improvement of the Upper Nile, but, as a matter of fact, the Blue-book goes beyond the subjects indicated in the title. For the sake of consistency, however, the discussion of works chiefly connected with Egypt is continued in appendices to the volume.

We now turn to the consideration of the main irrigation projects for Egypt, which, in the opinion of Sir William Garstin, are "advisable for execution within a not very remote future." The mild verbiage of the extract in the foregoing sentence is evidently intentional, for Sir William repeats in the present Report, what he has said on previous occasions, that the execution of large engineering works in Egypt is not

extremely urgent, with the solitary exception of an adequate escape for the Nile during unusually high floods. The various schemes proposed are recognised to be desirable, and properly so, for their realisation would largely increase the wealth of Egypt. We go a little beyond the studied moderation of official language, and suggest that some at least of the projects actually are urgent, although not vital to the financial stability of the country. In support of this contention we cite the fact that, although the Assouan Dam was only completed at the end of 1902, the whole of the water furnished thereby has already been apportioned, and the Irrigation Service has been compelled to refuse applications for water. The world, and Lancashire in particular, wants cotton of that variety which no country can produce better than Egypt, and yet, to quote the words of Sir William Willcocks,* "the Egyptian landowners of 1½ million of acres are compelled to wait perhaps for many years, while every country under the sun which can grow cotton is trying to acclimatise their special product, and they themselves are doomed to sit idle."

Those who read between the lines will see by the following extract that Sir William Garstin is fully aware of the advantages to be gained from the execution of further large engineering works for increasing the supplies of water to cultivators. He says:—"The desire to acquire fresh land in Egypt is general, and is becoming keener. An increase to

the cultivated area must also increase the revenues. If the Egyptian Government is prepared to face a large expenditure, then I see no reason for delaying the execution of the more important projects, and I have no doubt whatever that the results obtained will fully warrant such a decision if taken."

Before discussing any such schemes we will refer briefly to the question of flood escape. So many years have passed without the occurrence of a dangerous flood that the danger to Northern Egypt at such a time may appear to be a remote contingency. Sooner or later, however, another high flood will come, for past records show that the intervals between abnormally high floods never include many years. Owing to the extension of cultivation, the improved methods adopted, the increase of population, and the augmented value of land, the damage consequent upon a breach in the banks of the Nile would be far more serious in the present day than was the case in former times. Therefore it is imperative that a considerable sum should be expended in the provision of means for carrying off the surplus waters of dangerously high floods. If this precaution be neglected there will inevitably come a disaster that will carry ruin and desolation throughout the land. Two methods are now proposed for the provision of escape power: (1) The construction of an escape canal leading to the Wadi Rayan depression in the Fayoum, and (2) the remodelling of the Rosetta branch of the Nile. Both these projects receive attention in Appendix I. of the Report.

* "The Assuan Reservoir and Lake Moeris," 1904.

Department. In the first place, it is necessary to take into account the volume of water which it is now proposed to serve for irrigation purposes in the Sudan. The amount so apportioned is equal to 200 cubic metres per second, and an abstraction from the river during the winter months will not be without its influence on the scheme. As a matter of fact, two alternative projects are proposed by Sir William Willcocks: (1) A reservoir to hold two milliards of cubic metres with a single channel for filling and discharging; (2) A reservoir to hold three milliards of cubic metres with separate inlet and outlet channels.

In a supplement to Appendix I. of the Report, Mr. Webb, Inspector-General of Irrigation in Upper Egypt—making use of figures furnished by Mr. Verschöyle, Inspector-General for Lower Egypt, as to river discharges—shows that after deduction for the Soudan the smaller reservoir proposed could not be filled by means of the Khir Yusuf during the winter months in a year of minimum supply, and that even under a mean year the filling of the reservoir would be difficult and might practically affect navigation in the river. Further, he points out that in order to supply the Yusuf Canal it would be necessary to maintain a head of 4.5 metres above the Assiout barrage, a course that would in his opinion entail the construction of a subsidiary downstream reservoir similar to those recently built by Sir Ambury Brown below the Delta barrage, together with remodelling works in the Khir Yusuf and the upper reach of the Rahimieh Canal. Therefore, in order to render the smaller project feasible, it appears necessary either to increase the supply passing Assouan during the winter or to abandon the idea of providing the supplies proposed for the Blue Nile region. With regard to the second, larger project, Mr. Webb considers that the scheme is quite feasible, as the reservoir could be filled every year by a flood water, and even in very low floods like those in 1899 and 1902. Mr. Webb also criticises the dimensions of the feeder and outlet canals proposed by the originator of the scheme. However, so far as the principle of either project is concerned, there seems to be no essential difference of opinion between Sir William Willcocks on the one hand and Mr. Webb on the other. The recent proposal to withdraw water for the Sudan is a matter that might be dealt with by increasing the flow of the Nile by measures such as those discussed in our article of last week, and the dimensions of the feeder and outlet canals for the new reservoir are simply details, although they may affect the cost of the work very considerably.

There remains, however, one point for consideration which is of much importance, namely, the uncertainty as to whether, when the reservoir is full, the high water level maintained will not gradually cause infiltration through the levee separating the Wady Rayan from the Fayoum. About this there are differences of opinion. Sir William Willcocks states definitely that there will be no infiltration, pointing out that the present Fayoum was formerly full of water standing 63 metres higher than the bottom of the Wady Rayan, and

remained so for thousands of years. He argues that if there had been any serious infiltration from the ancient Lake Mœris there would have resulted a considerable lake in the Wady Rayan which could not have escaped the notice of the numerous travellers who have visited the district in various ages. Other authorities, including Sir Benjamin Baker and his colleagues on the Technical Commission, have expressed the fear that infiltration might result, and, taking everything into consideration, Sir William Garstin comes to the conclusion that a thorough geological examination of the country is desirable before definitely recommending the execution of the project.

Before leaving the question of the Wady Rayan it should be mentioned that in many respects this depression would constitute an admirable site for a flood escape, but we are inclined to agree with Mr. Webb, who points out that, "if the Wady Rayan is to be considered as a flood escape, it would be advisable to still further widen the inlet canal." The late Colonel Ross calculated the minimum discharge of a Nile flood escape at 100,000,000 cubic metres a day. Such a discharge would necessitate a canal of very large section and very heavy expenditure which, the Report says, would only be warranted were no alternative means available. This consideration leads to the third proposal, namely, the remodelling of the Rosetta branch of the Nile.

In his recent pamphlet Sir William Willcocks recommends that both branches of the river should be so improved as to diminish the danger from flood. The insecurity of the country against a very high flood is only known to those responsible for guarding its banks, and we have already stated that immunity from dangerous floods cannot be expected to continue. During high floods, the Nile is considerably above the level of the land, which is protected by embankments stretching from Assouan to the sea. In Upper Egypt a very high flood is fully 1 metre above the land, on the Rosetta branch of the Nile it is 2 metres, and on the Damietta branch as much as 3.5 metres in some places. The Damietta branch is practically little more than a canal, and Sir William Willcocks considers the wisest policy would be for the Government to take the Rosetta branch and call it the Nile, regulating upon the

Damietta barrage as though the Damietta branch were an ordinary canal. He proposes that the section of the Rosetta branch shall be brought to a uniform width by means of spurs, and the banks thrown back where necessary, so that this channel may be able to carry a much larger discharge without danger to the country. It should be added that the desirability of avoiding an excessive discharge in the Damietta branch has long been recognised by the responsible chiefs of the Irrigation Department, and the only thing necessary with regard to this waterway would be to regulate it by means of the Barrage, so that the discharge should not exceed that of a normal flood. In the opinion of Sir William Garstin, it would certainly stand this without any serious risk to the country, more especially if a sufficient sum were spent in strengthening the banks and in training works. He says with regard to the Rosetta branch, "If it is to act as a flood escape, and I agree with Sir William Willcocks that it should be made to do so, then, as he says, it must be put in thorough order and remodelled throughout its length."

Apart from auxiliary works for the efficient distribution of water, and, above all, of drainage works which are absolutely indispensable corollaries to irrigation canals, the conversion of lands from basin to perennial irrigation, the reclamation of areas still unfit for cultivation, and the regular operations of the Irrigation Service, we have now touched upon all the important irrigation works projected or foreshadowed in connexion with Egypt and the Soudan.

Let us next summarise the various undertakings mentioned in the Report, some recommended for immediate prosecution, others for execution after a few years, and others as proper objects for inquiry. In the table following we include the estimated cost of each project, these figures being subject to the reservation that they are, as Sir William Garstin says, "nothing but approximations, based for the most part upon rough calculations, and that consequently they do not possess much value." Definite estimates will of course be prepared later, from which accurate ideas of the cost and value of the various schemes can be obtained. In the meantime we may fairly assume the amounts set forth to be quite near enough for general guidance.

TABLE SHOWING NEW IRRIGATION PROJECTS FOR EGYPT AND THE SOUDAN.

No.	Description.	Chief Object.	Estimated Cost.
1	Remodelling Rosetta and Damietta Branches of the Nile	To provide flood escape	£E. 900,000
2	Raising of the Assouan Dam	To increase storage capacity by 1,000,000,000 cubic metres	500,000
3	Bahr-el-Gebel:— (a) Construction of New Channel (b) Remodelling of Bahr-el-Zaraf	To increase water supply for Egypt and the Soudan	5,500,000 3,400,000*
4	Wady Rayan Reservoir	To store water for Lower Egypt and to serve as a flood escape	5,700,000†
5	Conversion of 750,000 acres in Upper Egypt to Perennial Irrigation	To utilise additional storage in Assouan reservoir	3,000,000‡
6	Two Barrages in Upper Egypt	To facilitate distribution of additional water stored in Assouan reservoir	2,000,000
7	Canal and Drainage Works in Lower Egypt	To utilise additional supplies contemplated	1,000,000
8	Regulation of Lakes Victoria and Albert	To provide further water for Egypt and the Soudan	2,000,000
9	Barrage on Blue Nile	To develop the Eastern Soudan	1,000,000
10	Ghezreh Canal System on Blue Nile	"	2,000,000
11	Reservoir near Rosaires on Blue Nile	"	2,000,000
12	River Cash Scheme	"	500,000
13	Reservoir Project on Abbara River	"	—
14	Reservoir Projects on Rivers Dinder and Rahad	"	—
15	Reservoir Projects on Upper Valley of Atbara River	"	—

* This is merely an alternative. † The cost, as estimated by Sir William Willcocks, is only 2,600,000£. E.
‡ This item is stated at 5,000,000£. elsewhere in the Report, apparently in error.

Beyond the undertakings mentioned in the foregoing table, it must be borne in mind that, as previously stated, at least 1,000,000*l.* has still to be spent upon conversion works in Middle Egypt, so as to permit the complete utilisation of the water held up by the Assouan Dam at its present height. As this expenditure forms part of the previous irrigation programme connected with the Nile Reservoir Works, the item is not included in the table, although the funds have still to be provided by the Egyptian Government.

Considering the relative urgency of the works mentioned in the table, we must first emphasise the fact that, while the needs of Egypt proper are of paramount importance, the Soudan ought not to be neglected. This point to some extent affects the order in which the works are recommended for execution. Again, some of the projects are at present in a very nebulous condition, and cannot be regarded as being more than mere suggestions for inquiry. Lastly, we must remember that, even if the whole of the plans were prepared, and the funds were available, the works could not be completed for many years to come, partly because it would be necessary to preserve a certain natural sequence, and partly because extensive auxiliary works in the form of weirs, regulators, irrigation canals, and drainage channels would have to be executed after the completion of each item in the large programme now before us. Subject to such reservations as these, we may point out what portions require relatively early treatment and what portions may advantageously be left for future consideration.

Having regard to the urgent necessity for protecting the highly-cultivated lands of Egypt from disaster in the event of dangerously high flood, we are thoroughly justified in placing the remodelling of the Rosetta and Damietta branches in the first place, and the raising of the Assouan Dam second, although, as suggested by Lord Cromer, the two works might be dealt with simultaneously. If no special provision were contemplated for the Soudan, we should be inclined to support Sir William Willcocks in advocating the formation of a reservoir and flood escape in the Wady Rayan, and in assigning the third place to this project. The determination of the Public Works Department to take early steps for the development of the Soudan naturally indicates the improvement of the Bahr-el-Gebel as the project next in order to the two already mentioned. Having increased the discharge of the Nile by obviating waste in the Sudd regions, it might certainly be advisable to construct the proposed reservoir in the Wady Rayan, and then, adding the storage capacity of the reservoir to that of the Assouan reservoir, enough water would be stored within the boundaries of Egypt to suffice for the irrigation of every acre of cultivable and reclaimable land. Sir William Garstin at present appears to assume that the improvement of the Bahr-el-Gebel may furnish enough water to render unnecessary the construction of the Wady Rayan reservoir, but possibly he is also taking into account the extra discharge to be obtained by regulation of the Great Lakes. At any rate he does not include the item

among his present recommendations. No one can predict how long it will be before the two projects on the Upper Nile can be realised, and one most favourable feature about the Wady Rayan scheme is that the site is right in the midst of civilisation and readily accessible for the introduction of labour and materials. Assuming no geological difficulties are shown to exist, the construction and filling of the reservoir could be completed within a period estimated by Sir William Willcocks at four years; and by Mr. Webb at seven years. The water stored would then be available for Egypt while more ambitious undertakings were in progress, and when additional supplies from the upper waters of the White Nile become so ample that the Wady Rayan will no longer be required as a reservoir it will constitute an efficient flood escape, as Lake Mœris did in ancient times. The point here discussed is of much importance and clearly deserves consideration.

Turning attention to the Soudan, we cannot do better than quote the words of Sir William Garstin, who says, "The money that may be spent in that region upon development is practically unlimited." At the present time water and irrigation works are wanted to a limited extent for the encouragement of agriculture by the existing population. But it is undoubtedly the fact that the Soudan is not yet ready for the introduction of irrigation works upon a large scale. For many years to come the chief want of the country must be population. As, however, no progress will be possible until a commencement has been made, all the projects mentioned are to be studied without delay, and those which promise even a moderate amount of success will be put in hand as soon as the necessary funds become available.

Sir William Garstin has prepared three estimates which we have summarised in the following table:—

NEW IRRIGATION PROJECTS RECOMMENDED.

No.	Description.	Estimate I.	Estimate II.	Estimate III.
		£.	£.	£.
1	Rosetta and Damietta Branches	900,000	900,000	900,000
2	Assouan Dam	500,000	500,000	500,000
3	Bahr-el-Gebel	5,500,000	3,400,000	5,500,000
4	Conversion of Upper Egypt Basins	3,000,000*	3,000,000*	2,500,000
5	Barrages in Upper Egypt	2,000,000	2,000,000	1,000,000
6	Canal and Drainage Works, Lower Egypt	1,000,000†	1,000,000†	500,000
7	Regulation of Great Lakes	2,000,000	2,000,000	2,000,000
8	Barrage on Blue Nile	1,000,000	1,000,000	1,000,000
9	Ghezireh Canal System	2,000,000	2,000,000	500,000
10	Reservoir at Rosaries on Blue Nile	2,000,000	2,000,000	500,000
11	River Dash Scheme	500,000	500,000	500,000
	Total	20,400,000	18,300,000	12,900,000

* Stated at 3,000,000*l.* on p. 175 and 5,000,000*l.* on p. 176, the latter apparently in error. † Omitted in Estimates I. and II., as given in the Report. ‡ One barrage only.

For some reason, not experienced in the Report, the item for the execution of canal and drainage works in Lower Egypt is omitted from Estimates I. and II. in the original. We have therefore added the cost of these works in each case, so that the three schemes may be comparable, and, as in the previous table, we have put the cost of conversion works in Upper Egypt at the figure first stated in the Report. Estimates I. and II. include the projects which Sir William Garstin selects as those most suitable for execution, leaving the others mentioned in his Report for subsequent consideration. It will be observed that No. II. is the same as No. I., with the exception of the item relative to the Bahr-

el-Gebel, the cost of the new channel being included in the former and that of improving the Bahr-el-Zaraf in the latter. Estimate No. III. deals simply with works considered to be urgent, but a footnote in the Report says, "The only really urgent works to my mind are Nos. 1, 2 and 3. These involve an expenditure of 6,900,000*l.*"

We have now to see what return may be anticipated from the expenditure involved. Sir William Garstin says that this is not easy of calculation, especially so far as the Soudan is concerned, for it is impossible to predict how soon the revenue will reach the maximum, corresponding with the ultimate expenditure. Taking Estimate No. I. as the basis of calculation, the results are as given below:—

APPROXIMATE ANNUAL RETURNS IN LAND TAX FROM EXPENDITURE IN ESTIMATE NO. I.

UPPER EGYPT:—	£.	£.
- Basin Land Converted	375,000	
- Land Irrigated by Pumps	30,000	
LOWER EGYPT:—		
- Land Brought under Cultivation	800,000	1,205,000
THE SOUDAN:—		
Ghezireh Lands	350,000	
Lands on the Gash	50,000	
Land in the Nile Valley North of Khartoum	100,000	500,000
Grand Total		£1,705,000

Assuming the correctness of the figures, the return upon capital would be about 8·35 per cent., without taking into account the increased value of the land brought into cultivation or the increase in the railway and custom receipts. The increase in the value of land would be very considerable. In Egypt alone, two million acres remain for improvement, two-thirds of this area having only flood irrigation, and one-third being entirely without irrigation. Sir William Willcocks, who, in addition to his long office

experience, has acquired useful commercial experience as the managing director of a land and irrigation company, estimates that the value of these lands would be increased by 30*l.* per acre perennially irrigated. This means an addition of 60,000,000*l.* to the national wealth. Taking Estimate No. I., and debiting the Soudan with 2,000,000*l.* only of the cost of works on the Bahr-el-Gebel and at the Great Lakes, we have, in round figures, 13,000,000*l.* for Egypt and 7,500,000*l.* for the Soudan. Then, over and above returns in the form of land tax and other receipts, Egypt would obtain 60,000,000*l.* for an expenditure of 15,000,000*l.*; there is no reason why a similar

satisfactory result should not be attained in the Soudan by careful and judicious outlay.

The possibilities opened up by the projects discussed are vast almost beyond conception. No doubt the details of the various schemes may have to be modified as further information is rendered available, but the general programme surely indicates the lines of development to be followed. Sir William has clearly earned the gratitude of Egypt by the care and conspicuous ability with which he has created the subject, and, if successfully accomplished, the works foreshadowed in his Report will increase the wealth of the country beyond the dreams of the most sanguine, and at the same time will constitute a splendid monument to the engineering genius of the present era.

THE PRESIDENTIAL ADDRESS AT THE BRITISH ASSOCIATION MEETING.

MODESTLY describing himself as an amateur, Mr. Balfour delivered on Wednesday last week one of the most admirable presidential addresses which has been contributed to the proceedings of the British Association within recent years. The subject chosen, "Reflections Suggested by the New Theory of Matter," necessarily involves the consideration of difficult and abstruse problems, and the task of preparing an address upon such a subject, for delivery before a critical audience, would be thought sufficiently formidable, even by a professional scientist. In his address, Mr. Balfour deals almost entirely with speculative physics. He shows that during the last hundred years the views of scientists have been much modified, not merely by such far-reaching discoveries as the atomic and molecular composition of ordinary matter, the kinetic theory of gases, and the laws of the conservation and dissipation of energy, but by the more and more important part which electricity and the ether occupy in any representation of ultimate physical reality. To-day we have new theories of matter. There are some who think that all material substances, whatever be their outward form, or atomic constitution, are but electricity itself, the atoms themselves being made up of electrical monads. Others go a step farther, and suggest that these electrical monads may be but a modification of the universal ether. Whether this final unification be accepted or not, it is clear that electrical monads cannot be considered apart from the ether, upon which, indeed, the electric theory of matter depends. If this theory be accepted, we must admit the presence of inconceivable amounts of internal energy, confined within the atoms of apparently inert matter. This aspect of the question is admirably expressed by Mr. Balfour in the following words:—"We can then no longer assume that if the internal energy of a sun were as far as possible converted into heat, either by its contraction under the stress of gravitation or by chemical reactions between its elements, or by any other interatomic force, and that, were the heat so generated to be dissipated

as in time it must be, through infinite space, its whole energy would be exhausted. On the contrary, the amount thus lost would be absolutely insignificant compared with what remained stored up within the separate atoms." The stupendous forces lying within and around us, if modern views be correct, may never be of utilitarian value, but they will continue to stir the imagination and to excite the wonder of mankind. All theories of the kind are, however, purely speculative. No one even knows what electricity actually is, nor has the existence of ether been experimentally proved. The unification of physical nature is a most alluring idea, but Mr. Balfour very justly asks whether there is any legitimate reason for expecting that the material world should be a modification of a single medium, rather than a composite structure built out of sixty or seventy elementary substances eternal and eternally different. Reverting to the electric theory of matter, Mr. Balfour shows that it carries us into a new region of thought. In accordance with its teaching, matter is no longer matter, and the atom is merely the theatre in which electrical monads perform their operations. Thus we come to a point which is forcibly expressed by Mr. Balfour in the following manner:—"We claim to found all our scientific opinions on experience; and the experience of which we found our theories of the physical universe is our sense perception of that universe. That is experience; and in this region of belief there is no other. Yet the conclusions which thus profess to be entirely founded upon experience, are to all appearance fundamentally opposed to it; our knowledge of reality is based upon illusion, and the very conceptions we use in describing it to others, or in thinking of it ourselves, are abstracted from anthropomorphic fancies, which science forbids us to believe and nature compels us to employ." Mr. Balfour here puts his finger on a difficulty that cannot be removed until more light is available. Men are still groping for the truth, assisted by a mere glimmering ray of light, and until the hidden secrets of nature are made clear, we must rely for daily guidance upon the phenomena which afford the bases of various departments of applied science. The aspirations of the pure scientist are more exacting than those of the practical scientist. Hence, those who employ matter in engineering and constructive science, may be content to act as if steel, stone, and timber were actually steel, stone, and timber, and to disregard the possibility of their possible electrical or ethereal constitution. We regret that space will not permit more detailed reference to Mr. Balfour's fascinating cosmical speculations, which will be appreciated by all true scientists, even if some of the views expressed may be not entirely accepted.

SHAFTESBURY AVENUE, W.C.—It is stated that Mr. W. G. R. Sprague has been appointed to prepare plans and designs for a theatre, to be erected for Mr. and Mrs. Seymour Hicks, as proprietors, upon the northern side of Shaftesbury Avenue, upon the area bounded by Wardour, Rupert, and Little Rupert streets. The lessee is Mr. Charles Frohman, and the plans will provide for a suite of offices in the upper part of the new buildings.

NOTES.

Live Rails. IN view of the constant occurrence of serious accidents from live rails and overhead wires, it seems clear that the Board of Trade will have to take steps for the protection of the public. Few people will agree with the writer of an extraordinary letter published in the *Times* on the 20th inst., that the public must be educated to take care of themselves, and must leave the pavements at their own risk of treading on live iron covers or rails. This has certainly not been the trend of modern legislation, and although it is true that many of the accidents recently reported have occurred through unauthorised persons trespassing on railway lines, it must be borne in mind that the employees themselves are entitled to protection from unidentified live rails. An unfenced hidden danger, such as this, is entirely at variance with the legislation for factories, under which employees are safeguarded against all dangers on such premises, and on docks and wharves; and we trust similar legislation will soon be passed to prevent this constant recurrence of electrical accidents.

The Motor-dust Problem. NOT only ordinary users of country roads but also the inhabitants of roadside dwellings are beginning to cry aloud for protection from the clouds of dust raised by every passing motor-car. We have ourselves, in common with many of our readers, suffered much from the dust-raising capacity of motor vehicles; but, in spite of personal inconvenience, we are rather inclined to look upon these as blessings in disguise. They have already served to emphasise the fact that our main highways are unsuitable for present-day requirements, and have made it clear that instead of consisting of stone and mud, or stone and dust, according to the season of the year, road surfaces should be consolidated with proper binding material. It is obviously the duty of local authorities and their professional advisers to find materials of construction suited to the requirements of the travelling public. Tar macadam, oiled roads, and roads treated with patented compounds, all afford relief from the dust nuisance, and are available for adoption in all parts of the country. Additional expense must certainly be incurred in connexion with any improved system of construction, and this constitutes the chief difficulty in the way of reform. Non-motorists are fairly unanimous in thinking that motors should be taxed so as to provide the necessary funds; but, on the other hand, motorists contend, and with some show of reason, that the pounding of horses' hoofs, and the grinding action of iron-tired wheels, are the primary causes of the dust, which is afterwards raised by the wind, and by other vehicles, as well as by motor-cars. It seems, therefore, that the proper course would be to tax all classes of the community alike. But whatever be done, the character of our road surfaces must inevitably be changed, and the sooner this truth is realised the better it will be for everyone concerned.

Electricity
and
Matter.

THE article on the "Electric Theory of Matter" by Sir Oliver Lodge, which we mentioned recently in our review of *Harper's Monthly Magazine* for August, is worthy of more than a passing notice. He states very clearly the modern electric theory of matter, and gives an outline of its historical development. Maxwell stated thirty years ago that he was ignorant of the precise nature of electricity, but that possibly it might be a form or aspect of matter. Modern theory goes a step farther and says that matter is composed of electricity and of nothing else. Of the "positive" electricity in matter the theory says little, but of the "negative" electricity it makes many definite assertions. Negative electricity consists of excessively minute particles, generally called electrons. In a vacuum tube these electrons fly from the negatively charged terminal, and when they hit anything the impact is appreciable and considerable heat is produced. It is not easy to stop these electrons. A thin sheet of aluminium is practically transparent to them, but a heavy metal, like platinum, is opaque, and the impact produces both light and Röntgen rays. Radium is continually giving off three kinds of rays. The beta rays are formed of electrons and are identical with the rays in a vacuum tube. The gamma rays are a kind of ethereal pulse similar to light rays, and the alpha rays are formed of atoms apparently belonging to a new substance. By measuring the deflection produced by a magnet on the alpha rays Rutherford predicted that the radium emanation was probably helium, and this has been verified by Sir W. Ramsay. It is natural therefore that scientists should regard the surprising results deduced from the mathematical theory as possibly representing the true facts of the case. It has to be remembered, however, that although Newton's corpuscular theory of light explained practically all the ordinary phenomena of light, yet it failed to survive the crucial test devised by Arago. Hence we should not be surprised if some new discovery did not make a profound modification of the modern theory necessary. It seems to us that the fatally weak point in modern theories is their presupposition of an ether in which the electrons of infinitesimal volume vibrate. We would be the last to depreciate the wonderful work done by J. J. Thomson and his pupils at the Cavendish Laboratory, Cambridge, but there seems to us to be a possible danger that the attractiveness and beauty of the hypotheses may lead scientists to neglect some of the less showy theories of the past which still need to be completed and may furnish results of great practical importance.

The
Buda Pesth
Fire Congress.

ONE of the most useful results of the recent International Fire Service Congress in the Hungarian capital was a series of recommendations, drawn up in the form of a resolution which is to be addressed to all the Governments of the world. The relation of chemistry to fire prevention is very properly emphasised, for fire itself is an evidence of chemical action, which can best be

checked or neutralised by scientific aid. It is recommended that the owners of mills and factories should be required to organise private fire protection services for the extinction of fires in their first stages, that they should be compelled to notify the authorities of all outbreaks occurring on their premises, and that the danger of fire should be systematically combated by the enforced adoption of fire-resisting construction. Due importance is attached to the use of non-flammable materials in theatres and kindred buildings, and to the employment of fire-resisting decorations in such structures. Finally, the universal application of fire-signal systems in all urban, suburban, and rural districts is strongly advised. There is nothing very novel in the foregoing proposals. They are obviously in accordance with the dictates of common sense, but will never be generally adopted unless made compulsory. Hence the chief value of the resolution seems to be that it will bring the whole subject before the attention of those having the power to make laws and regulations.

Recent
Wind Storms
in America.

WE are told that the tornado is an evidence of the process of adjustment by which the atmosphere regains its stability. This may be satisfactory as an explanation, and the final result may be equally so, considering the matter solely from the standpoint of the physicist. But mere spectators, whether they be property owners or not, rarely enjoy the operations by which equilibrium is restored. This opinion is freely entertained in the United States at the present moment, where we are sorry to find severe storms have occasioned widespread damage and serious loss of life. Experience has shown that no structure, however strongly built, is strong enough to withstand the enormous power of the wind in the funnel of a tornado, and the recent evidences of this fact are particularly striking. Last week property to the value of 400,000*l.* was destroyed at St. Paul, Minnesota, and a steel bridge crossing the Mississippi was practically wrecked, one of the masonry piers being cut asunder by the force of the wind. In the city of Minneapolis, although the storm lasted but fifteen minutes, buildings were unroofed, the fronts of houses were blown bodily in, and a lofty building occupied by private inhabitants was blown down, 200 persons being reported as having been killed by the collapse. The violence of the recent storm at St. Paul is shown by the statement that the tornado moved on its course at the rate of 80 miles an hour, a speed quite irrespective of the velocity of the currents in the tornado-funnel itself.

Proposed
Canal
Amalgamation.

PUBLIC interest is slowly being awakened to the importance of preserving and improving the internal waterways of this country. Manufacturers in Lancashire, in Cheshire, in the Midlands, and in the west of England have been working for some time in the interests of the canals, assisted by various Chambers of Commerce and members of Parliament, among whom Sir John Brunner may be particularly mentioned. The question of a

public trust for canals was lately proposed, strange to say, by the chairman of a large railway company, and the same idea was again discussed by Colonel Roys, M.P., at the meeting of the Rochdale Canal Company held in Manchester recently. It is satisfactory to learn from the remarks of this speaker that the Liverpool Chamber of Commerce proposes to take the matter up seriously, and to bring it before the meeting of the Associated Chambers of Commerce in Manchester. The canals touching that centre certainly seem to present favourable features for the arrangement of an amalgamation. A combination of the Rochdale Canal with the Leeds and Manchester, the Bolton and Bury, the Bridgewater, the Calder and Hebble, and the Ashton Catwisp canals would provide facilities for an enormous manufacturing district, of which Manchester is the natural centre. While we do not for a moment wish to imply that this is the only favourable opening for amalgamation, it would certainly be a most excellent field for such an enterprise, especially in conjunction with a well-organised scheme of electric haulage.

The
Water Supply
Problem
in Paris.

IT is well known that the existing water supplies of Paris are not only inadequate in quantity, but that the supply of drinking water is far from satisfactory in quality. Only last week the authorities found it advisable to issue notices to the inhabitants recommending the boiling of all water intended to be used for drinking purposes. The necessity for increased supplies of better quality has long been recognised, and the question becomes more serious year by year. It is satisfactory to learn, therefore, that a deputation from the Municipal Council is now on its way to Germany with the object of ascertaining the methods adopted in connexion with the water supplies of Berlin, Hamburg, Frankfurt, and other large German cities. We do not know whether a similar visit is contemplated to this country, but we think that a week or two spent in examination of the various waterworks of London would well repay the time and expense involved. Considering the comparatively unfavourable character of the sources from which the water of London is obtained and the excellent quality of the water supplied, it is quite evident that the engineering and administrative methods adopted must be thoroughly worthy of imitation by our neighbours across the Channel.

The Convent
of St. Clare,
East London.

THE destruction of the London and North-Western Railway Company's premises by the recent fire which broke out at Haydon-square brings to light some remains that one or two newspapers of last week erroneously described as appertaining to the Priory of Holy Trinity. The fragments consist of two windows and a blocked-up doorway in the wall of Holy Trinity Church in the Minories, which was established there after the dissolution of the religious house of St. Clare, or *Sorores Minores*. The dedication of the church to the Holy Trinity betrays Cunningham and many subsequent writers into confusing the Convent of St.

Clare with the Priory of the Holy Trinity at Aldgate, on the remoter side of Leadenhall-street. The Priory was established by Queen Mathilda in the first decade of the XIIIth century, and as a religious foundation may be said to be now represented by the Church of St. Katharine Cree. The Convent of St. Clare had a later origin, having been founded nearly 200 years afterwards for Sisters of the Order of St. Clare by Blanche, Queen of Navarre, who became the wife of Edmund, Earl of Lancaster. The later name of the neighbouring street is a corruption of Minorettes, by which style the nuns of St. Clare were commonly known.

NOTES AND SKETCHES IN SOUTHERN ITALY.—II.

ASCOLI PICENO.

ASCOLI "Piceno" (for there is another Ascoli near Melfi) is situated in the valley of the Tronto, near the junction of the Castellano with that river, so that the walls rise from a picturesque ravine on both sides of the city, which is pleasantly situated in an amphitheatre of hills, and bristles with many towers, which are more varied in form than those of the celebrated San Gimignano "dello belle torri." It is the ancient *Asculum Picenum*, and still retains many signs of its antiquity. It was the capital of the Picentines, and Pliny says that it existed before the transplanting of the Sabines. According to Florus it was one of the principal cities of the federation of anti-Roman Italy. In 299 B.C., however, Rome allied herself with Ascoli against the Etruscans, Samnites, and Senones, but the weaker party went to the wall and Ascoli was subdued by Rome. It rebelled, and took a prominent part in the Social war, giving the signal by killing the proconsul and other Romans. For this it was sacked by the Consul Strabo, and was afterwards made a *municipium*, and from that time remained faithful to Rome. In mediæval times it belonged to the Lombard League, but after a time became Gibelline. It had a stormy and exciting

history until the end of the XVth century. In 1185 it threw off its bishop's yoke and proclaimed itself a Republic. Innocent III. excommunicated it in 1192, and two years after it returned to its allegiance, but welcomed the Emperor Henry VI. with festival. Then it rebelled against the imperial authority and was sacked in 1242 by Frederick II., so returned to allegiance to the most powerful and was allowed to build a fortress near the mouth of the Tronto, which was completed in three years, and so excited the jealousy of Fermo that long wars ensued between the cities with much damage. After that it struggled to maintain its liberty against Galeotto Malatesta, Francesco Storza, and others. The latter stayed some time in the city and tried to stamp out suspected conspiracies by erecting quite a grove of gallows. In 1482 it bought the right to call itself a Republic from Sixtus IV. at the price of an annual tribute of 3,000 scudi. The usual struggles between the principal families followed, and in 1535 during an *émeute* the Palazzo Comunale with its archives was burnt. In 1540 Paul III. sent a commissary and built the fortress of Porta Maggiore, but in 1555 the governor was killed and the Pope took away every privilege from the town and re fortified the ancient Pelasgic citadel. It regained some of its privileges under Gregory XIII. in 1573, and, except for the excesses committed at the time of the French Revolution, has passed an uneventful existence since then.

The important antique remains include portions of the walls, the Porta Romana anciently called Binata, from its two equal arches standing side by side, through which the Via Salaria passed, and the Ponte di Maestro Cecco, a Roman bridge also belonging to the Via Salaria. Another bridge, with one fine arch bestriding the ravine, called the bridge of Solesta, is also recognised as Roman; a double gate was erected on it on the city side in 1230 to solemnise the peace between Fermo and Ascoli. There are three other bridges, one of which (the Ponte Maggiore), of three arches and 160 ft. high, was built in 1373 by Massimo and Nicoluccio Ravvolto, Ascolan artificers. Near the Porta Maggiore is the fortress built by Galeotto Malatesta in 1349, remade by Antonio San Gallo and now a prison. The fortress built by Pius IV. on the ancient fort called the Cassero is now called "La Pia." There are also some small remains of a theatre

and an amphitheatre, and on the hill above the town the church of the Annunciation, with its conventual buildings (now an agricultural college), occupies the site of the Ascolan baths, and a great palace of the prefect Polimius, the substructures of which are enormous masses of brickwork. The ancient aqueduct has been repaired, and supplies the town with good water. Other buildings occupy antique sites. The cathedral is said to have been built on the ruins of a temple of Hercules: the original substructures are still visible; and S. Gregorio Magno is said to be on the ruins of a temple of Vesta.

The Palazzo Anzianale, the ancient Communal palace, occupies the site of the ancient Palatium Album, the dwelling of the counts and governors, and contains a small museum in which are antique inscriptions, etc., many of which may also be seen incrustated in the walls of houses. It is at one side of the Piazza Aringo, near the Cathedral and Baptistry. The present façade dates from the XVIIth century, but last year the removal of some walls which cut up a portion of the interior into small rooms disclosed the ancient Loggia del Arringo in which the Council of 800 met to discuss public affairs. It is believed to have been built towards the end of the XIIth century, travertine being the material used, though some of the columns appear to have been of brick, plastered. The capitals are cubiform, slightly moulded, as are the bases. There are fourteen columns with corresponding wall pilasters, which support a triple series of round arches about 25 ft. high. The vaulting is quadripartite. The interior of the cathedral has been highly decorated in modern times. In a chapel on the right are several pictures by Crivelli of considerable merit (his pupil, Pietro Alamanni, also worked in Ascoli). The Annunciation by him now in the National Gallery was painted for the Ascolan church of SS. Annunziata to commemorate the concession of communal government by Sixtus IV. which arrived on Lady Day; after which the Annunciation became the official festival of the city. S. Enidius kneels beside the angel and bears Ascoli in his hands.

The town was the outpost of the Pontifical States towards the kingdom of Naples, and has a good deal of XIVth-century Gothic and Early Renaissance architecture in it as befits a place



Ascoli Piceno: Roman Bridge and Mediæval Fortress, now a Prison.



SS. Vincenzo ed Anastasia, Ascoli Piceno.

which was of importance in those times. The church of SS. Vincenzo ed Anastasia illustrated, bears a date, 1389, on a stone by the south door. The side doors are both of this period, but the west door appears to be earlier. There is a clerestory of small two-light windows, four on each side, which have the Byzantine block above the capital and small round arches, and the Campanile, which is contained in the rectangular plan, has similar coupled arches with widely sloping caps. Round arches without mouldings are within, resting on square piers with small impost; the eastern end is apsidal. Another curious church is S. Giacomo, square in plan and without external apse, though the masonry of the east wall shows a large pointed arch. It has a small wheel window in this wall with twisted colonettes radiating to round arches without mouldings. The west door has a damaged fresco above it in the lunette, and resembles that of SS. Vincenzo and Anastasia in design, with two twisted columns in the angles and a dogtooth among the arch mouldings. The design of the scroll of the archivolts is very XIIIth century. The side doors had pent-house roofs and are simpler; all are of the XIVth century. The Campanile here is also contained in the plan, and has round arched openings and a conical top above the cornice.

The great church of S. Francesco at the end of the Piazza del Popolo, built in 1269 by Antonio Viperà, has its façade on the "Trivio." The central door has a fresco in the lunette over the door and foolish lions mounted on pillars at the sides. Ranges of elaborately twisted and chevroned pillars are in the jambs, and the arch is flanked by pinnacles, with four rows of sunken empty panels of curiously varied shapes at the top. Those of the side doors have three rows only. The carving of ornament is rich and rather Byzantine in treatment, using the drill a good deal and sharply cut. At the top of each side-band of ornament is a bull's head. The door on the south is somewhat similar, but is surmounted by a Renaissance addition, with very tolerable effect; close to it is the charming Loggia de' Mercanti, a very pretty Renaissance arcade. The interior is very fine and simple in proportion, spacious and quite undecorated. An arcade of five lofty pointed arches serves the nave, then comes a transept, in which the aisle wall is pierced with a double arched triforium and arcade below. There is an octagonal dome with four large and four small sides, with a blind arcade of pointed arches within and small pendentives below. The apse is six-sided and vaulted, and in three of the sides are simple windows. The vaulting of both nave and aisles is quadripartite,

that of the nave on a higher level, springing from pilaster strips. The lower stories of the two towers which flank the apse open into the church by similar arches to those in the end of the transepts. The window tracery of the side walls much resembles the quaint shapes of SS. Annunziata, Solmona. Externally the effect is fine and masculine, with broad surfaces and few mouldings. The Piazza del Popolo is surrounded by a XIVth-century arcade, reminding one of Verona or Padua. There is but one story above it and then Ghibelline battlements of brick, shown above the Loggia de' Mercanti in the drawing. In the middle of one side is the Palazzo del Comune, restored after the burning in 1535, but still retaining the earlier tower. The Baptistry is very early, probably of the IXth century. The ground plan is a square and at the angle arc pendentives making the upper part octagonal, with an arcade of three arches on each side, except at the west where there are four, beneath a small roof cornice. Beneath each group in the continuation of the square wall is a small window with impost. Below that on the west side a discharging arch shows. There are doors on the east and south sides and a few antique fragments are built into the walls. The roof, of flat slope, is crowned by a little pinnacle pierced with pointed arches. The door on the east is square-headed, has simple mouldings, and is flanked by square-headed panels; above all three features are triangular sinkings. The south door has a round arch with lintel below formed of a fragment of Comacine interwoven pattern; on the left jamb is a kind of cap, on the other rough volutes. The architrave moulding is rather flat, but much more elaborate than in the other door.

Another interesting ancient building is the Casa Longobarda, which appears to be really of the VIIth or IXth century, and retains much of its original appearance. On the upper story there are four double arched windows with central colonettes, the caps to which are queerly shaped and roughly cut, and one has a carved base. One of these windows was ornamented with "scodelle" on the jambs and on the walls near to it. The door is at present round-arched without mouldings, above it is a square-headed window and there is one to the left of the door with sickle shapes and letters carved on the lintel in low relief. The upper windows have a cable moulding and fillet round the arches, and the spandrels of three of them have carvings very slightly modelled, with the ground sunk round the outline. The first has a castle and two anchors, the second two trees, quite modern in their simplicity and lack of design, the third animals and a bunter chasing them. Above runs a twisted band into which

the gargoyles sink. On the side towards the street are also sinkings for "scodelle" and fragments of an interwoven band now displaced. The roof is a lean-to against one of the towers of the mediæval Ascolan nobility, of which there were once 20, with a small square window at the top and ornaments grouped about a round sunk panel. Above the tower door a triangular sunk panel occurs, with a slit across cut through the wall for light. There are many Renaissance houses, both early and late, with delightful picture-frame-like windows carved with arabesques, balconies, and loggias.

Cola del Amatrice, painter and architect, was born in the Ascolan territory, and there a painting by him in S. Francesco, but its most distinguished citizen was Pope Nicholas V. His name was Girolamo di Massio and he was of noble family. He lived long at S. Francesco as a monk and became general of the Franciscans some time before his election to the papacy in 1288. He presented many things to churches and monasteries of Ascoli, and accepted the office of Podestà. The cope which he sent to the cathedral was stolen in 1902, but rediscovered in the collection of Mr. Pierpont Morgan, but S. Francesco still has a cross by him preserved in a reliquary made in the XVth century. The cross is of gilded copper with arabesques in flagee, and the reliquary is of silver gilt with sharply-pointed domes and twisted colonettes on a copper gilt base ornamented with translucent enamels of violet colour. It is the work of the Ascolan Pietro Vanni, whose productions may also be seen at Osimo, Bovino, Amatrice, and Castiglione according to M. E. Bertaux. The treasure of the cathedral contains an altar frontal of silver of the second half of the XIVth century with a number of New Testament subjects in relief in oblong panels, perhaps the work of a local artist; an Italian XIVth-century coffret in ivory, octagonal in plan, and carved with the history of Paris; a reliquary of the arm of S. Emidius, and a silver statue of him at the end of the XVth century. S. Emidius, Germain of Treves, the first bishop of Ascoli, is still the patron saint. The reliquary of the arm is also attributed to Pietro Vanni; it is borne on a high base hexagonally starlike in plan, of silver partly gilt and enamelled. Its length figures are engraved in medallions on a foot. The statue is by the same hand, cast the *cire perdue* process, and delicately chased afterwards. The border of the cope has subjects engraved on it. There is also a silver statue of the Virgin of the second half of the XV century, ascribed traditionally to the Florentine Curzio Compagni, a XVIIth-century Cross designed by Vasari, and an altar for



Ascoli Piceno: Loggia de' Mercanti and Door of S. Francesco.

roidered in silk, with figures of saints, also of the XVth century. At S. Pietro Martire is a beautiful little angel of French XIIth-century workmanship. XVIIIth-century work is not referred to here, but those who like it will find plenty in Ascoli. F. H. J.

THE ARCHITECTURAL ASSOCIATION EXCURSION.*

Thursday: Milton Abbey.

The train was taken from headquarters at Sherborne to Blandford station, where the brakes of the party. Passing through the town the country is soon reached, and a drive through some really beautiful scenery took the party to the beech woods surrounding Milton Abbey, the church and house nestling together and partly surrounded by lawns and shady groves. The party were shown over the House and Abbey Church, which, from the absence of a nave, probably reminds one of the collegiate churches of Oxford. Nothing now remains of the town which once stood grouped round the Abbey, and to-day the deer peacefully browse over the site formerly occupied.

Early in the reign of King Athelstan a monastery was founded at Milton. This King, at the beginning of his reign, owing to false suggestions that his brother Edwin was plotting just his life, caused him to be sent to sea in an open boat, with only a single attendant. Prince, overcome with despair at his danger, jumped overboard; but his attendant, amid great anger, swam ashore with the corpse. The King, repenting, did seven years penance at the spot and afterwards founded the Abbey. Whether this legend be true or not one cannot say, though much doubt has been thrown upon it. Considerable remains of the Abbey may still be traced, and it does not appear to have been treated with the ruin and havoc which generally attended religious houses immediately

after their dissolution. It formed a long square and stood upon somewhat rising ground, close by the church. The north front, according to Hutchins' "History of Dorset," was a very low, ancient row of buildings with small narrow windows, probably the monks' dormitory. You entered by a large gate into a small court surrounded by irregular buildings; passing this you entered the hall through a porch. This hall, which still exists, is a stately and magnificent old room, almost exactly a double cube: it is 53 ft. in length; at the higher end is a date, 1498, when the building underwent repair. Fortunately when the House was rebuilt by Sir William Chamber this old hall was judiciously preserved, and is in its original state, with a splendid hammer beam roof in six bays, with moulded and curved supports to its purlins; the intermediate trusses are supported by lions. It is a very perfect specimen of a monastic refectory. In one of the rooms hangs a most interesting plan, "An exact Survey and Plan of the Manor of Milton Abbas, 26 Aug. 1652, Philip Byles surveyor." The Abbey Church was restored in 1865 under the supervision of Sir G. G. Scott.

Piddleton Church.

Here the party had luncheon amid somewhat homely surroundings, and the brakes drove to the town of Piddleton, where the church was inspected. It consists of a chancel, nave, and south chapel, the tower being on the west side. The font is an interesting example of unusual form, with an interlaced diaper pattern, possibly dating from the XIIth century. The interior is very quaint, and the original disposition of Jacobean pewing, recalls the days of our great-grandfathers and the long discourses they were obliged to listen to. The south transept arch is panelled exactly like Sherborne Abbey, and, indeed, this characteristic was very noticeable in several of the churches visited, all of which had no doubt obtained their inspiration from this great mother church. The windows are of good tracery and irregularly spaced. On the south side of the nave an

extremely interesting chantry contains several monuments to the Martin family, with several remarkable alabaster figures; one especially under the nave arch is of great interest to the student of armour, and dates from the latter part of the XVth century.

Waterson House.

From here the drive was continued to Waterson House, where the party were entertained to tea. This house is said to have been built by Thomas, second son of the first Viscount Bindon; later it belonged to Sir John Strangways. The house is three stories in height, with gables and a high-pitched roof. On the south side is a Jacobean porch with round archway flanked on either side by Doric columns; above, the porch supports a quaint semi-circular bay running to the second story and surmounted by an open balustrade. On the east side of the house is an interesting gable of Jacobean design, which has been unfortunately much marred by later insertion of square windows.

After inspecting the House, the party drove on to Dorchester, where the train was taken to Yeovil, and a drive of a few miles brought the party to their headquarters.

Friday: Yeovil Church.

This was the red-letter day of the excursion, and an early start was made from Sherborne for Yeovil, where the party visited the parish Church of St. John, situated in the older part of the town. It dates from an early period. The building now used as a sacristy is of Early English date, but the main fabric is principally Perpendicular in style. The tower is at the west end, and there is a wide nave, with aisles, transept, and a chancel of considerable length. The tower is of a simple design without the usual pinnacles. The parapet is rather different from the ordinary type, and consists of perforated panels with cusped heads. The nave of the church is on a level with the chancel. The same treatment is apparent in the aisles, the windows being in recesses between the stone shafts which support the roof trusses. The church is well lighted with five-light windows, owing to which feature it has been termed the "Lantern of the West." The nave arcade is of slender proportions, and is continued through the entire length of the choir but not the chancel. The brass lectern is an original one of a fine bold type.

Tintinhull Village.

The drive was then continued to the quaint village of Tintinhull, a typical medieval village, just over two miles from the ancient town of Ilchester. The Fosse-way runs from one end of the parish to the other. In the time of Edward the Confessor the manor was held by the Church of Glastonbury, though how it became in her possession is a matter only of conjecture. There are a very complete set of church records, which shed much light on the history of the place, dating from the early XVth century. The church is a very small one, without aisles. The tower is situated on the north side of the nave. The principal features are Early English, but some of the windows belong to the perpendicular period. The porch has a simple arched stone roof, with massive ribs. Many of the hench euds are ancient. Adjoining the churchyard a gateway leads to the rectory, part of which appears to be of early XVIIth century date.

Then some of the party visited an old house in another part of the village, quite a gem of its period, originally an early XVIIth century building; a classic front was added possibly in the days of the Woods of Bath, or even earlier. It recalls the best classic traditions of Inigo Jones; the windows have mullions and transoms. The whole is surrounded by a charming formal garden, which owes much to the taste of its present owner. On the west front are two grass courtyards, with good stone piers, and hard by is a howling alley, with several other enclosed gardens. The delights of colour kept many of the party at this house, but others found much of interest in the old-world village and varieties of cottage buildings. A halt of about two hours was made here, and then the excursionists drove on to Montacute, where Mr. Phillips most hospitably entertained the party to luncheon.

Montacute House.

On one side of the village green is the entrance to Montacute House, and following an avenue we find ourselves before the beautiful west porch of the mansion. This consists of an ogee arch surmounted by a beautiful panel of richly-carved Italian workmanship; two

* Concluded from last week.

vigorous putti support the armorial bearings of the house, set within a lozenge; angle columns, rising to a quatrefoil parapet, are surmounted by fantastic statuettes upon twisted columnar bases. The craftsmanship displayed in the enrichments is of a most delicate and elastic character. The whole front shows by its refinement of detail and simplicity the very best traditions of the period. This porch and its adjoining wings were brought from Clifton Maybank House, which was visited on Wednesday. Extracts from the manuscript accounts of the building are still preserved, wherein the then owner of Montacute says, "1786. On May 2, my wife and self attended the sale of materials of Clifton House, then pulling down. We bought 600 ft. of plain ashlar stone for Cattistock—the porch, arms, pillars, and all the ornamental stone of the front—to be transferred to the intended west front of Montacute, besides which we purchased the chimney piece in the withdrawing-room, some windows, some wainscote, lead, marble, etc." "1787. Proceeded briskly with my building the west front, and on June 16 I was enabled to pull down the scaffolding. This year was remarkable for building the west front of Montacute." It is not often that an addition annexed to an old building in this fashion is a success, but certainly in the case of Montacute the addition has added much to the appearance of the façade.

Montacute House was built by Sir Edward Phillips, Queen's Sergeant, Master of the Rolls, and Speaker of the House of Commons. The famous quarry of sandstones on Ham Hill, not many miles away, supplied the material, and the building operations extended over a considerable period, having been commenced in 1580, and only finished twenty years later. The plan of the house is simple, being that of the letter H. The two long fronts face north-west and south-east. What perhaps strikes one most is the great height of the building; it has four floors, all of them containing noble rooms. The balustrade of the before-mentioned addition to the west front is broken by a series of griffins and other heraldic animals, supported on fluted and twisted shafts, with mouldings giving a sharp and brittle appearance to the façade. The designer has also very successfully succeeded in breaking the sky-line with an effective open balustrade, with the usual Elizabethan pyramid blocks on the intermediate piers. The long, narrow, lights of the windows serve to emphasise the lofty character of the building. This is particularly noticeable in the south-east front, where considerably more than one-half of the entire front consists of window space. The two projecting wings of the south-east façade enclose an oblong paved space raised slightly above the garden level. Above, in niches, is a series of the nine worthies. The great size of the house gives evidence of the hospitality our forefathers of Queen Elizabeth's days knew so well how to dispense, aptly illustrated in the two inscriptions: one on the front entrance, "And yours my friends," and another over the garden porch, "Through this wide open gate, none come too early, none return too late." There are many fine old family portraits in the house, and at one end of the great dining hall the old Somersetshire fashion of Skinmetry or Skimmenton riding is depicted, in which the victim for certain misdeeds is condemned to be carried round the village on a pole. We were told that this custom had not yet entirely died out. The party were shown round the interior of the house, and the great gallery on the top floor with its two huge semi-circular oriel windows was of great interest.

In the house is preserved a rare specimen of the handwriting of Inigo Jones, being a receipt for 100*l.* paid to him by Sir Edward Phillips, Master of the Rolls, for money disbursed in connexion with a masque presented before the Court at Whitehall in 1612.

The garden is one of the greatest of Montacute glories; moreover, it has attained an exalted place in the annals of English gardenage. Though by no means of large extent, its design embodies many of the best features of the age of its creation, and very successfully combines the architecture and character of the house with the immediate surroundings. The wing walls thrown out from the main building, the noble terrace overlooking the lower garden, the old-world pond, with its balustrade and fountain, and the quaint pavilion, all reflect the architectural style of the house. Avenues

extend across the park in several directions, the two principal ones leading to the two principal courts. The present entrance is on the north-west side of the house. The former entrance forecourt was on the opposite or south-east side. This court now, diverted from its original purpose is enclosed on all sides, but old drawings show the wing walls extending beyond the garden-houses into the park. These enclosing balustraded walls are about 7 ft. high, with piers placed at short intervals, enclosing obelisks. Mid-way between the main building and the garden-houses the continuity of the wall is interrupted by small circular stone pavilions, each consisting of six stone pillars, supporting an ornamental soffit, with open cupola above, formed of three stone ribs joining at the top. This is again surmounted by a finial of interesting stone circles. The garden-houses are very quaint and beautiful specimens of their kind, and their equals could hardly be found in England. The beautiful tints of the lichen-covered walls, the greys and greens of the ogee-shaped slated roofs, their round bays, pillared angles, and curiously-shaped parapets, make a very beautiful picture, and one which not a few of the party made more than a mental note of. The upper garden extends on the south-west side of this court, and on the opposite side is a large sunken garden, overlooked by a broad terrace, extending around all four sides. In the centre is a fountain pond, enclosed by a balustrade, its angles accentuated by obelisks, round which a happy colony of white pigeons ceaselessly flutter to and fro. So enamoured were the party with the charms of the Jacobean architecture and the lovely garden, that the whole of the afternoon was spent at Montacute House, but some few found out other interesting features in the village grouped round the green not far from the house.

The Priory was founded by William, son of Robert, Earl of Moreton, half-brother to the Conqueror; it has now almost entirely disappeared, the only remains that now exist being the old gatehouse.

The founder owned a castle on the conical hill—"Mons acutus," from which the name of Montacute is derived. Reginald, Chancellor to Henry I., enlarged the monastery, and at the same time converted his castle on the hill into a chapel, dedicated to St. Michael. Scattered round the neighbouring fields are many remains of the ancient abbey foundations, and no doubt Montacute House itself was largely built from the ruins. The gatehouse appears to have formed part of a suite of offices, for it has spacious apartments on the east side consisting of two stories, and also a handsome chamber over the gateway. The gateway is very high, probably so constructed for the hay waggons coming to the Abbey farm. On the south front are two octagonal turrets, the lower one leading to the first floor of the adjoining house, the other to a room over the arch and to the leads. Montacute was the only Clunian house in Somersetshire, and before 1415, when the alien priories were suppressed, Montacute, on renouncing its allegiance to Cluny, was allowed to continue its work until the general suppression in 1539.

The church at Montacute has a splendid Perpendicular tower, which has been added to its west end; it is not so tall or stately as many of the Somersetshire towers, but the work is very graceful; a staircase turret runs up the whole way and springs from the ground.

The church itself is, however, essentially of an earlier type, and has a good Norman chancel arch of three orders. The principal part of the church belongs to the Transition period between Early English and Decorated; the south transept arch belongs rather to the former style, the north to the latter. Probably all are parts of one renovation, between the accomplishment of the various portions a great deal of time being allowed to elapse.

Not far from Montacute is the diminutive village of Odcombe, the native village of the celebrated traveller Coryat, who upon being shown the palace of the Elector of Cologne at Bonn, and asked whether there was any palace in England equal to it, said, "There is one in mine own county of Somersetshire, even the magnificent house of my most worthy and right worshipful neighbour and Meeenas Sir Edward Phillips, now Master of the Rolls, in the town of Montacute, so stately adorned with the statues of the nine worthies, that may be at least equally ranked with this of Bonna if not something preferred to it."

Preston Plucknett.

Next the party drove to Preston Plucknett, where there is a fine old mediæval house, the earliest part of which dates from the latter half of the XIVth century. Owing to alterations made in the interior, many of the most interesting features have been destroyed, but in the exterior an elegant octagonal chimney, with open work at the top, has been preserved.

Close by the house is a barn standing at right angles; it is a fine specimen of the XVth century. The roof is the original one, and is in good condition; it is very probably of Spanish construction. Part of the old finial on the apex of one of the gables still remains. This is also the site of a grange of Bernondsey Abbey. The remains form a very picturesque group of buildings, especially the hall, groined porch, and the barn. There is also an octagonal chimney with double tiers of pierced panels, now no longer in use.

This little place, quite one of the tit-bits of the whole excursion, practically completed the visits away from headquarters, and Friday evening was spent in the usual convivial manner. After dinner a smoking concert was held in the Digby Hotel, and votes of thanks were passed to the President of the Association for having presided over the meeting and also to the two honorary Secretaries, whose indefatigable energy contributed so largely to the success of the tour.

Sherborne.

Saturday was devoted to seeing the sights of Sherborne, as most of the members were obliged to leave during the afternoon, and first of all the grand old Abbey church was visited.

A good deal of information with regard to the archaeology of Sherborne Abbey was contributed by Professor Willis to the *Journal of the Archaeological Institute*. As it now stands, Sherborne is externally a rather lofty, though not very long church of late date, built of freestone from Hamdon Hill and quarries near the town. Here and there Norman details are apparent in the exterior, and more especially in the interior, the crossing arches being Norman except the east one; but there is much more Norman influence in the interior even as it now stands than is apparent at a glance. The early foundation is of the Saxon period, and to that succeeded in due time the Norman church, of which there now remains the crossing piers and the portion of the tower below the roofs, the lower stage of the south-west porch and some minor portions. A Lady chapel was added in the Early English period. About 1436 the work of rebuilding the choir was commenced on the Norman foundation, and also a new upper stage to the tower, and it was about this period that a fire took place which was a notable incident in the annals of the church. The church has been restored under the supervision of Messrs. Slater and Carpenter. The interior of the nave, which has been very carefully restored, presents a fine and unusual effect. It has exceptionally solid arcades of the Perpendicular style. The impost is marked by a small eap to one of the roll mouldings on either face, a rather unusual treatment, and one so small that it hardly strikes the eye. The wide hollows in the piers are given an unusual effectiveness by being made to assume the appearance of a succession of shallow niches by the introduction of trefoil heads at regular distances. The unusually massive character of the piers for their date arises from the fact that, as at Winchester Cathedral, a great proportion of the masonry of the Norman piers was retained as a core and cased with the later stonework. The vault is a remarkably fine and effective one of the date when the assemblage of ribs was just beginning to suggest the form of a complete fan vault, the plan of the main compartment assuming a polygonal form. The crossing is wider from north to south than from east to west; on three sides it has Norman arches with plain square soffits, springing from caps of the ordinary type, with coupled wall shafts below; the western arch is segmental, the north and south ones stilted. The north transept is very similar in character to the nave; the south transept has a fine, massive timber roof of larch. The great south window of this transept was designed by Pugin. The tower at Sherborne has gone through many perils, and in 18 measures had to be taken to preserve it, and to secure the safety of the peal of bells which is said to be the heaviest swinging peal in England (The largest bell weighs nearly 3 tons.) In an issue of April 3, 1897, we published an account

of the Abbey, together with a plan and exterior view.

The domestic buildings of the Abbey were arranged on the north side on a site now occupied by the Grammar School; the principal buildings were grouped round the cloister court, in the centre of which stood the conduit, now removed to the market place. The cloisters were built by Abbot Frithie in 1349-1371, but almost all traces of them have now gone and their position is occupied by the lawn of the headmaster's house. On the east side of the cloisters stood the monks' dormitory with chapter house below, the day room, parlour, and slype; on the north side were the refectory, abbots' lodging, and kitchen, and the west side was entirely taken up by the Guesten hall. The original Sherborne school occupied a site at the east end of the Abbey church. The present building dates from 1670, when the Governors began to rebuild the schoolroom, which had existed since 1555. It is supposed that the foundation of the school is contemporary with the Abbey, and therefore in 1905 the school will have been in existence 1200 years. In 1540 the old schoolhouse of Sherborne was granted by Henry VIII., together with the rest of the monastery, to Sir John Horsey, who afterwards sold the Abbey church to the town, and the monastic buildings were leased to the Governors of the school. In 1550 Edward VI. refounded the school upon the petition of the townsmen and inhabitants of the whole neighbouring county.

Next the castle was visited by a few members who were more archaeologically inclined, but there are not very extensive remains to be seen now. This closed the programme of the tour, which many members will number amongst the most interesting which have been undertaken.

PLAN OF JUMIÈGES ABBEY.

By the kindness of Mr. Phœnix Spiers, who has supplied us with the materials, we are enabled to give this sketch plan of Jumièges. Illustrations of the building appeared in our issues of August 6 and 13.

THE DRAINAGE OF A HOUSE.*

SO LONG as cast iron pipes can be kept free from corrosion they may be regarded as being satisfactory for drainage purposes. Corrosion, however, soon sets in, with the result that the velocity of flow of the sewage matter in the pipes is seriously impeded, and the efficiency of the drain is lost. To counteract corrosion several expedients have been adopted, of which the best known is Dr. Angus Smith's solution; then there is the Bower-Barff process of forming a magnetic oxide of iron on the surface of the pipe; and lastly, by lining the pipe with what is termed *glass enamel*.

A short time ago the writer got the various

* Part of an abstract of a paper by Mr. Samuel Smith, read at the recent Glasgow Congress of the Sanitary Institute.

preservatives on cast iron pipes tested with a weak solution of sulphuric acid, and the following are the results:—

The first experiment was made on a glass enamelled pipe, and, on being immersed in a 1 per cent. solution of acid, the enamel was immediately affected, and at the end of twenty-four hours the enamelled skin resembled a piece of damp blotting-paper.

The next experiment was made on a pipe treated by the Bower-Barff process, but this time a weaker solution was used, 1 part acid to 200 parts water, and the result was that all the oxide was removed. The acid acted upon the pipe whenever it came in contact with it.

The last experiment was made on a pipe coated with Dr. Smith's solution. This pipe was also immersed in a 1/2 per cent. solution, and at the end of twenty-four hours the skin was all peeling off.

It may be argued that a system of house drainage is not required to stand the action of acids, and that the above tests are no guide as to the suitability of cast iron pipes coated with one of the preparations mentioned for the carrying away of soil and waste from our dwelling-houses. The writer, however, holds the opinion that a drain should be able to stand the action of any liquid which may be poured into it. No objection on this point can be made against fireclay pipes, if first quality pipes be used. At the same time as the experiments were made on the cast iron pipes, a fireclay pipe was immersed in a 5 per cent. solution of acid, and the acid had no effect on either body of pipe or glaze.

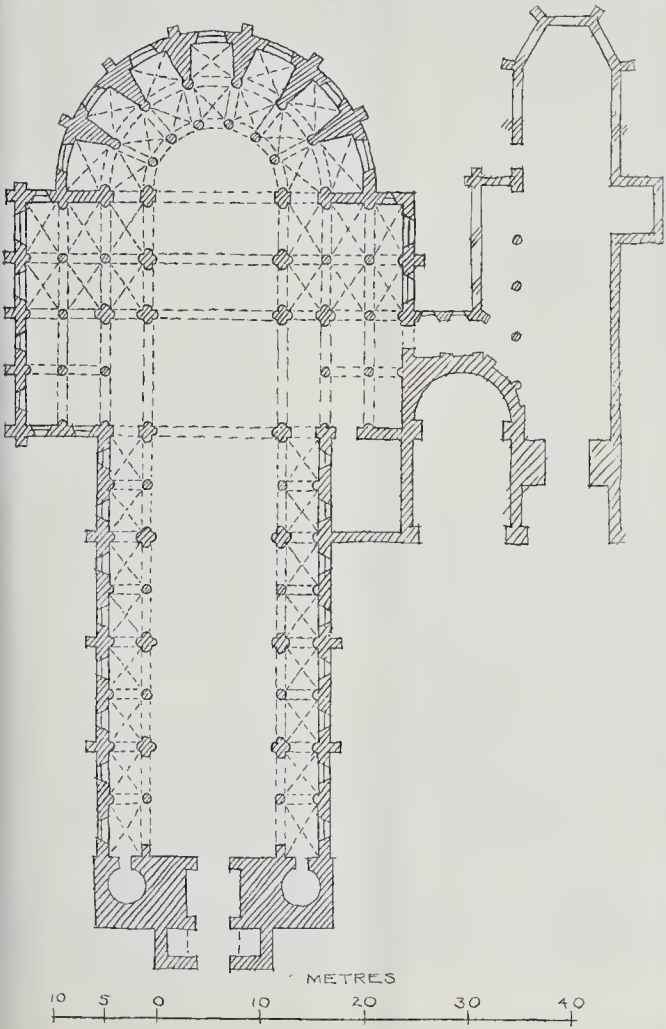
An advantage of cast iron over fireclay piping which is brought forward is the ability of cast iron piping to stand hydraulic pressure; but is this required? The following tests to find the pressure that a drain pipe requires to stand, and the strength of a fireclay pipe, were made for the purposes of this paper:—

A wash-down closet was tested with a pneumatic pump and the pressure found necessary to break a water seal of 2 in. deep was 120 lb. per square inch, while to break a seal of 3 in. deep required a pressure of 145 lb. per square inch. A 4-in. diameter fireclay pipe was tested up to a pressure of 45 lb. per square inch, but showed no signs of porosity at the faucet. This test showed that a fireclay pipe will stand a heavy internal air pressure before bursting, but to find the exact pressure that a pipe would stand and still be air-tight another pipe of the same size was taken and tested. The pressure was gradually increased at intervals of ten minutes, from 5 lb. till a pressure of 3.3 lb. was reached, and the mercury in the manometer remained steady at that pressure for twenty-four hours. From this we may judge that this pipe was capable of standing a pressure of 3 lb. per square inch, or fully twenty times the pressure required to break a 3-in. seal of a wash-down closet. This is a sufficient margin for all practical purposes.

To test the efficiency of embedding a fireclay pipe in concrete, a second quality pipe was put under a pressure of 5 lb. per square inch, but it was so porous that the mercury in the manometer fell 3.5 in. in twenty minutes. The pipe was then encased in 6 in. of concrete, and, at the end of three days, the test was again applied with the following result. The pressure was applied gradually at intervals of half an hour, commencing with 5 lb. of pressure. There was no sign of leakage up to 3 lb. of pressure, but when 4 lb. per square inch of pressure was applied, the mercury fell 1 of an inch during half an hour. From this it will be seen that a 6-in. layer of concrete round a pipe makes the pipe sufficiently air-tight.

A further test of the strength of fireclay pipes was made, this time by hydraulic pressure. They were tested up to a pressure of 250 lb. per square inch without showing signs of fracture, but showed signs of porosity in one pipe at 60 lb. of pressure, and in another at 100 lb.

Another argument against the use of fireclay pipes, is their liability to fracture through any unequal settlement of the ground on which they are laid or of the building they pass through. The liability to fracture through unequal settlement of the ground on which they are laid may be overcome by the laying of a bed or layer of concrete underneath the pipes, and if the ground is very soft or unequal, the writer would suggest that by the use of ferro-concrete it may be overcome. If sufficient size of openings is formed or left in the walls, and these openings are properly linteled over with a space between the lintel



Jumièges Abbey.—Plan.

and the pipe, there is no fear of any damage being done to the piping through any settlement that may take place in the building.

Another point of importance in connexion with the laying of fireclay pipes is the nature of the joint and the material to be used for making the joint. By the introduction of faucets such as the Hutcheson or the Fitzpatrick faucets, a more satisfactory joint can be made than is possible with the ordinary spigot and faucet pipes, even although rope-yarn is used. The writer recommends that nothing but a slow setting cement, thoroughly cooled and aërated, be used, and that it will be well staved into the joints so that all the air in the cement be forced out, and a thoroughly air and water-tight joint will be the result.

We are all familiar with the objections to cast iron being used for the trunks of elosets and for sinks. The same objections can be applied even more forcibly against the use of cast iron pipes that are to be buried underneath the ground, when fireclay pipes, as has been shown, can be got which will make a tight enough job and be more satisfactory, as there is no fear of corrosion, and you can empty any kind of liquids into them with no fear as to the result.

While efficiency is the point to be looked at in planning a drainage scheme and selecting the materials for the same, the question of cost has also to be taken into consideration. On looking into the comparative costs of fireclay pipes laid in the manner here suggested, including costs of concrete, and of cast iron piping coated with Dr. Smith's solution, or straight piping, exceeds that of fireclay by from 15 to 20 per cent. The increase in the cost of bands and branches is 50 to 60 per cent., while on traps it is 300 per cent. It will thus be seen that, for a drain laid with fireclay piping, the advantages of being more efficient and economical can be claimed.

The writer would suggest that fireclay pipemakers test their pipes to say 60 lb. of hydraulic pressure, and sell their pipes with a guarantee that they will stand that test. If this were done the users of pipes, in the knowledge that they were getting a satisfactory article, would readily pay an additional 10 per cent. on the cost of them, and the result would be more satisfactory to all parties concerned. Improvements have been made in recent years on fireclay pipes, and further improvements could and would be made if makers saw that it was to their advantage to do so, through there being a demand for a superior article.

Illustrations.

ST. GEORGES DE BOSCHERVILLE.



THE chronology of the Church of St. Georges de Boscherville has been much disputed. De Cammont held that the present church is that which was built between 1050 and 1066 by Raoul de Tancarville, and the French Society of Archaeology in 1849 put up on the aisle wall a marble slab with an inscription to that effect. But a comparison with such early Romanesque work as that of Bernay and Jumièges makes this date entirely inadmissible. A more advanced date was proposed by Georges Bouet in an important paper on the church in the "Bulletin Monumental" for 1867, and has lately been accepted by M. Besnard—viz., that the church was built between 1075 and 1090. In opposition to this, it may be urged that it is far more advanced in style than St. Nicholas, Caen, which is known to have been built in 1083; for the style of work there would seem to be an interval of twenty or thirty years between St. Nicholas and St. Georges. Characteristic features of XIIIth century work abound. The church is admirably lighted, the windows and the bays being broad. The joints of the masonry are fine. The piers have their members scientifically disposed with reference to their load, six columns supporting the two orders of the pier-arches, one the transverse arch of the aisle vault, the remaining one being carried up as the roofing or vaulting shaft. Throughout the church the tendency is not to carve but to mould each arch; those of the crossing, the ground story, the transept galleries, the triforium, the clearstory, and many of the windows have roll-mouldings of considerable refinement, such as may be paralleled perhaps at Norwich, but hardly in Normandy. The capitals, too, are of advanced type; the scalloped

cap is frequent, and Corinthian capitals abound of much higher type than those normal to Normandy in the XIth century, which consisted of little more than four clumsy volutes, with the band of acanthus usually omitted. Nearly all the bases also have the spur-ornament, which in England, at any rate, is rare till the XIIIth century is well advanced; those of St. Peter's, Northampton, which can hardly be earlier than 1135, and the crypt of St. Peter-in-the-East, Oxford, are early examples. M. Besnard appears to see the force of this cumulative evidence for a XIIIth century date. He tries to dispose of it by assuming a general *rajeunissement* of the whole church at a later period than 1090; but though this might apply to the carving of capitals and archivolts, it can hardly be assumed that the windows were enlarged and the arches moulded at a later period; in any case, wide joints of the XIth could not be converted into fine joints of the XIIIth century. And, as we know that William, son of Raoul de Tancarville, supported by Henry of England and Archbishop Geoffrey of Rouen, "volens ecclesiam sancti Georgii ampliare et meliorare," converted the collegiate establishment of secular canons into a convent of Benedictine monks in 1114, it is probable that this gives us the initial date for the building of the church. But since the monks, requiring dormitories, refectory, etc., at once, may have first built their claustral buildings, retaining for a time Raoul's XIth century church, the present church may quite possibly be a work of the second quarter of the XIIIth century. In our own country, when regular were substituted for secular canons at St. Frideswide, Oxford, where there was an existing church still probably in substantial repair, it was the claustral buildings that were built first.

In the interior the XIIIth century vaults are not shuttled by flying buttresses, reliance being placed on the great thickness of the Romanesque walls. The disposition of the vaulting shafts is exceedingly curious. At present each one appears to terminate at the sill of the clearstory, but in reality every other shaft is continued through the vault up to the top of the clearstory wall, so that the vaulting shafts originally were alternately long and short. Of the shorter vaulting shafts in the nave the fourth and sixth have retained Romanesque capitals. All the others have had new capitals inserted when the present vaults were built. It would follow that originally the tall vaulting shafts supported tie-beams, but that the short ones carried gabled semi-circular transverse arches. The same roofing system was in use at Cérisy-la-forêt and at St. Vigor, Calvados. The treatment of the triforium stage also is remarkable. Instead of the great cavernous arches of Cérisy and St. Stephen, Caen, the arcade consists of four arches not embraced under a containing arch; and, owing to the omission of this latter, the triforium stage is low; so the proportions of the interior are rather those which later found favour in the Gothic interiors of the Ile de France and in England at Westminster and Beverley, where the triforium tends to occupy one-sixth, the clearstory one-third, and the ground story one-half of the internal elevation, rather than those which were more usual in Romanesque churches. It is to the ratio of the dimensions of the three internal stories that the success of the interior of St. Georges is largely due. We may compare the triforiums of the Abbaye-aux-dames, Caen, and of St. Saviour's, Southwark. Again, like the Abbaye-aux-dames and unlike the Abbaye-aux-hommes, Caen, there are no windows in the back wall of the triforium. All this is characteristic rather of XIIIth than of XIth century design. It is curious that in the nave the triforium arcade consists of a series of cells neither communicating with one another nor with the triforium chamber behind.

As regards the supports, none of the shafts are carved, none are grooved or banded, all are smooth. This may be because they are not monoliths, but in coursed masonry. In the ornament employed the predominant motives are the fret, chevron, and cable. The bases are mainly variants of the Attic base, and are remarkably clumsy, both in design and execution. The windows are of uniform design, with shafts in the jambs, both externally and internally. The buttresses of the aisles and clearstory are flat strips rising to the eaves, and their angles are shafted, as at Norwich and Peterborough; the apses have columnar buttresses. In the aisles, clearstories, and

transepts the abaci of the window shafts are continued as strings; there is also a continuous string beneath the aisle windows. The corbels of the corbel-table present a great variety of bold Romanesque sculpture. The orientation of the church is from south-east to north-west. The most important work on the church is the quarto of M. Besnard, architect, published in Paris, 1890. It contains plans, sections, and many engravings; the text is full and accurate; the plans are without scale, do not agree with the text, and contain inaccuracies. A valuable criticism of M. Besnard's monograph, by Dr. Coutant was published in 1899 at Sotteville-les-Rouen. Plans and sections are also given in the second volume of Ruprich-Robert's "L'Architecture normande." The illustrations of St. Georges in Cotman's "Normandy" are useful, having been taken before an unnecessarily drastic restoration, in which the plaster was stripped off, the ashlar, columns, mouldings, and sculpture worked over, and the jointing emphasised—one of the evil deeds of the Commission of Historic Monuments.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.

THESE sketches are given in connexion with the annual excursion of the Architectural Association, our report of which is continued this week on another page.

A COUNTRY HOUSE.

THIS house was designed for a site near Havant, on the main road between Chichester and Portsmouth.

The reception-rooms look south towards the sea—six hundred yards away—and one end of Hayling Island.

The garden extends from the house to the shore. There is a walled garden on the west and a kitchen garden and stables on the east.

The walls are of red brick with thick joints; the windows are either leaded lights in iron casements with stone jambs, etc., or wooden double-lung sashes painted ivory white, and the roof is tiled.

CHARLES J. BATHURST.

Correspondence.

UPSALA CATHEDRAL, SWEDEN.

SIR.—In the Cathedral of Upsala, Sweden are a number of sepulchral monuments, two at least of which are of considerable interest.

The Lady Chapel, east of the choir, is the burial place of Gustavus Vasa. His monument is a massive altar tomb of large dimensions on the top slab of which are three recumbent effigies, the centre one being Gustavus himself, and on either side two of his wives. The cart is about 1565. The style of the monument is thorough English Renaissance, and the material English alabaster from Chellaston, Derbyshire. The sculpture is good, and the orphrey enrichments on the dresses are of precisely the same delicate character as we find on Queen Elizabeth's, Mary Queen of Scots', and similar monuments in Westminster Abbey and elsewhere in England.

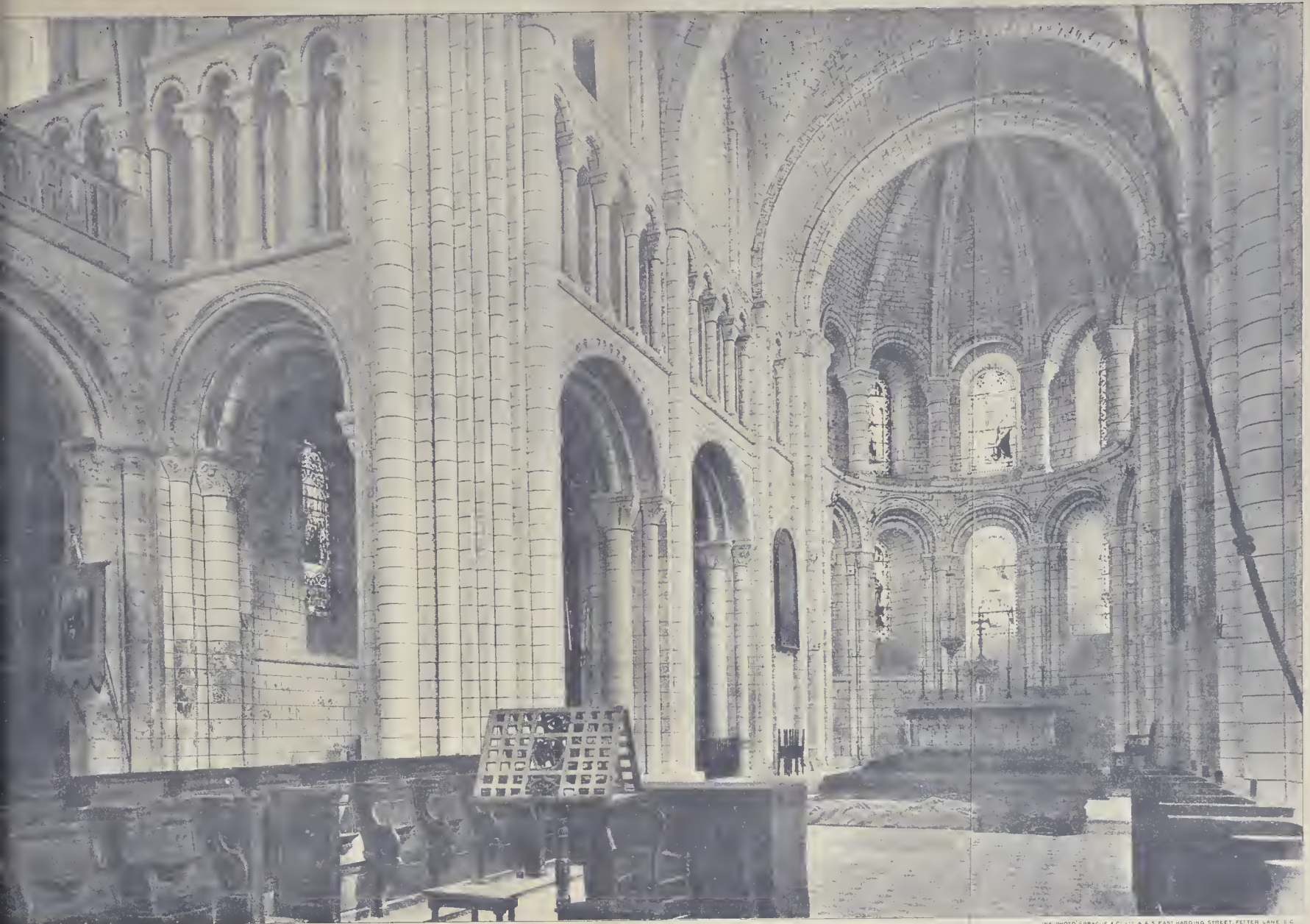
The other of special interest is a large and pedestal monument, with statues life-size of John III. This is said to be in marble, and is stated in the guide-books, etc., as having been executed in Italy in Italian marble. It is supposed to have been wrecked on its way from Leghorn to Sweden, and, after various vicissitudes, to have finally reached Upsala.

Now, my firm opinion about this monument is that it is the same as the first—viz., the material is English alabaster, and the workmanship English. Sweden has no alabaster rocks, and the material is not Italian.

I could imagine that from medieval times to the English Renaissance there was probably a Chellaston, Derbyshire, a continuous "atelier" of sculpture; and it is a question if the same remark does not apply to the Isle of Purbeck and statues in Purbeck marble, which have precisely the same mannerisms wherever found in places however remote. W. BRINDLEY.

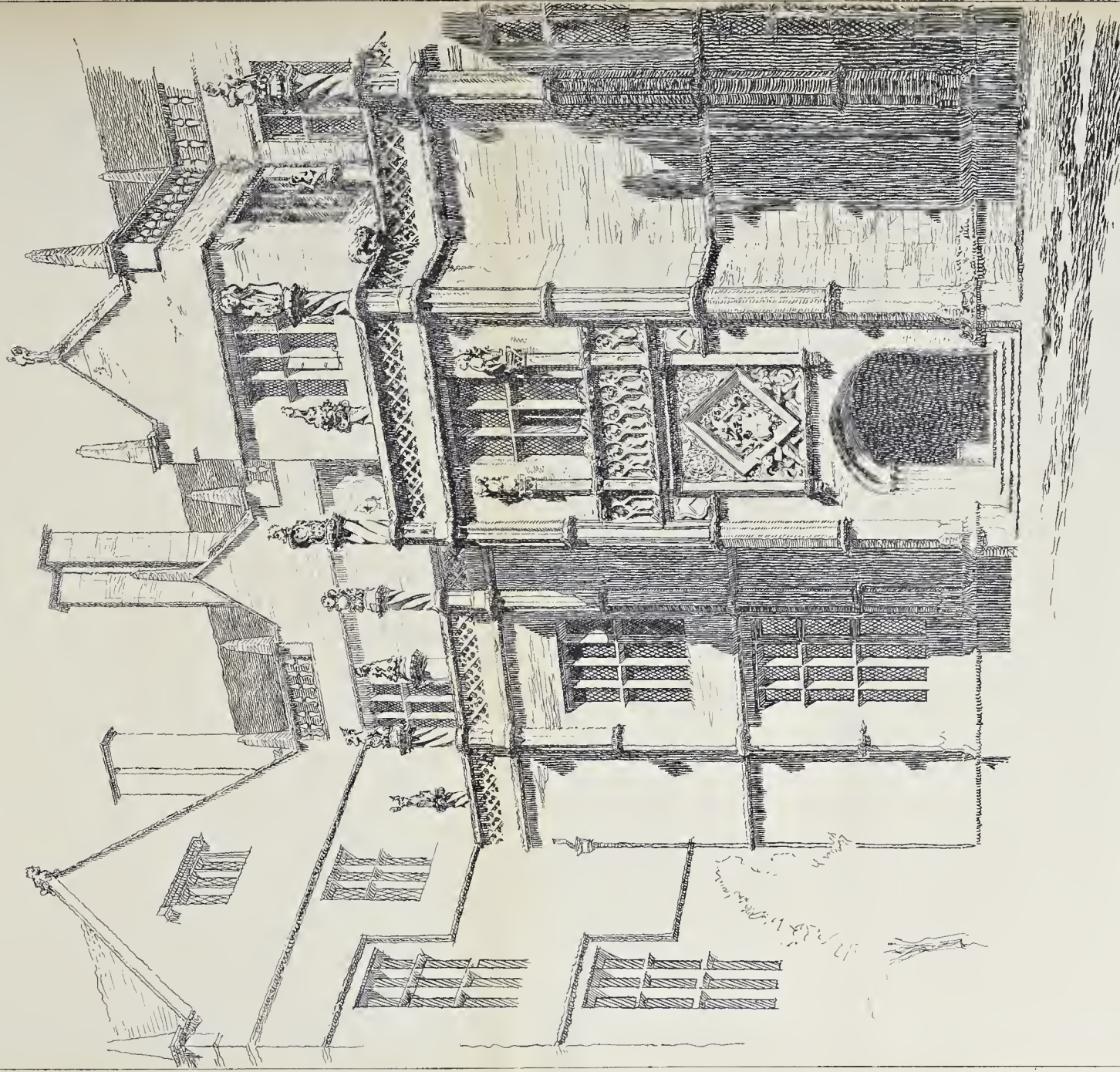
BRICK-BUILT STRONG-ROOMS.

SIR.—Perhaps you or some of your readers would kindly tell me where to put my hand on descriptive particulars of the best and most up-to-date methods of constructing an ventilating brick built strong-room—say 9 ft. by 6 ft. by 12 ft. high—for the purpose of securing valuable documents, etc., against fire. AN ARCHITECT.

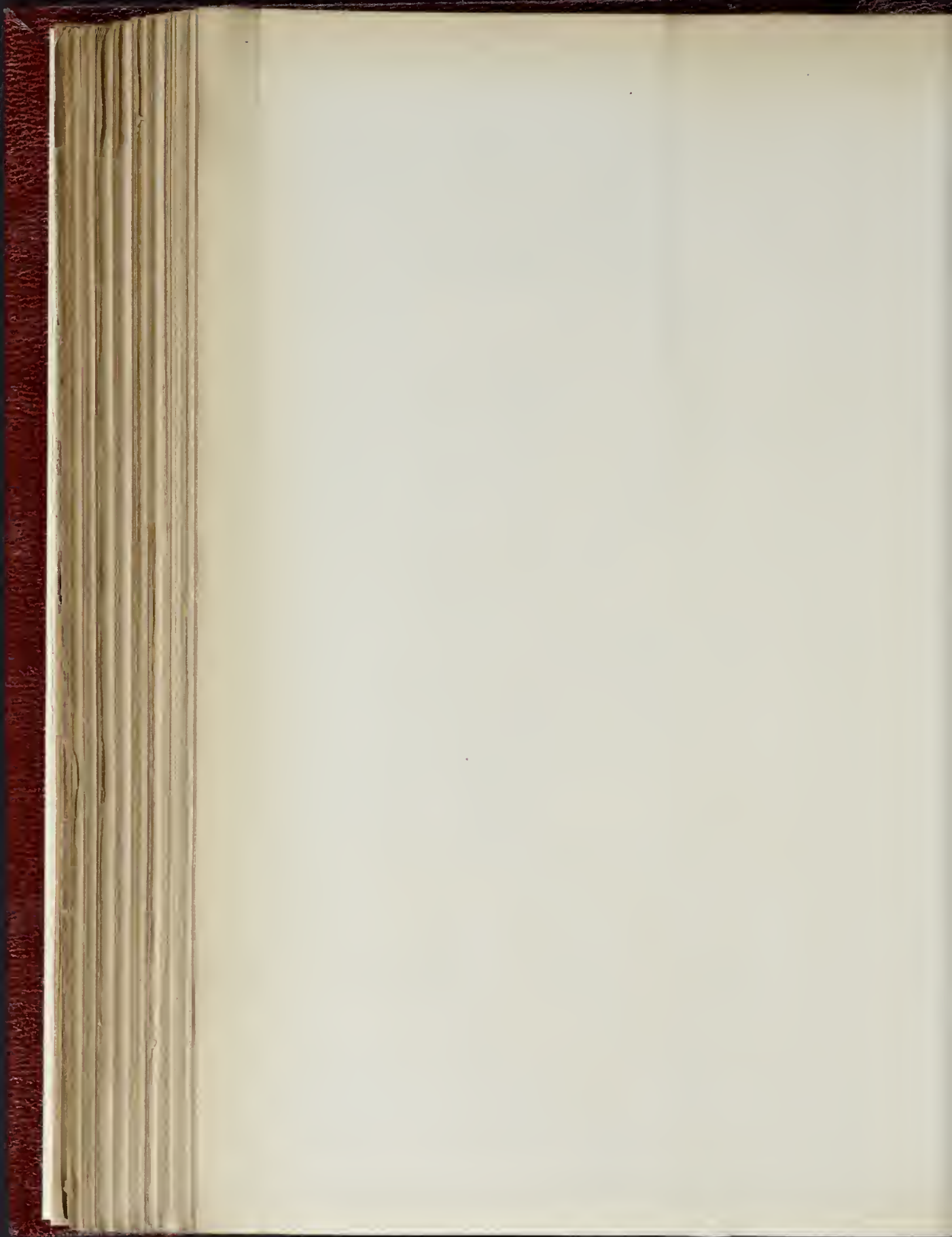


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ST GEORGES DE BOSCHERVILLE: THE CHOIR



MONTACUTE HOUSE, THE FRONT FROM CLIFTON MAWRANK

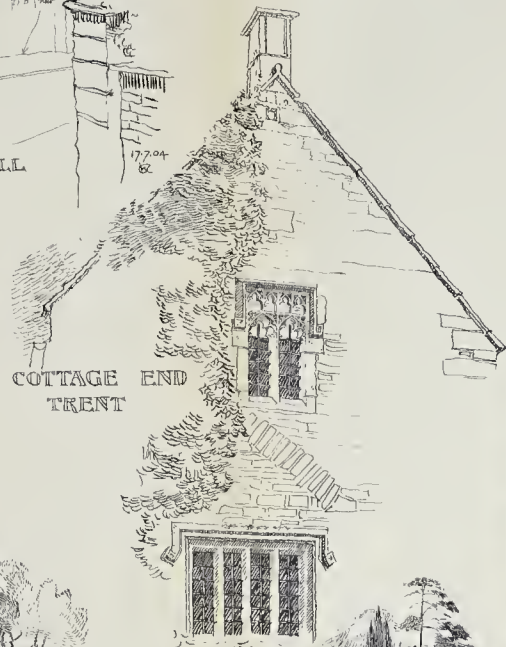




TINTINHULL



PRESTON GRANGE



COTTAGE END
TRENT



TRENT

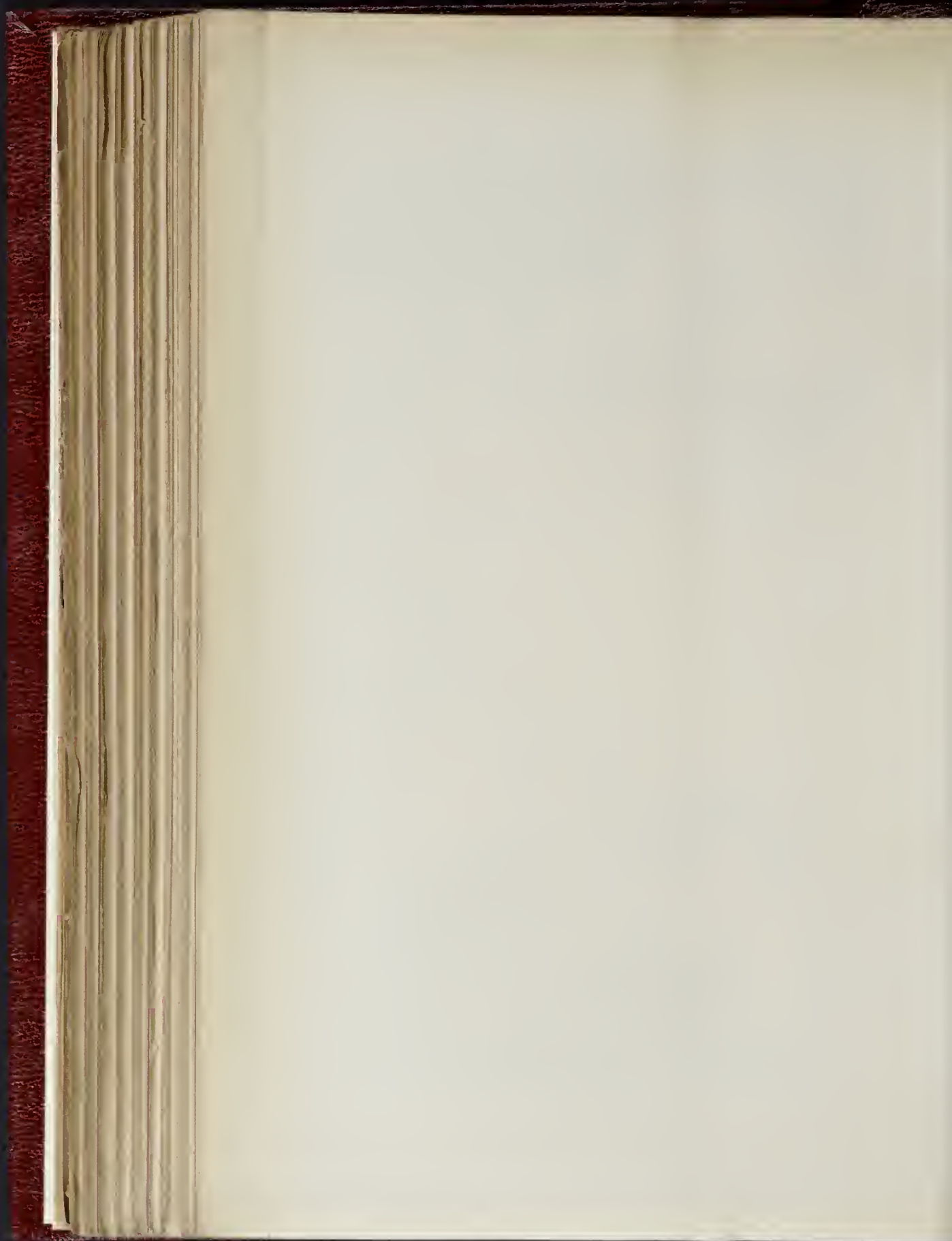


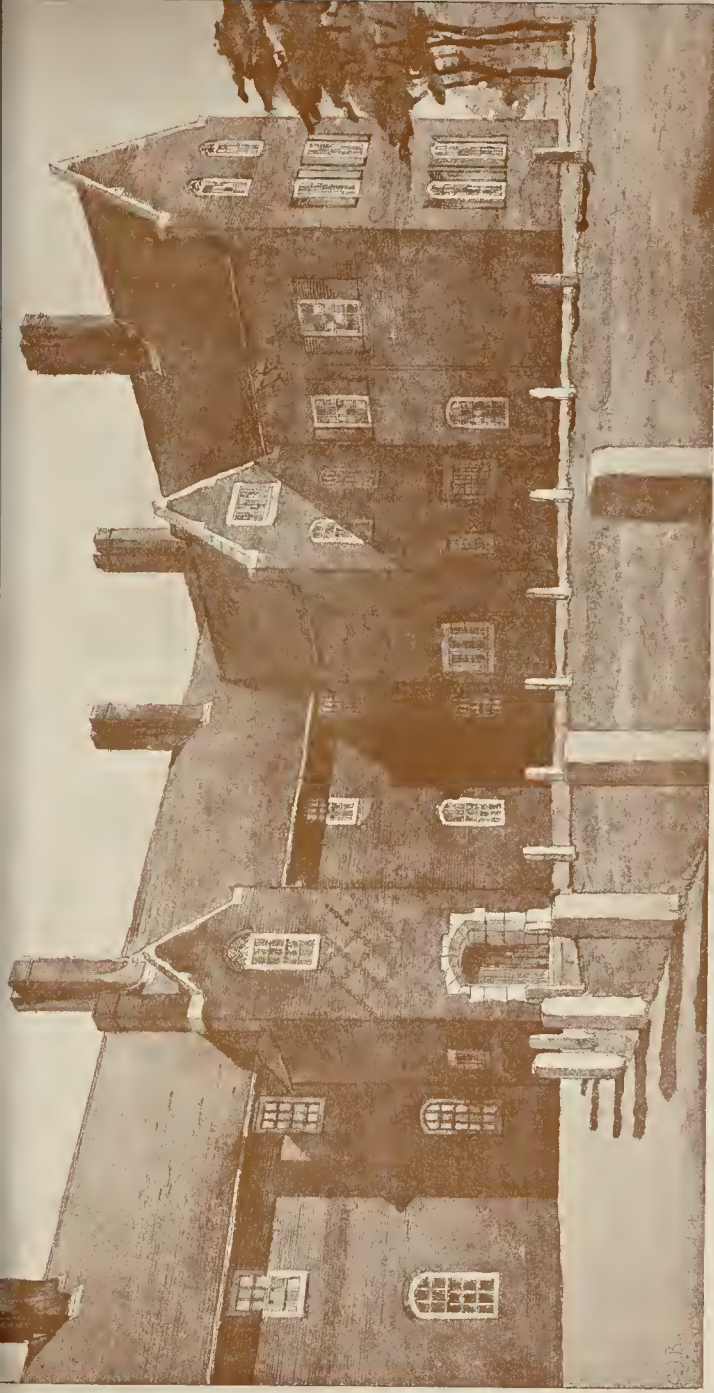
CLIFTON MAYBANK



TINTINHULL CHURCH

W. Carter
Feb. 1904

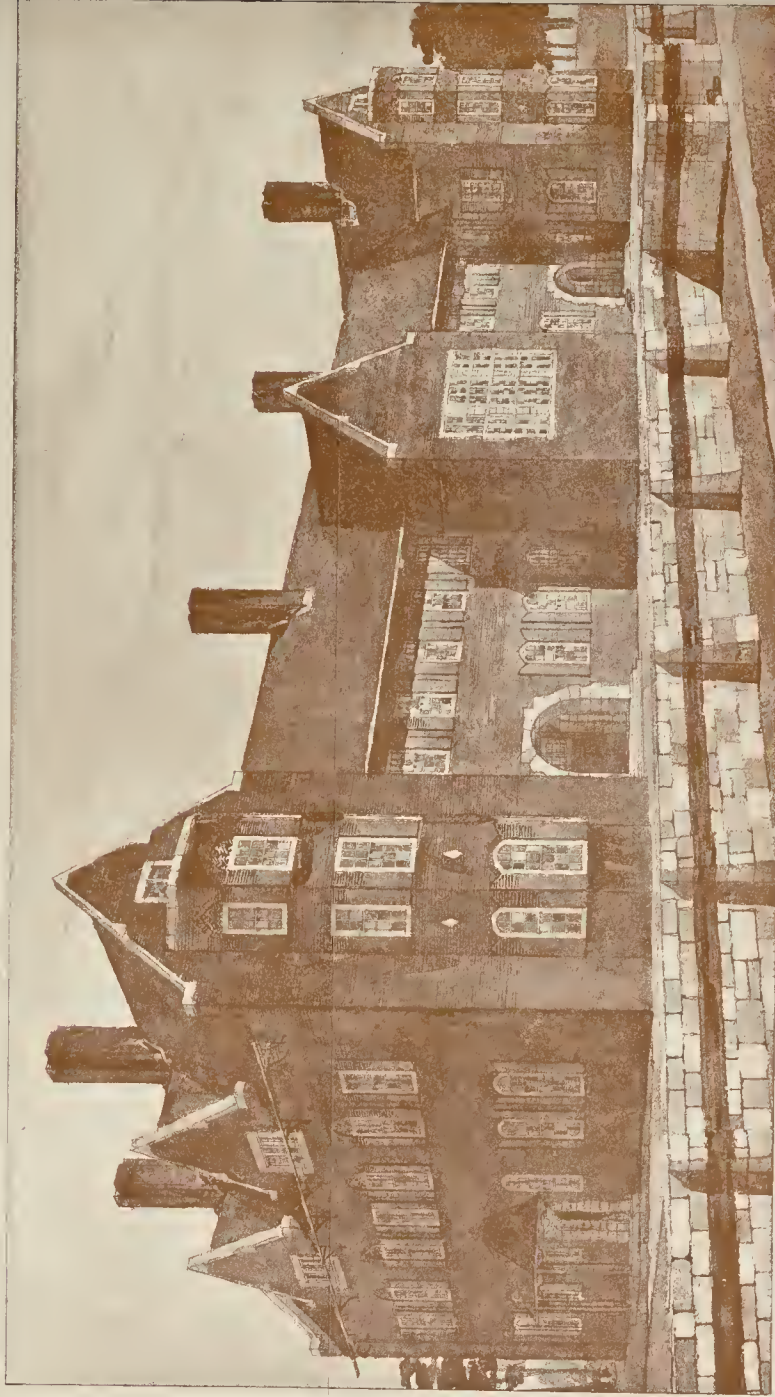




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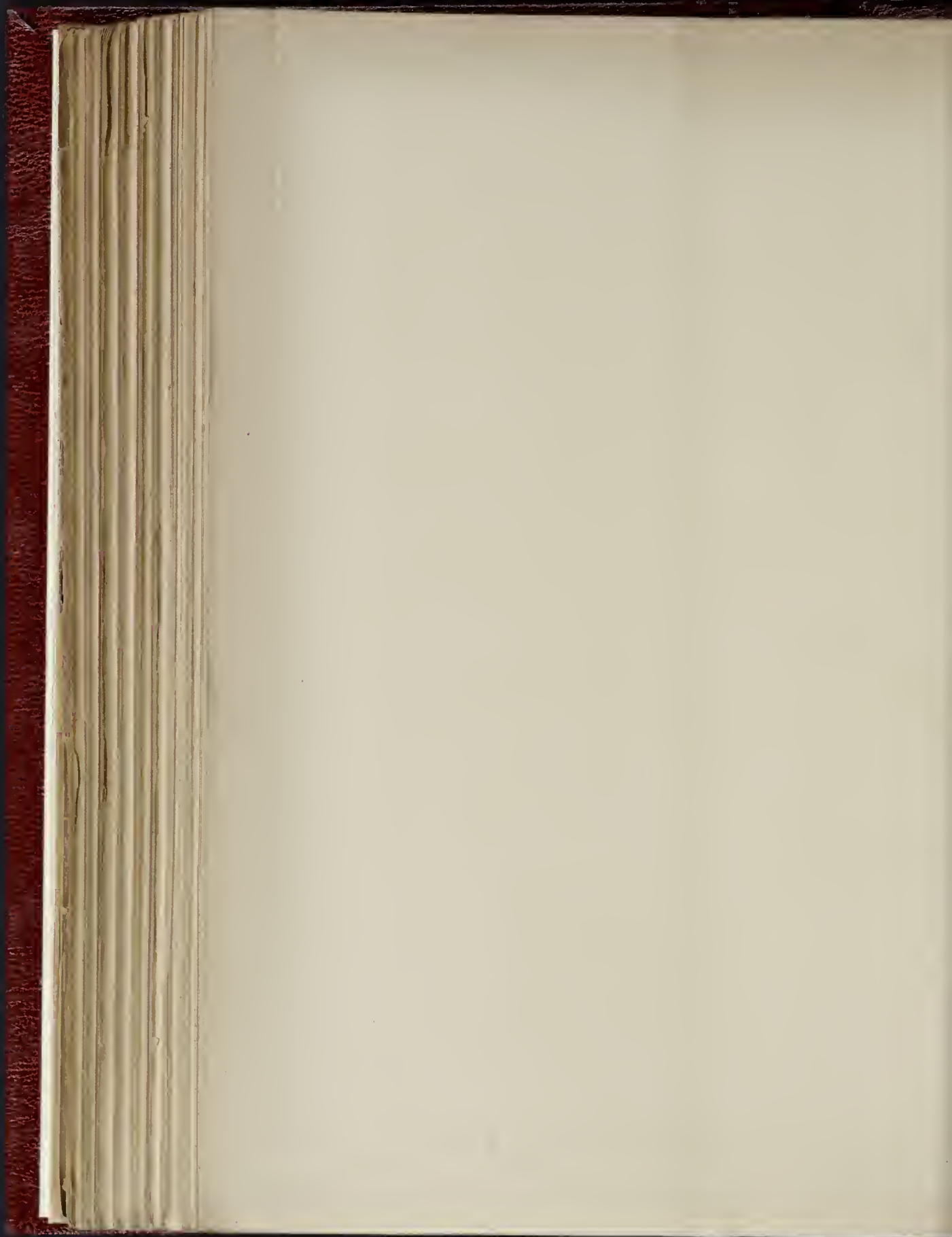
VIEW OF COUNTRY HOUSE: ENTRANCE FRONT—MR CHARLES J BATHURST, ARCHITECT

THE BUILDER, AUGUST 27, 1904.



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VIEW OF COUNTRY HOUSE: GARDEN FRONT—MR CHARLES J BATHURST, ARCHITECT



THE CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

its Society held its annual meetings at Cardigan during the week ending the 20th under the presidency of Mr. J. W. S. Bund, F.S.A. There was a large assembly of members and friends.

Cardigan Church, Priory, and Castle.

The first excursion was to the places of interest within the town of Cardigan. At an early period there was established here a house of Benedictines, a daughter house of the fish abbey of Chertsey. It was founded by Rhys ap Gruffudd, a Welsh prince of considerable ability, and a great thorn in the side of Henry II., who conferred upon him the title of "Prince of South Wales." Rhys was the founder of the Premonstratensian house of St. Mary in Carmarthenshire, and the reviver and founder of the Cistercian abbeys of Llandaf (Whitland) and Strata Florida. One of these foundations he endowed munificently, and it is clear that he not only entertained favorable opinions of the results of monkish discipline, but was desirous of obtaining the advantages that arise from free competition by giving the popular orders of his day a chance of doing their beneficent influence throughout the region subject to his hereditary rule. Rhys died in the year 1195. The priory of Cardigan was probably established by him shortly before his death. From the silence of Giraldus it may be inferred that it was not in existence in the time of Archbishop Baldwin and his suite when he visited Cardigan, and Giraldus preached a crusading sermon with his usual fervency at the bridge head. But as the priory was certainly founded by Prince Rhys, it may have been started in consequence of the bishop's visit, for Gerald, in enumerating the results that flowed from his discourse, states that it had been determined to commemorate the event by the erection of a "capella" "juxta caput pontis," and that many miracles had occurred therein. If the priory was built upon the Cardiganshire side of the river it could not have stood exactly at the head of the bridge, this site being not quite suitable for a church requiring surrounding lands; however, the position was already occupied by a castle, so that the founders had to fix a situation upon the banks of the river some little farther westward, and here, there can be little doubt, Rhys established his commemorative monument to the eloquence of Giraldus. But, whether that consisted only of a "capella," or whether the intent had been extended into the construction of a small stone house, it is certain that not a fragment exists on the site of the present church. The only ancient portion of the latter is the chancel, and this is of the early part of the thirteenth century, though some of its details are of the Late Decorated character. The chancel arch is, however, of the subsequent style, and gives the true date of the work. The east end was probably intended to be vaulted, for a century later there remained in the chancel walls a number of arches of which two only are at present visible on either side of the chancel arch. One represents the face of a man, the other of a woman supposed to be the unfortunate Margaret of Anjou, probably in error. The east window is an early example of Perpendicular rather poor design. It was once filled with stained glass, of which only a few fragments remain in the topmost lights. In the north wall is an ogee-headed and pinnacled window. A low door in the north side of the wall gave access to the leads. The central buildings were to the south of the church, extended almost to the river's brink, and were approached from the church by a walled arched doorway now closed. A barn house called The Priory standing a few feet to the south-eastward of the church is supposed to be built upon the foundations of the priory buildings, and its cellars, being rounded, were stated in a paper read upon the occasion to indicate that the priory was built before the year 1125. The house is, however, not in line of the earlier buildings, though its eastern portions were probably constructed at the time of the suppression of the priory, and out of its ruins. Traces of the priory have been met with whenever work has been done on the south side of the church, and it was stated that on the enlargement of the priory of the modern house in a westerly direction four years ago, a solid road-bed 2 ft. thick was discovered. It is probable that

excavations under the guidance of a trained ecclesiastical architect or antiquary would reveal the position and character of the chapter house and different domestic offices, and it is interesting to learn that the site of the cloister garth is still known to old Welsh residents as "y rhen ardd," the old garth. In the heyday of its fortunes the priory possessed a potent relic which brought much gain to the house, namely, a waxen taper, called Our Lady's taper, that never decreased in size or became extinct. An interesting document relating to this relic is printed in Wright's well-known "Suppression Letters," which states "that the image now situate in the church of Cardigan, which was used for a greater pilgrimage to this present day, was founde standinge upon the ryver of Tyne, and her some upon her lappe, and the same taper her ynge in her hande. The said ymage was caryed from thens into Christes church of Cardigan, and the sayd ymage would not tarry there, but was founde thre or fowre tymes in the place where now ys bylde the church of our Lady, and the taper burnynge in her hande, which contynned styll burnynge the space of nyne yeres, without wastynge, untill the tyme that one forsware hymselfe thereon, and then it extincted, and never burned after. That since the ceasinge of hurynge of the sayd taper, it was enclosed and taken for a greater relyque, and so worshipped and kyssed of pygrymes, and used of men to sweare by in difficult and harde matters, wherof the advantage amounted to greate sommes of money in tymes passed, payenge yerly of the same xxii nobles for a pension unto thabbot of Chersey." The church referred to as Christ's church is probably a chantry chapel which is known to have existed in the parish, but does not appear to have been within or annexed to the priory church. It survived the priory by a few years, but fell at the opening of the reign of Edward the Sixth. The priory itself seems to have reached a low ebb just before its suppression, for when Leland visited it, it contained but two monks, and its annual revenue according to the *Valor* was only 13*l.* 4*s.* 9*d.*

Of Cardigan Castle so little exists that it is difficult to form a satisfactory opinion of either its character or its date. It stood at a sharp bend of the river Tivy, and guarded the crossing, which must always have been effected at this spot by ford or bridge. It stands on a natural eminence, and as the key to the lower reaches of the river must always have been a place of importance from the earliest times; hence we read in the Welsh chronicles of constant conflicts for its possession, and so long as its defences were easily destructible, we have little chance of meeting with remains of its earlier existence. But when the Norman had effected a sufficiently permanent occupation to permit of the construction of a stout stone castle he was enabled to make good his position, and to build his defences in a manner that has, in some measure, defied the destructive agencies of time and gunpowder. The castle, of which the few remains still exist, was built in the thirteenth century, being probably the work of William Marshall, Earl of Pembroke, the great opponent of Llewelyn ap Iorwerth, Prince of Wales, who is historically known to have occupied Cardigan in 1240. The present ruins consist of two drum towers connected by a strong curtain wall. Speed's view shows the curtain continued around the sides of an irregular triangle, with the gatehouse at the eastern or shorter side, but most of these buildings have been removed to make room for a modern dwelling. There is, however, a portion of one of the gateway towers at the back of the house, and some of the cellarage is unquestionably the original basement, beneath which again is said to be a dungeon, now closed. The castle played a small part in the civil war of Charles I., after which it was almost entirely demolished. On one occasion the celebrated divine, Dr. Jeremy Taylor, was imprisoned here, and it is thought that he alludes to his detention at Cardigan in the preface to the "Liberty of Prophesying," where he says:—"In the great storm which dashed the vessel of the Church in pieces, I was cast on the coast of Wales, and in a little boat thought to have enjoyed that rest and quietness which in England I could not hope for." Papers on the antiquities of Cardigan were read—on the church by Mr. H. M. Vaughan, on the priory by Mrs. John Pritchard, and on the castle by Mr. S. G. Adams.

Mount Church.

This was unquestionably the most interesting

of the parish churches seen during the meeting. Its situation is one of the most romantic that can be conceived, standing as it does at the foot of an isolated hill that rises to about 300 ft., and descends precipitously on its seaward side into the St. George's Channel. The nearest village lies far away, and the only habitations visible are a few scattered homesteads. At the foot of the Mount (so called *par excellence* from the singularity of its shape and position) is a tiny creek floored with exquisite sand, the very spot to strike the imagination of a British hermit; yet the name of an early Christian is associated with the parish. The church is dedicated to the Holy Cross, an invocation that is proof, first, of the near presence of a wayside cross of unusual local reverence; and secondly, of the complete loss of the name of the early Cymric saint with which it must have been associated in the earliest days of its history. The building consists only of nave and chancel without structural division. The windows are modern insertions, but a fragment which can be detected on the external eastern face shows that the eastern gable was once occupied by a two-light Late Decorated window. There was also a single-light window at the eastern end of the south wall: this is now closed. The western gable is crowned by a rude bell cote. The roof, though it has been partially renewed, is still an interesting specimen of late XVth century timbering in an unusually good state of preservation considering the remoteness of the locality, the humidity of the atmosphere, and the severity of the western gales. The font is of very early date, having for its base what looks like part of the stem of a churchyard cross. The bowl is almost square, and large enough to admit of the immersion of an infant. The paten is pewter and of unusual shape. This parish was within modern memory the scene of a popular gathering on the first Sunday of the year. The inhabitants of the surrounding parishes were in the habit of meeting on that day to indulge in all manner of rough outdoor sports, held, it is alleged, in commemoration of a victory gained by the Welsh over the Flemings on this spot. In confirmation of the story a mound about 100 yards from the church is pointed out, which has yielded a quantity of human remains. Seeing, however, that the Mount itself bears clear traces of early circumvallation, and that animal bones are found intermixed with human in what is no doubt a prehistoric burial place, it is much more probable that the Mount was a Goidelic settlement, and that the gatherings alluded to were survivals of practices that are known to have been general in Wales in Elizabethan times. The story of the Flemings is probably due to a lively imagination working upon false etymologies, there being a Nauty Flyman, the *Flyman* dingle, close by.

Penbryn Church.

Penbryn lies about three miles northward of The Mount, and is situated in almost as romantic and beautiful a spot. It has been restored. It consists as usual of nave and chancel only, which in this instance are not in line. The chancel arch is acutely pointed, and broken only by a shallow chamfered slab, which looks as though it was not occupying its first position. On the south side of the chancel is a sepulchral niche having a pointed arch. The interesting pewter alms-dish provoked some comment; the maker's name appeared to be Mowe, and its date 1697, the last figure being indistinct. A paper on the church was read by Mr. Pryse Williams.

Prehistoric.

On the rising ground above Penbryn church stands the Dyffryn Bern stone, the inscription upon which reads: "Corbalengi Iudit Ordous," the last word being regarded as connected with the tribal name of the Ordovices. Of Castell Nadolig, a camp of Romano-British character, where a Late-Celtic bronze spoon, now in the Ashmolean Museum was found, but little could be made in the time, though the fact that in this parish has also been discovered a coin (figured in Gough's Camden) of the regular British type based on the gold stater of Philip of Macedon, would seem to make a thorough examination of the ground desirable. Justice was also not done to The Gaer, a fine earthwork, where a *motte* of precisely the type which is being ascribed to Norman castle builders is associated with an inner and an outer enclosure.

Presidential Address.

In the evening the members of the Association were treated to a formal reception by the Mayor

and Corporation of Cardigan at the Guildhall of the town. After the social function Mr. J. W. Willis Bund delivered his presidential address, which was mainly concerned with the ethnological and cognate problems presented by the early history of South Cardiganshire. The discourse was exceedingly able and original, and bristled with new and debatable points which are likely to give rise to much discussion when the discourse is published in its entirety. The word "Llan" is well known to enter into the composition of a large number of the names of the parishes of Wales, and has always been taken as equivalent to the word "church"; thus "Llanfair" is always Englished as "the Church of St. Mary." Mr. Bund contended that this was a late usage, the original signification being that of fort or military camp, which forts were the work of invaders from Ireland. St. David, instead of being a Brython of the noble stock of Cunedda, was said to be a Goidel, and the member of a tribe which, in 500 A.D., still practised polyandry. With a view to settling the many ethnological difficulties that Wales presented, he called upon the Cambrian Archaeological Association to undertake the preparation of lists of the prehistoric forts and tumuli of Cardiganshire.

Second Day.—Nevern Church, Crosses and Castle.

Nevern is well known to antiquaries of the great cross, known as the Cross of St. Brynach, which stands within its churchyard. It has also become known to the profane vulgar since its arrival at the lowest depth of pictorial degradation, namely, of representation upon halfpenny picture postcards. It is admirably illustrated in *Archæologia Cambrensis* for 1866. There is a puzzling inscription in minuscule letters on the front of the cross. The church has been restored. It consists of a western tower, nave and chancel, the latter being too large for the former. The lower portion of the tower is original, but the upper stages have been modernised, and an ineffective west window, consisting of four short round-headed lights, has taken the place of perhaps an early English lancet. A doorway of that period, unquestionably original, is placed on the north side. The font is modern. On the eastern side of the chancel arch are two transept chapels, one on each side of the church; and, probably in imitation of this feature, two similar chapels have been thrown out on the western side of the arch. The easternmost chapel on the south side, known as the Warren chapel, was probably erected late in the XIIIth century. It has a priest's chamber lit by a beautiful quatrefoil of this date in its eastern gable, but the chapel beneath was vaulted with rather coarse work during the Perpendicular period. A low doorway in the south-western corner of the chapel leads to the chamber above, and this stairway was the scene of one of the most interesting finds of recent years in Wales. It should be observed that in addition to the great cross of St. Brynach already mentioned the churchyard of Nevern contains a stone bearing an inscription in Latin and Ogam, the ancient Goidelic script. There is also known to have been within the church yet a third stone inscribed with the word "Johannis," but this has disappeared. In examining the steps just referred to, it was noticed by the Ven. Archdeacon of Montgomery that one of the stones above his head bore upon its exposed face a peculiar form of twisted ornament. Later, he drew the attention of Mr. Romilly Allen to this, and upon Mr. Allen going to look for the stone, he mistook the one to which he had been directed, and set about examining the uncovered face of the stone lying next to that of which he was in search. He at once perceived the presence of Ogam marks upon the exposed angle, and thus discovered a fresh inscription. The Ogam lettering reads ECUANMA, the last two characters no doubt standing for the word MAQUI, that is, "Ecnan, the son of—." It is of course impossible to say whether the marks are continued round the other angle, as is frequently the case, or whether there is not also an inscription in Roman letters on one of the other faces of the stone. It is, moreover, by no means certain that the neighbouring supporter with the peculiar incised ornament may not prove to be the lost "Johannis" stone. A good paper on the church was read by the Rev. Isaac Morgan, vicar of Eglwysrwrw. A short distance from the church is a plain, equalled cross cut into the living rock, with a natural ledge below on which devout travellers

kneel; and upon an adjacent height are the remains of a small castle, which has been so thoroughly dismantled that it is impossible to dogmatise upon its age or extent.

Newport (Pem.) Church and Castle.

This little town arose upon the building of a strong castle on the slope of the neighbouring hill by a descendant of Martin de Turibus. It became the head of the marcher lordship of Kemmes, carved out by the valour of that warrior, and the privilege of naming its mayor, which its founder reserved to himself, continues to be exercised by Sir Martine Lloyd, Bart., the present representative of its marcher lord. The ancient Welsh name of the town is Tref-draeth; the township of the strand, in allusion to the splendid sweep of open beach which spreads away on either side; but to its Norman founder it was a "new port," or burgh, in contradistinction to the vill, probably Nevern, from which he had removed the headship of his barony. The ruins of the present castle are those of a building of the first half of the XIIIth century, placed on a levelled spur of the hill, where a small stream could be utilised for the purposes of the moat. The main entrance faced the north, and a strong curtain ran along in a westerly direction to a tower at the north-west angle. Thence it was continued to the south-westernmost corner, where was another tower of which hardly any masonry remains, and still further to a tower rising from a square base at the south-eastern corner. Here the ground slopes abruptly to the little stream before mentioned. It is now impossible to say how the supply of water to the moat was controlled, or whether there was any means of communication with the opposite bank on this side of the castle. The south-eastern tower probably contained the residential apartments, which has preserved its distinctive features to a greater extent than any other part of the building, though it would be difficult, if not impossible, without some excavation to determine their different uses. A basement chamber the groined roof of which is supported by a central pillar of Late Decorated character, is popularly spoken of as the dungeon, but is more likely to have been the cellar. The gateway has been incorporated into a modern house, which has been built against it to face the courtyard, now a charming grassy lawn, and this part of the castle was accordingly not inspected.

The church has been thoroughly and effectually restored, so that the only feature of ancient date still remaining is the fine western tower. The buttresses are good examples of the regular Perpendicular type, dying off into the tower face just beneath a very striking corbel table which carries a deep and imposing battlement. In the south-western buttress immediately below the second weathering is an unoccupied niche, and at the same distance below the third slope is a female head. There is a good deal of heraldry about the tower which no member of the party could interpret. About half-way up the western face are two shields each bearing a chevron and perhaps some other charge, while the label around the western door is terminated with shields showing a chevron, and the outer members of the door mouldings are also finished off at the ground level in the same manner. The lowest stage of the tower has a slight batter. The tower stairs are carried up in a square projection on the north side, and are lighted by slits and, at the second opening, by a quatrefoil. Internally there is little of interest beyond the font, which is a good example of the massive Norman fonts that seem to have been general throughout the district. The chalice is dated 1574, and is of good pattern. The tower opens into the nave with an acutely pointed arch, as in the case of Nevern, and in the space under the tower is a fine sepulchral slab of the early part of the XIVth century. On its upper part is the head of a young female wearing a wimple brought tightly beneath the chin, and a plain band across the forehead. Below is a floriated cross of great beauty and finish. The inscription running round two sides of the slab is as follows:—" + Cos: ane; git: icl: dev: del: alme: eit: mercie." The first two words, of the reading of which there can be no question, have always been a puzzle to antiquaries, and all kinds of manifestly inadequate suggestions have been offered of their meaning. The writer of the present notice begs to offer another, which does not at any rate violate probability. It is that they stand for the modern "Ceans aine": "Within

here lies the eldest: God have mercy upon his soul." The person commemorated was probably the senior of several sisters, and the heraldic emblems upon the exterior of the tower were doubtless considered sufficient to point to his family and lineage without the necessity of more personal designation. The Rev. Isaac Morgan read a paper upon the church.

Prehistoric.

The next visit was to the Pentre Evan cromlech, the largest example of this form of sepulchral monument in the kingdom. Sir Henry Howarth made some interesting remarks upon the subject of early burials. This is the only ancient object in Wales that has been scheduled by the Board of Works under the Ancient Monuments Act. As an instance of the silent but unceasing work of nature, it may be observed that a member of the Association who was present stated that she had visited the cromlech over half a century ago and though mounted on a horse fifteen hands high she was then not able to touch the ca stone with her hunting crop, whereas now she could do so on foot with a walking-stick; the neighbouring farmhouse of Pentre Evan is a building, now a barn and stable, which contains some rudely splayed windows and an early, probably original, roof. It is apparently of the time of Henry VII.

After luncheon an arduous climb was undertaken to the summit of Carn Ingli, a height of about 1,250 ft., on the upper slopes of which is an enormous camp of the same character as Tre'r Ceiri, in Carnarvonshire. The latter has been the scene of excavations by the Rev. J. Baring-Gould and Mr. R. Barnard, the former of whom read a paper at the Portmadoc meeting of the Association. The conclusion of the excavators, namely, that Tre'r Ceiri was probably constructed in the first century of the Christian era, was stoutly contested upon that occasion, so that the visit to North Pembrokeshire was looked forward to with interest, as several of the principal heights of the Preeley range are crowned with stone camps of similar construction to, and almost as large in area as, the Carnarvonshire example. Carn Ingli is a splendid example of its class, and astonished the visitors by its extent, its strength, and the complexity of its arrangements. The upper slopes of the hill are strewn with enormous masses of stone and of ruined buildings. The cursory examination which the party could give to this splendid prehistoric fortress cannot be said to have advanced the stock of knowledge relating to its age and builders, but its extreme rudeness renders the belief difficult that it was erected during the period of the Roman occupation, or that the great people would have permitted its construction. Of recorded history it has none. The party next drove to Lwyngwair, where Mr. J. B. Bowen entertained them to tea.

Thursday.—St. Dogmael's Abbey.

The little village of St. Dogmael's (Walling Llandudoch) lies on the Pembrokeshire side of the Tivy, about five miles from the embouchure of the river. It thus fell within the lordship of Kemmes which the strong arm of Martin de Tours won from the Welsh in the first half of the XIIIth century. Following the prevailing custom of the early Norman leaders, he established a religious house at St. Dogmael's, or, as it may be, enlarged and enriched an existing British foundation. His new monastic settlement he annexed to the Benedictine abbey of Tiron, in France, and he and his son endowed it liberally with lands. The earliest charters of the house have been published by Mr. Round. The buildings, now above ground, though mere fragments, are clearly of different dates. A roofless edifice, the first of which the visitor arrives, has been termed a refectory by Fenton, the historian of Pembrokeshire, but careful scrutiny will show it to be of much earlier date than the other portions of the ruin. It is without doubt part of the original Norman church, though it has lost almost all clues to its identification. Its most interesting feature is the remains of its stone roof, which was carried upwards in a graceful curve. This building runs east and west, and measures about 40 ft. by 20 ft. The height to the apex of the roof is about 30 ft. It is now a few feet, and has been considerably knocked about in its long and scarier of degradation down the ages. An orifice in the south wall, now closed, appears to have originally been of the early Pointed style as is also the west door. A small niche on the

side probably marks the position of the chancel, and it is not perhaps entirely fancy that signs of the drain in a partly broken stone building is huddled, but these have been so red, or are so hidden by ivy, that it is impossible to make out their original character. The stonework externally is extremely good, an excellent effect being obtained by courses of large stones of a different colour to the ordinary rubble. No trace of any conventional buildings of the same period as this church is visible, nor is there any indication in the ground around of a direction in which they would have to be sought. About two centuries later than the construction of this edifice the convent must have had itself in flourishing circumstances, for a totally fresh establishment was built a few rods north-westward of the first church. The plan of the new foundation can be made out in fair success, for the ruins consist of the east front, and north wall and transept of the priory church. Fifty years ago there would not have been clear indications of the eastern end, but the full extent of the church in this direction is now only a matter of conjecture. The west window, which was of great value, has lost every vestige of tracery. The north transept was altered at a later period, and probably transformed into a mortuary chapel; the lower portion of a beautiful fan-tracery of still springs from a fine corbel. This transept is somewhat too shallow in proportion to the length of the nave. It contains two recesses for tombs. Of the conventual buildings none have survived, save a fragment of walling at the south-east corner of the cloister common to the original church. The latter was probably retained as the parochial church, but does not appear ever to have been structurally connected with the later edifice. It is much to be desired that researches into the documentary history of St. Dogmael's priory should be undertaken, and in particular that the first account of the priory's revenues compiled after its dissolution should be transcribed, as it would probably throw much light upon points that are at present not susceptible of explanation. The president of the Association drew attention to the far too luxuriant growth of ivy over the eastern end of the later church, and suggested that it should be judiciously pruned. Within the priory grounds stands an ancient stone containing inscriptions in Latin and Ogam commemorative of one Sagramnus, the son of Cuno-mus. Other slabs bearing crosses of early date are scattered around, and the altar stone stands upright, half buried in the ground. The remains of what must have been a splendid sepulchral tomb have been formed into a sort of gateway in front of the adjoining house.

New Castle Enllyn.

A small military work most probably occupied on very early times the tiny peninsula situated at this spot by an extremely sharp bend of the Teify, where are now the remains of a military gateway of the period of Henry VII. Every other part of the castle has been reduced to shapeless grass-hidden masses, though the conformation of the ground itself admits of its reconstruction. The peninsula is roughly triangular in shape, having the river protecting the two longer sides. The eastern or landward side was defended by a deep out, fed from both arms of the river and by transforming the peninsula into an island. There were probably outer defences where the ground fell away to the level, but these have left not a wrack behind. The masonry of the gateway towers is poor and late, and it is without doubt the work of Sir Rhys ap Thomas, the knight to whom the success of Bosworth Field was largely due. The castle was the seat of the unfortunate Sir Rhys ap Iffludd, the grandson of Sir Rhys ap Thomas, and certain disturbances that occurred here in the early part of Henry VIII.'s reign led to the young knight to the scaffold. A somewhat inadequate paper on its history was read within the courtyard of the castle by Mr. C. Roberts, but its architectural features were not alluded to, nor any effort made to recall its recent renown. Sir Henry Howarth, however, after a few general remarks upon military architecture, initiated a very interesting discussion on the question of the date and constructors of the moated mounds which are found all over the country, and which were attributed to the Anglo-Saxons by the late Mr. G. T. Clark. This view has recently been attacked with much ability and learning by Mrs. Armitage in the *English Historical Review* and other

journals, and by Mr. J. H. Round, the contention being that all such mounds are Norman in construction, and consequently of later date than 1066. Mr. Edward Owen being called upon for a few remarks, observed that while unable to speak of the applicability of Mrs. Armitage's conclusions to English mottes, he found considerable difficulty in accepting them as true of the moated mounds of Wales. Even if the English examples were ultimately proved to be pre-Norman in date, it was quite clear that they must be placed towards the end of the period; and, regard being had to the influence of Norman manners upon the court of Edward the Confessor, and to the imperative necessity that faced the Norman barons directly after Hastings of securing their possessions as rapidly as possible, it was not merely likely, but highly probable, that the undoubted advantages of a residence upon a motte, whether crowned by wooden or by stone defences, would out of the sheer necessity of the situation lead to their construction. He was therefore unable to meet Mrs. Armitage's argument so far as it was based upon the mottes of England. But difficulties at once arose when the theory was applied to Wales. Scattered up and down the Principality are artificial mounds surrounded with deep moats, in some instances filled with water at the present day. Some of these, such as the splendid example which has given its name to Moat Lane, have never borne a stone tower, though they were doubtless defended by stout wooden barricading. Others like Brynllys, on the English border, have a more or less perfect stone keep. The point was that many of these mounds are found in places where it can be historically demonstrated a Norman baron had never penetrated to. It was possible that at Rhuddlan and at Cardiff the mound and tower were both Norman, because it could not be denied that the Normans had reached those places before the close of the XIth century, and that the exigencies of their dangerous situation would call upon them to adapt existing defensive works, or to construct new ones. But this could not be said of the precisely similar moated mound at Dolhenmaen, in Carnarvonshire, visited by the Association last year, or of many other instances that could be adduced on ground that the Norman, *qua* Norman, had never trod. Until it could be shown, either that the Normans had been able to occupy for a sufficiently long period to construct the enormous moated mounds the sites of these erections in various parts of Welsh Wales, or that the Welsh had copied a form of defensive post which, it is admitted, was soon superseded by more elaborate stone structures, he was unable to regard Mrs. Armitage's views as affording the true explanation of the Welsh mottes; and if they did not apply to Wales there would seem to be grounds for doubting them altogether. Lieut. Colonel W. L. Morgan, of Swansea, took the opposite view, arguing that there were differences between the mottes of England and the moated mounds to which Mr. Owen had referred; but he did not enter into details of the dissimilarities upon which he insisted.

Cenarth Church.

This church, which is situated in the county of Carmarthen, is practically new, and, judged as such, is a charming example of a modest country church. The only relic of a bygone age is the font. In size it differs from the square and massive Norman fonts, of which many are still in use in the district, and for this reason several of the visitors were inclined to consider it to have originally been a free standing font or stoup. It is ornamented with five heads, arranged at four equal distanced spaces, there being accordingly two heads in one space. The spaces are connected by a cord, which droops into a curve between each facet. The churchyard contains a famous Ogam stone, which at one time stood over the grave of the favourite charger of a neighbouring squire, and at a still earlier period seems to have occupied a site called Temple Druid in a far away Pembrokeshire parish. How it found its way across the Precelly hills, to find an honoured home within the confines of Carmarthenshire, has provoked the curiosity of Professor Rhys, but found no explanation from the assembled antiquaries. After tea upon the lawn, the valuable collection of coins, manuscripts, and early printed books, for which Cenarth Vicarage is celebrated throughout Wales, was examined. Just below the church the Tivy flows noisily over rocks that attempt to bar its course, and is spanned by an interesting bridge. A few cottages are grouped around the bridge end, one of which, by reason

of its possession of a good oaken roof with trefoiled openings between the timbers, may possibly have been a tiny chapel and dwelling of the guardian of the bridge.

Cilgerran Castle and Church.

The strategical value of the river Tivy to the Norman invaders of the district is shown by the line of castles constructed by them at favourable spots along its banks, of which those of Cardigan and Newcastle Emlyn had already been visited by the antiquaries. The most important, however, both from size and position, was that of Cilgerran, which, unfortunately, came in for inspection at the close of a long day. It stands on a tall cliff overlooking the river, at this point at its finest, and it gave to Turner one of his most glorious inspirations. Like the other castles which have been named, the plan of Cilgerran is adapted to the irregularities of the site, and balance of parts or symmetry of design is, therefore, not to be looked for. But the admirable manner in which the position has been utilised makes this an interesting example of a pre-Edwardian castle, and its details call for thorough and careful study. One feature in which the baronial castles of the Principality differ from the great achievements of the first Edward is the much more restricted area or their outer defences. All the great Edwardian fortresses of North Wales were carefully planned with the view of defending the towns over which they threw a protecting eye, and the manner in which the town defences were arranged as an integral part of the general plan of the different castles is, in each case, of great interest, not alone to the student of military architecture, but to him who regards only the care with which these nascent municipalities were fostered and protected. Cilgerran castle was not planned to guard a tiny town. What was outside its moat was of little concern to the fierce noble whose chief purpose was to provide himself with the best defence he could construct against his enemies, and who allowed such of his followers as lived without its walls to fare as best they could in the day of trouble. There is an excellent description of the castle by Mr. Clark in the 1859 volume of "Archæologia Cambrensis," which has not been reproduced in his well-known book, and it must suffice on this occasion to draw attention to that account, as enough time was not given for the mastery of the peculiarities that the irregular plan of the building occasioned.

Cilgerran church is yet another instance of the drastic restorations to which most of the edifices of the district have been subjected within the past half century. It consists of a nave with south aisle, chancel and western tower. The latter, which is for the most part original, is of the regular South Cardiganshire and North Pembrokeshire type. This church, however, possesses a western door of good, though plain, Early English character. The churchyard contains a Latin and Ogam inscribed stone.

Friday-Bridell Church.

There was nothing in this practically modern and uninteresting edifice to delay the party; but an Ogam stone, of which every churchyard in this neighbourhood seems to possess a specimen, was examined and dilated upon.

Moel Trigarn, &c.

This was the *pièce de résistance* of the day's programme. It is a large stone camp of the character of Carn Ingli, seen on the preceding Wednesday, stationed on an eminence of the Precelly Hills. The summit of the hill, which is 1,200 ft. above sea level, is crowned by three stone cairns, which has given the height its distinctive appellation. The mountain is clothed to its crown with coarse grass, and it is thus relieved of the stern and barren aspect of its neighbour, Carn Ingli, and of its congener, the Carnarvonshire Tre'y Ceiri. In design it does not differ from those camps, but some of its details are peculiar to itself. A discussion arose on its probable age; but notwithstanding that both Mr. Edward Laws and Colonel W. L. Morgan agreed that it was of the Late Celtic period, they differed much on the question whether it fell early or late in that period. Many of the hut circles have been excavated by Mr. Baring Gould, and a full account of the objects then unearthed, accompanied by good illustrations of the camp, is given in "Archæologia Cambrensis" for July, 1900.

The party next drove to Clydai church, where are no less than three inscribed stones. At Capel Colman the programme was exhausted

by an examination of Maen Colman, a monolith bearing a rude cross within a circle, and on the reverse side another cross of different form.

At the evening meeting on Thursday an interesting and valuable address was given by Mr. W. Riley, of Bridgend, on the results of excavations undertaken by him into prehistoric mounds scattered over the low-lying land around the mouth of the river Ognore in Glamorganshire. The human and other remains, mainly of the Early Neolithic period, which had been disinterred by Mr. Riley, were brought by him for exhibition to the antiquaries at Cardigan, and Mr. Riley's discourse was followed by a very able demonstration by Professor Hepburn, of the Cardiff University College, of the cranial and anatomical peculiarities of Neolithic man, as evidenced by the skeleton then produced. This example showed a man of brachycephalic skull, having great brain capacity and physical power. In the tumuli which he had opened Mr. Riley found quantities of the objects usually associated with Neolithic dwellings, together with one or two fresh forms that were unknown to so experienced a prehistoric archaeologist as Mr. Elward Laws, F.S.A., of Tenby. In several instances the mounds contained secondary interments, apparently of the later Neolithic period, and the neighbourhood also yields relics of the Bronze and Early Iron ages.

Another paper by Professor Anwyl of the Aberystwyth University College, dealt with the "Early Settlers of Cardiganshire." It was an able and careful *résumé* of the sum of modern knowledge upon the question, but it contained none of the suggestive, if risky, conclusions of Mr. Willis Bund's presidential address.

On Friday evening the usual complimentary votes were passed, the most deserved being to the honorary local secretary, the Rev. D. H. Davies, Vicar of Verwiz, who had been indefatigable throughout the meeting in attending to the comfort of the visitors. Shrewsbury was selected as the rendezvous for 1905.

BOOKS RECEIVED.

EUROPEAN AND JAPANESE GARDENS. Papers read before the American Institute of Architects by A. D. F. Hamlin (Italian Gardens); R. Clifton Sturgis (English Gardens); J. G. Howard (French Gardens); and K. Honda (Japanese Gardens). Edited by Glenn Brown. (Philadelphia: H. T. Coates and Co. 1902.)

BRITISH STANDARD SPECIFICATION FOR TRAMWAY POLES. Issued by the Engineering Standards Committee. (London: Crosby Lockwood and Sons. 5s. net.)

BRITISH STANDARD TABLES OF COPPER CONDUCTORS AND THICKNESSES OF DIELECTRIC. Issued by the Engineering Standards Committee. (London: Crosby Lockwood and Sons. 2s. 6d. net.)

THE TIMBERS OF COMMERCE AND THEIR IDENTIFICATION. Illustrated. By Herbert Stone, F.L.S., F.R.C.I. (London: W. Rider and Son, Ltd., Aldersgate street, E.C.)

MINHEAD, PORLOCK, AND DUNSTER. Second Edition. The Homeland Handbooks Series. (Minhead: Cox, Sons, and Co., Ltd.; London: The Homelands Association, Ltd. 6d. net.)

HANDBOOK OF STATIONS, including Junctions, Sidings, Collieries, Works, etc., on the Railways in the United Kingdom. (London: The Railway Clearing House, Seymour-street, Euston-square, N.W. Price 8s.)

FERRIO AND HELIOGRAPHIC PROCESSES; a Handbook for Photographers, Draughtsmen, and Sun-Printers. Second Edition. (Published for the Photogram, Ltd., by Dawbarn and Ward, Ltd. 2s. net.)

THE CONSTITUTION OF PORTLAND CEMENT FROM A PHYSICO-CHEMICAL STANDPOINT. By Clifford Richardson. (New York: Research Division, Testing Laboratory, Long Island City, N.Y.)

APPOINTMENT.—A meeting of the Samford Rural District Council was held at the Board Room, Tattingstone, recently, when the Clerk, Mr. Arnold J. Haward, read the report of the committee appointed to consider the subject of the appointment of a building surveyor. The committee reported to the effect that Mr. Henry J. Wright, the Sanitary Inspector to the Council, should be appointed to the office. After discussion this was agreed to.

The Student's Column.

NOTES ON PORTLAND CEMENT.

CHAPTER VI.—FINENESS.

PROBABLY one of the first tests to which cement is subjected is that for fineness of grinding. The manufacturer in passing through his mill, or the user on receiving a fresh consignment, will, almost unconsciously, pick up a pinch and rub it between his fingers to test its fineness.

The demand for finer ground cement is on the increase, a few years ago 10 per cent. residue on a sieve of 2,500 meshes per sq. in. being the general rule; now 5 per cent. on a sieve of 10,000 meshes is not uncommon.

Still, the value of fine grinding does not appear to be appreciated by users generally. Cases have been known where builders have pronounced a cement over-ground.

Nothing could be more absurd. A cement cannot be too finely ground, as the larger the percentage of flour, the greater its capacity for carrying mortar; that is, concrete as strong may be made with half the quantity of a finely-ground cement that would be necessary of a coarsely-ground one. This fact is not appreciated by all builders, the same quantity of cement being used in mortar regardless of the fineness.

A cement having a residue of, say, 10 per cent. on a 50 sieve will show an increase of 20 per cent. in tensile strength if ground fine enough to all pass through this sieve; but it is in sand tests that the increase in value due to fine grinding is seen. As each particle of sand requires to be covered with a thin coating of cement, the more finely ground the latter is, the thicker the cementitious coating and, therefore, the stronger the mortar will be bound together.

It is generally believed that the coarse particles in cement have no cementitious value, but this is not the case. The author has made small blocks of the particles held by a 76 sieve, which after being in water used for storing briquettes some months have attained considerable hardness. This was thought to be probably due to the deposition of hydrate of lime from the briquettes in the pores of the blocks; but experiments carried out by Mr. D. B. Butler conclusively prove that the coarse particles have in themselves some cementitious value.

Mr. Butler separated the coarse particles into three degrees of coarseness, and to make certain that no fine cement dust was held by the particles, they were washed thoroughly by decantation till the washing water was clear. The coarse particles thus prepared were made into briquettes, which were broken after being six and twelve months in water. The results are shown in Table I.

lower tensile strains than the original samples did.

Mr. Butler's experiments prove—

(1) That the coarse particles of cement are not inert, but have a certain value according to their size.

(2) That fine grinding of cement reduces its cohesive power, but greatly increases its adhesive power.

An instance of the cementitious value of the coarse particles in cement was brought forward by Mr. G. L. Anderson in the course of a discussion on a paper read before the Society of Engineers.

Mr. Anderson experimented with briquettes about a year old, made of cement which had been originally ground to a fineness of about 5 per cent. on a 50 sieve. He ground them up without recalcination or other treatment, so as to all pass a 76 sieve and leave a residue of 16 per cent. on a 180 sieve, and made briquettes of the resulting powder. The neat briquettes stood a tensile strain of 403 lb. per sq. in. after seven days, 415 lb. after twenty-eight days, and 435 lb. after three months. The sand tests gave strains of 224 lb. after twenty-eight days, and 300 lb. after three months.

Fine grinding greatly quickens the setting time of a cement. According to Le Chatelier's theory, the setting is due to super-saturation, so that, the more finely a cement is ground, the more readily it dissolves and the quicker the deposition of the crystals. The fineness of grinding should always be taken into account when judging the setting properties of a cement. The demand at the present time is for a fine cement, and at the same time a slow-setting one. These two characteristics are antagonistic, a finely-ground cement meaning a quick setting one, according to the degree of fineness, unless artificially rendered slow setting. This may be done by suitable aeration, and engineers and contractors should make allowance for this. The author has seen specifications in which it is stated that the cement shall be ground very fine, the setting time not to be less than three hours and the volatile matter not more than 1 per cent. This is almost an impossibility unless at great expense or artificial means of slowing the setting is resorted to.

Fine grinding of a cement undoubtedly checks to a considerable extent the tendency to "blow." Unsoundness of a cement is caused by one of three faults in manufacture—viz., the coarse grinding of the raw material; over-lining or excess of lime; under-burning. In each case free or loosely-combined lime is the result. The first two are the most dangerous, as the free lime is enclosed in the hard-burned particles, and it may be months before their effect may be felt. Unsoundness from under-burning is easily overcome by aeration. The benefit of the fine grinding of the cement, therefore, is that the uncombined lime which would other-

TABLE I.

Size of Particles.	Held by a 50 x 50 Sieve.		Passed 50 x 50. Held by 70 x 70.		Passed 70 x 70. Held by 120 x 120.	
	6 Months.	12 Months.	6 Months.	12 Months.	6 Months.	12 Months.
Sample A	150	160	200	200	250	330
" B	95	120	110	180	175	290
" C	90	120	110	170	190	280
" D	90	140	115	137	192	200
" E		180	190	292	330	420

Having proved that the coarse particles had some cementitious value, various samples were procured to try the effect of fine grinding and the presence of the coarser particles had on the strength of the cement. Tensile tests were made of each sample—first, in original state; second, ground very fine; third, coarse particles substituted by sand of similar size.

The effect of the fine grinding was greatly to increase the cementitious value, as seen by the sand tests. The neat tests in some cases gave higher results for tensile strain after seven days, but not increasing much thereafter, and in others the tensile strain after seven days was not so good as that of the original samples. An explanation of this might be found in the fact that the fine grinding made the samples so quick-setting that time could not be allowed to make the briquettes properly, and a large excess of water was required in gauging. In each case the substitution of sand for the coarse particles gave

rise to the coarse particles is easily overcome by aeration or is hydrated on gauging the cement with water, and is thus rendered harmless.

Of all the tests to which cement is subjected, that for fineness is probably one of the simplest and yet one which causes much friction between the manufacturer and the user. This is due to the want of uniformity in carrying out the test. A weighed quantity is sifted on a sieve having a certain number of holes per sq. in., and ascertaining the quantity which will not pass through. In England there is no recognised standard as to the thickness of wire of which the gauze of the sieves are composed, and then again there is no agreement as to the length of time the sifting should be continued. The thicker the wire, the smaller the holes, and consequently, the greater the residue will be.

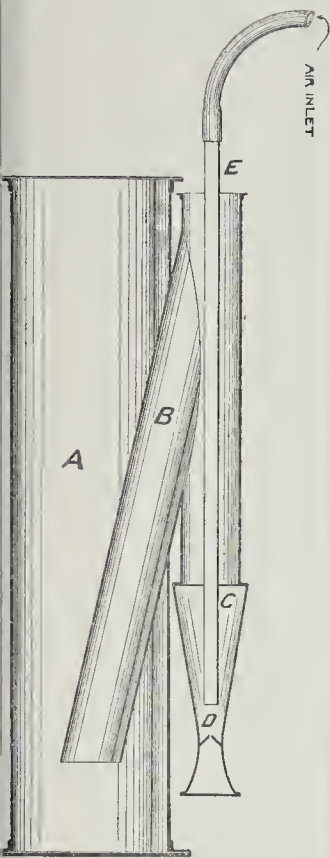
In America and on the Continent the standard adopted is that the thickness of the wire shall be one-half the size of the opening. In Table II.

It will be seen the thickness of wire of various sieves and the size of the opening according to is standard.

TABLE II.

Number of Meshes per Inch.	Thickness of Wire.	Width of Opening.
	Inch.	Inch.
0 x 180 .....	.0018	.0037
0 x 120 .....	.0028	.0055
0 x 100 .....	.0032	.0067
0 x 70 .....	.0044	.0087
0 x 50 .....	.0068	.0132
0 x 40 .....	.0084	.0167

The length of time during which sifting is performed has considerable effect on the results obtained, especially on the finer sieves. The author considers that no time limit can be given unless a standard method be employed. An operator using a sieve of, say, 6 in. diameter and sifting 100 grammes will take longer to get all the fine particles through than one using a sieve of, say, 10 in. diameter; then, again, two operators never sift alike; one may be quick in the movements of the sieve, another slow, and several other personal differences might be cited. The author considers



that the sifting should be continued till no appreciable quantity passes through the sieve. After this, prolonged sifting only grinds the particles one against the other and on the wire of the sieve so reducing some small enough to pass through the holes.

When the fineness on various sieves is required the most suitable method is to sift the material at once through a "nest" of sieves—that is, one within the other, the sample being put into the coarsest sieve and passing down to the finest. Sieves having a cover should be used, as it is very easy when sifting in an open bin to bounce some of the particles over the side. Where a number of siftings are done

daily, a mechanically-driven sieve is very useful and gives good results, especially for the manufacturer to use as comparisons.

Sieves should be examined frequently to see that none of the wires are displaced or broken, thus giving larger apertures, and, again, the wires of sieves which have constant use get worn thin, larger apertures being the result; or, if the sieves are damp when used, the fine cement will stick to the wires and so clog the holes. If the cement is damp, it should be dried in an air-oven and any lumps broken by gentle rubbing or pressure; in fact, some operators recommend drying all samples before sifting.

Sifting a sample of cement to determine what residue is left on a standard sieve, and so judge of its fineness, is not quite satisfactory.

As the cementitious value depends on the amount of flour in a cement, and it is practically impossible to make a sieve fine enough to determine this, many attempts have been made to find a substitute for the sieve test.

Mr. W. F. Goreham's flourometer appears to be the nearest approach to solving the problem. The diagram given on this page shows the apparatus.

A is a cylindrical vessel open at both ends, and when in use stands on a base-plate, which closes its lower end. Into a hole in the side is soldered one arm of a breeches pipe B. The other arm outside the cylinder is clamped to a conical glass vessel C, at the bottom of which is fixed a small metal cone. The top of this pipe is closed, and through the cover passes a tube E, which can be connected to a supply of compressed air. All the joints are made tight with indiarubber washers, to prevent the escape of flour or air into anywhere excepting the vessel A. To test a sample of cement, the necessary weight is placed in the glass vessel C and the apparatus clamped tightly. A current of air is passed down the pipe E, when the flour is carried upwards and eventually into the cylinder A. What is left in the vessel C is weighed, and so the flour calculated.

The air pressure depends on the material tested and the size of the apparatus. There appears to the author to be many possibilities of error in the apparatus, but, at any rate, when used in conjunction with the sieves, some valuable results can be obtained.

OBITUARY.

MR. J. HUNT.—Mr. Josiah Hunt, of 6, Queen Anne's-gate, Westminster, died on August 21, at the age of seventy-nine. Mr. Hunt was formerly in partnership with the late Mr. John Batstone, and for about twenty-five years they together carried on practice as quantity surveyors; this partnership was dissolved in 1875; since then Mr. Hunt continued the practice by himself until about six years ago, when failing eyesight caused him to retire.

GENERAL BUILDING NEWS.

CHURCH, OSMASTON-BY-DERBY.—The foundation-stone of the new Church of St. Oswald has just been laid by Sir Robert Rodney Wilmot, Bart., at Osmaston. The present scheme is for erecting only a portion of the church. The building, when completed, will be grouped round a quadrangle, having the church on the south, the schools on the west, and the vicarage on the east. In the centre of the quadrangle will be a large stone cross, from which paths will radiate to the various entrances. The first contract is for erecting two bays of the nave, with side aisles, and the chancel and side chapel with small stone and brick groined ceiling opening from the south aisle, corresponding with the north transept. The width of the nave will be 20 ft., and it will have an open timber roof, which will be surmounted by a floche directly over the chancel arch. The extreme width across the nave and aisles will be 42 ft. 6 in. The materials will be chiefly brick. The present contract will give seating accommodation for a congregation of about 200 people. The architects are Messrs. Currey and Thompson, of Derby, and the builder is Mr. R. Weston.

NEW MISSION CHURCH, POOLSBROOK, DERBYSHIRE.—The foundation-stone was recently laid of the new mission church which is being built at Poolsbrook. Messrs. McAllister and Tench, Cambridge, are the architects for the work, the builder being Mr. S. Stone, of Staveley. The total cost will be about 900.

NEW PRESBYTERIAN CHURCH, PORTSTEWART, IRELAND.—The memorial-stones were laid recently of a new Presbyterian church at Portstewart. The plans were prepared by Mr. Vincent Craig, C.E., of Belfast, and the builder is Mr. James Kennedy.

RESTORATION OF TRINITY HOSPITAL CHAPEL, LEICESTER.—The restoration and rebuilding of Trinity Hospital Chapel, Leicester, is now nearing completion. The architects, Messrs. Goodacre, recently made a survey of the chapel, and the following is an extract from their report:—"The chancel is generally in a fair state of repair, and it is only proposed to re-slate the roof of the chancel, together with the vestry leading out of the chancel. Some small repairs are also required to the roof. New spouting is to be fixed to the eaves, and the bellcot is to be repaired and painted. The portion forming the nave and transept of the chapel is in a very unsatisfactory and dilapidated state, and generally beyond repair. The whole structure is very damp. It is proposed to leave the old granite walls standing, and keep the building on exactly the same dimensions as at present. The third brick wall on the west side of the south transept is to be taken down and rebuilt with granite. Two new windows are to be inserted in the walls, and the present windows restored. All the granite walling is to be cleaned and pointed externally. The doorway in the north transept is to be built up on the inside with granite, and the buttress to be carefully restored. It is also intended to build the piers and arcade on the same lines as the original, and to put a new roof over the nave on the same lines as that over the chancel, thus opening up the old chancel arch. The floor is to be laid with wood blocks on a foundation of cement concrete. The old seats are to be removed. They are very rotten, and quite beyond repair; it is proposed to replace them with suitable seats or chairs. The chapel is also to be fitted with a service of gas pipes and brackets, and the building will be warmed by continuing the heating arrangements in the hospital into the chapel. Every care will be taken to preserve all old features of the original work. It is estimated that the restoration will cost about 1,000*l.*"

SCHOOL FOR DEAF AND DUMB, LIVERPOOL.—The new Council school for deaf and dumb children is situated in Olive-street, almost opposite the old institution. It has a frontage both to Olive-street and Crown-street of 120 ft. There are separate entrances for the boys and for the girls, from their respective playgrounds, and access is at once obtained to a hall, 28 ft. wide and 33 ft. in length, with a clear height to the tie-beams of the roof of 24 ft. In this hall the scholars will be marshalled, drilled, and inspected. Surrounding the hall are eight separate classrooms, with windows on the outside walls, whilst glazed partitions divide the classrooms from the hall. By means of two fireproof staircases, one for the boys and the other for the girls, a projecting gallery overlooking the hall is reached. This gallery connects with eight other classrooms modelled on the same plan as the classrooms below. On this floor are provided an assistant head teacher's room, and two rooms for male and female teachers respectively. The head master's room is on the ground floor. The architects are Messrs. G. Bradbury and Sons. As regards the alterations in the old institution, which will now only be used for the boarding and the home life of the children, the plans of Mr. Bradbury embraced the conversion of the large schoolroom, 40 ft. by 50 ft., to the purposes of a recreation-room for the boys, whilst the experiment is being tried in this room of providing each boy with a locker in which to deposit his personal belongings. A similar room is provided for the girls, who will have a room 40 ft. long by 20 ft. in width. In order to effect other improvements, so as to bring the institution up to date, the committee purchased a number of houses in Stanley-place, which have been demolished in order to allow of the admission of more air and sunlight into the playgrounds and buildings. Two other houses in Olive-street which were also purchased, are being converted into a laundry, and above the laundry there will be sleeping accommodation for the laundry maids, who are deaf and dumb, and former pupils of the institution. There is also a swimming bath lined with white tiles. One room, 25 ft. square, is also being converted into a bathroom. Each floor in the building is connected with two fireproof staircases. Electric lighting is also introduced.

SCHOOLS, GRIMSBY.—New school buildings have just been opened at Grimsby by Sir G. Doughty. They occupy a site bounded on the north by Harold-street, and on the south by Castle-street. The buildings cover an area of about 1½ acres in extent, and give a total accommodation for 1,460 children in the following departments:—Mixed school, 1,160; infants' school, 300; manual instruction room, laundry, and cookery centre. The premises comprise a mixed school, two stories high, fronting Harold-street, on the central hall

system, the ground floor having a large central hall, with two classrooms of same, which can be thrown into large hall when occasion requires by removing sliding partitions. To the right and left of central hall run corridors with four classrooms at either end. At the extreme ends of the buildings are arranged cloak-rooms, lavatories, teachers' rooms, and main entrances for junior and senior boys and girls; also stone staircases leading to the first floor school which is similar in every respect to the ground floor, having another central hall building. The reading-room is 50 ft. by 20 ft. In a central position between this room and the dining-room, with an area of 20 ft. by 15 ft., is the provision shop, or stores. There are lifts connecting the shop with the kitchens in the basement. The dining-room, 80 ft. by 41 ft., contains two ordinary fireplaces and a cooking fire, with lodgers' scullery. The kitchens, sculleries, pantries, and stores are in the basement. In the basement are also numerous lockers and storerooms for the accommodation of the things belonging to the boarders at the home. On the upper floors, approached from the large main staircase by three independent gangways, are the sleeping cubicles. These are arranged in groups for easy working and control. There are also two other stone staircases for exit in case of necessity. In view of any possible outbreak of fire, all the floors and staircases are fireproof. The number of cubicles for which arrangements were made in the original design was over 300. Over the billiard-room is a large flat roof, which it is designed shall be for the use of the men who sleep in the home, and who will thus be afforded an opportunity of getting fresh air.

THEATRE ROYAL, HALIFAX.—This theatre, which is now being rebuilt, occupies the site of the old theatre, including the old Shakespeare Hotel, the shop adjoining, and four cottages, etc., in Shakespeare-street. The site is rectangular and open on three sides. The auditorium is 54 ft. deep and 57 ft. wide within inner walls, and outside these are corridors and staircases 5 ft. wide up to outer wall. The ceiling will be about 50 ft. above the pit floor. The roof over the auditorium will be carried by steel principals in one clear span. The proscenium arch is 30 ft. wide and 30 ft. high, and the stage has a clear depth of 37 ft., and a width of 69 ft. The height of the grid is 50 ft. above stage floor. There are seven dressing-rooms provided for the artistes in close proximity to the stage, each fitted up with modern sanitary requirements. The staircases throughout the house are fireproof, as well as the partitions to the dressing-rooms. The theatre will accommodate about 2,000 people. The building has been designed and is being carried out by Messrs. Richard Horsfall and Son, architects, Halifax.

FREE LIBRARY, WALKLEY, SHEFFIELD.—The foundation-stone of the Free Public Library at Walkley, which, as far as the building is concerned, is the gift of Mr. Andrew Carnegie, was laid on the 9th inst. Mr. H. L. Paterson, of Sheffield, is the architect. The building is at the corner of South-road and Walkley-road, advantage having been taken of the site to place the main entrance at the angle. This takes the form of a circular portico, and gives access to the vestibule, 9 ft. wide, out of which open on the right and left respectively, the women's reading-room and the men's reading-room, the latter facing South-road, and the former facing Walkley-road. At the end of the vestibule opposite to the entrance are folding doors leading into the lending department, which fills up the angle between the men's and women's reading rooms. A curved counter separates the public space from the book store, which will be large enough to contain stacks for 15,000 books. These stacks will be arranged radiating. The committee and librarians' room is placed on the Walkley-road front, beyond the women's reading-room. Lavatories for the public as well as for the staff are provided. The building will be faced with rockies from the Bole Hill quarries, with Stoke stone dressings, and the roof will be slated. The floors will be laid with wood blocks on concrete. A dado of glazed brick will be provided in the vestibule, and the lavatories will also be lined with glazed brick. The interior woodwork will be pitch-pine varnished. It is proposed to heat the building by hot water at low pressure, and this will be combined with the ventilation, so as to secure efficiency in both. The contract for the work has been let to Messrs. D. O'Neill and Son, of Sheffield, the amount being 3,258*l.* 10*s.* and the glazed bricks are being supplied by the Wortley Fire Clay Company.

MISSION HALL, TURNBRIDGE WELLS.—The opening of the new Wesleyan Mission Hall, which has been erected in Hill-street, Turnbridge Wells, took place on the 17th inst. The building is of red brick, and accommodation is provided for 270 people. Mr. C. H. Strange was the architect of the work, the builder being Mr. Jarvis.

A PEOPLE'S PALACE, LIVERPOOL.—The "Workmen's Hostel," erected on the site of the old St. James's Market, Great George-street, out of the moneys of the David Lewis Trust Fund, is now, says the *Liverpool Daily Post*, open for the reception of lodgers. The building has its main frontage in Great George-place, its side fronting to Nile-street, and its back in Rathbone-street. The cost of building and furnishing it, it is understood, is about 100,000*l.*, and the structure has been erected from designs and under the superintendence of Mr. J. Francis Doyle, architect, Liverpool. The main frontage extends to 174 ft. The side frontage in Nile-street has a length of 146 ft. In all, the site of land embraces 220 ft. by 176 ft. The buildings are set back from the boundary some 21 ft. The materials used in the facing of the main outer walls are a special brick and terra-cotta, with green slates on the roof. The main entrance to the public hall and club-room is from Great George-place, and is 12 ft. wide. This means of ingress has a hall 50 ft. by 20 ft., arched and finished in tiles and faience. The public hall, which is 90 ft. by 42 ft., and 35 ft. high, is in the centre of the building, and will accommodate upwards of 600 persons. It is complete in its appointments, with separate stage entrances from Rathbone-street, stage boxes, gallery, and greenrooms for both sexes. Provision has been made for eleven sources of egress. All the staircases and floors are fireproof. The social club consists of a number of large rooms, a billiard-room, 67 ft. by 30 ft., two committee-rooms, three social

clubrooms, 50 ft. by 26 ft., and also a special clubroom and toilet facilities for females. To the south of the clubroom in the same site space has been left open for the erection of a gymnasium, 132 ft. by 54 ft. The "Workmen's Home" section of the building is approached and entered through turnstiles from Nile-street, off Great George-street. Just over the threshold the visitor finds himself at the office, and adjacent to this is the master's house. The quarters assigned to the superintendent are in the north-east corner of the building. The reading-room is 50 ft. by 20 ft. In a central position between this room and the dining-room, with an area of 20 ft. by 15 ft., is the provision shop, or stores. There are lifts connecting the shop with the kitchens in the basement. The dining-room, 80 ft. by 41 ft., contains two ordinary fireplaces and a cooking fire, with lodgers' scullery. The kitchens, sculleries, pantries, and stores are in the basement. In the basement are also numerous lockers and storerooms for the accommodation of the things belonging to the boarders at the home. On the upper floors, approached from the large main staircase by three independent gangways, are the sleeping cubicles. These are arranged in groups for easy working and control. There are also two other stone staircases for exit in case of necessity. In view of any possible outbreak of fire, all the floors and staircases are fireproof. The number of cubicles for which arrangements were made in the original design was over 300. Over the billiard-room is a large flat roof, which it is designed shall be for the use of the men who sleep in the home, and who will thus be afforded an opportunity of getting fresh air.

WAREHOUSE AT THE N.E.R. NEW BRIDGE STREET STATION, NEWCASTLE-ON-TYNE.—In connexion with the extensive improvements now being carried out at New Bridge Station one of the features is a good warehouse, now in course of erection. This warehouse, which has been designed by Mr. William Bell, Architect of the North-Eastern Railway Company, is entirely built of ferro-concrete, or the Hennebique Patent System. The dimensions of the New Bridge-street warehouse are 450 ft. in length, 130 ft. in width, and it will be 92 ft. in height. The basement is to be used as a low-level and the ground floor as a high-level goods station, the two levels being connected by wagon hoists. There will be six sidings on the ground floor into which the goods trains will be run for loading and discharging. As each loaded wagon may weigh upwards of 42 tons, this floor will have to support an enormous load when several trains are in the station at the same time. The pillars supporting this floor had to be a few as possible so as not to interfere with the heavy traffic in the low-level station; this rendered very large spans necessary for the main beams. Some of the beams in the building, having a span of 52 ft., are to be tested after completion under a superload of 400 tons, and each of the main pillars has to support over 1,100 tons. The first floor will be used for storage of goods; the second floor and part of the other floors are specially set apart for the storage of flour. The roof will be flat. The contractors are Messrs. Joseph Howe and Co.—*Newcastle Chronicle*.

FOREIGN.

FRANCE.—At the church of St. Germain l'Auxerrois, Paris, the frescoes painted by Joseph Guichard, from 1842 to 1845, have been undergoing restoration. These frescoes, which form the decorations of the chapel of Saint Landry, represent on the one side St. Landry founding the Hôtel Dieu; and on the other side, St. Landry providing food for the people of Paris.—At the Jardin des Plantes, Paris, the old monument called the Pavilion Chevrouil, dating from the time of Buffon, has been restored.—A competition has been opened for the selection of the best type for the small pavilions which are erected along the boulevards at Paris, on the occasion of the fêtes at Christmas and on the annual national holiday.—The church at Bussy Lettrée (Marne), an ancient and fine monument, has been seriously damaged by lightning.—A committee has been formed at Saint-Jean (Haute Vienne) for the erection of a monument to Corot, who was particularly fond of this district, and has illustrated many of its scenes in his pictures.—A railway track has been formed between the terminus station of Fayet-St. Gervais and the summit of the Aiguille-du-Gouët (Haute Savoie). The carriages are furnished with a cog-wheel system.—A new theatre is to be built at Vannes (Morbihan).—A new hospital is shortly to be built at Dunkerque.—A competition has been opened at Lyons for a block of artisans' dwellings.—M. Gustav Geffroy, the art-critic, has been created an Officer of the Legion of Honour; and the grade of Chevalier has been conferred on M. Georges Picard, the painter who so ably decorated the Galerie Lobau at the Paris Hôtel de Ville, and on M. Deverin, architect in the Department of Monuments Historiques.—The death is announced, at the age of fifty-six, of M. Louis Prêtre, whose name was well known among French artists and who for many years filled the office of Commissaire-Général of the Société des Artistes Français (Old Salon). M. Roybet has introduced his portrait in several well-known pictures.

GERMANY.—The memorial to the Emperor Frederic which is to be erected on the new bridge before the Emperor Frederic Museum is to be unveiled on October 23; the statue was the work of the late Rudolf Maison, of Munich.—A book is being published in

HOTEL, RYTON.—The new hotel, built for the firm of James Deuchar and Co., Ltd., situated at the junction of the Carlisle-road

in entitled "The English House" (Das nische Haus), by Hermann Muthesius; the book is to appear in three volumes, and will contain an exhaustive description of English terrace houses, their situations, their external and interior decorations, their gardens, etc., which are further explained by numerous illustrations.—The new Hospital for Inebriates at Beuthen, designed by the architect E. and G. Zillmann, is completed.—The architect Herr Ludwig Hofer has de- signed the plans for the Natural History Museum which the Senkenberg Natural Re- search Society is erecting in Frankfurt; the building is to cost 1,200,000 marks.

AUSTRIA.—The ancient Poor House in Vienna is to be demolished, as, owing to the sinking of the pavement, one floor is already below the street level; the new Poor House is to be erected on a different site. The Military Geographical Institute at Vienna is progressing under the management of Herr Stigler and Siedeck; the building cost 2,000,000 kronen.—The Roman Museum at Deutsch-Altenburg, on the Danube, was opened in the presence of the Emperor; the building was designed by Hermann Ohman and Kirstein, and cost 106,000 kronen.

SWITZERLAND.—The Museum at Bern is to be transformed into a building, suitable for use of the "Kantonalbank"; the work is being carried out by the architect Herr A. Schindler, of Zurich, and is to be completed in September, 1905.—A church and a statue in memory of the Empress Elizabeth are to be erected at Geneva.—The building of the Art Gallery at Zurich has been entrusted to the firm of Curgel and Moser, in Zurich.

MISCELLANEOUS.

CALIFORNIA TIMBER.—In a report sent home by Mr. Bennett, British Consul at San Francisco, dealing with the trade and commerce of the State, it is mentioned that the receipts of pine, spruce, and fir lumber from California, Oregon and Washington were 365,653,142 ft. of Redwood from all California mills, valued at \$55,555,555 ft. Of this nearly 10,000,000 ft. was sent to Australia, 2,250,000 ft. to the United Kingdom, and nearly 5,000,000 ft. to Mexico. The Californian redwood is described as being "the most important timber product of the State. Redwood burns with difficulty, charring as a rule, and is practically oblivious to decay when used in damp places. It is one of the most durable woods known, and is greatly used in railway and engineering construction, and frequently for the lining of the great tunnels of the Ontario Power Company at Niagara, but the recommendation was not acted upon."

ROMAN REMAINS. CAERWENT.—Within the last few days discoveries have been made at Roman city of Venta Silurum (Caerwent, Monmouthshire). The south gate has been discovered, and an inscribed stone has been found to light. The city was rectangular in form, and had one entrance near the centre of each of its four sides. Remains of all that part on the south were previously known to exist, while the site of the south wall was supposed to be marked by a lane which here passed through the city walls. The gate itself has, however, come to light 50 ft. further west, and forms a most interesting parallel to the north gate. Each had an internal and an external wall, with a span of about 9 ft., the outer being to a great extent preserved. The south gate, which has the spring of an arch on each side, while the north gate the spring on one side only. Between the two arches was a rectangular space with a ceiling, over which must have passed a walk which led along the top of the city walls. The gateway had been blocked with a stone-work in Roman times. The inscribed stone which has been discovered is a dedication to Mars by M. Nonius Romanus, was set up in the year 124 A.D.—*Birmingham Daily Post.*

MEMORIALS IN LONDON.—A tablet has just been affixed on the front of No. 67, Wimpole-street, W., where Henry Hallam lived during the period 1819-40; the house is that which Hallam mentions in a well-known stanza in "The Gateways to London"—"The much-severed cradle of the birthplace of Lord Beaconsfield seems to be now determined by the fact that a similar tablet has been placed in the wall of No. 22, Theobald's-road, formerly King's-road, near Bedford-row. The places which contend for that honour are St. Mary Axe, No. 2, James-street, and No. 6, on the west side of the Salisbury-square; but it appears that the tablet did not remove to the last-named

house until some years after Lord Beaconsfield's birth in 1804. A tablet has also been affixed to No. 1, Devonshire-terrace, at the corner, north-west, of Marylebone-road, to commemorate the residence there, in 1839-51, of Charles Dickens.

DRURY-LANE THEATRE.—The theatre will be closed until next Christmas for the carrying out of certain structural alterations and improvements, in accordance with the terms of the award recently made by Mr. John Slater, F.R.I.B.A. Mr. Slater was appointed by the First Commissioner of H.M. Office of Works to act as arbitrator between the London County Council and the directors of the Theatre Royal, Drury-lane.

IMPROVEMENTS IN STEPNAY AND THE VICINITY.—The Borough Council of Stepney have unanimously decided at a special meeting held a few days ago, to carry out a widening of the western portion of Great Alie-street, Whitechapel, in which their offices are situated, in connexion with the scheme for a widening of Mansell-street, and to put in force the provisions of Michael Angelo Taylor's Act (of 1816) for the acquisition of the property required for the improvement. Two-thirds of the cost will be borne by the London County Council, whose recommendations for a further widening of Narrow-street, near Dowson's Dock, Limehouse, are under consideration of the Borough Council.

BRITISH WEIGHTS AND MEASURES.—A provisional committee of the British Weights and Measures Association, formed for the defence, standardising, and simplifying of British weights and measures, has just been constituted. The committee, which consists of ten members, includes Mr. A. H. Adams, of the Sturtevant Engineering Company, London; Mr. R. Kaye Gray, President of the Institute of Electrical Engineers; Mr. Henry Lovatt, of Wolverhampton, builder and contractor; and Mr. Thomas Parker, of London and Wolverhampton, consulting engineer, who is now engaged upon the electrification of the Metropolitan Railway line and rolling stock.

THE ORDNANCE SURVEY.—The annual report of the Ordnance Survey for the twelve months ended on March 31 has just been issued. The revised outline maps, to the 1-in. scale, of the United Kingdom are now completed and published; the completion is also announced of the revised four-mile outline map of the United Kingdom, as well as of the coloured four-mile map, together with the ten-mile revised map, in both outline and colour, with hills, of England, Wales, and Scotland. Rapid progress is being made with the two-mile map of England, and the 1-in. coloured map of England and Wales is finished. The report states that the authorities will revise the 1-in. outline maps of the United Kingdom at intervals of fifteen years, having finished the current series with the maps of Ireland, which were published in the course of the period under review.

UNIVERSITY COLLEGE SCHOOL.—For the new school buildings a site has been acquired in West Hampstead, at the junction of Arkwright-road and Frognal. It is proposed to expend an estimated sum of 50,000*l.* upon the erection of buildings to accommodate 450 boys, with provision for extension hereafter to accommodate 150 more.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—According to returns supplied by sixty-eight Employers' Associations, whose members are estimated to employ about 83,500 building operatives of all classes, and by trade unions, with an aggregate membership of about 180,000, employment in the building trades generally continued dull during July, and, on the whole, showed little change as compared with June. It was, however, rather worse than a year ago. With bricklayers' employment is reported as dull, and about the same as a month and a year ago. It is moderate with masons in England, but dull in Scotland. With carpenters and joiners employment is bad. The percentage of unemployed trade union carpenters and joiners was 57 at the end of July, compared with 63 in June, and 33 a year ago. Employment with painters generally has been dull, and about the same as a month ago in England, but worse in Scotland. It is worse generally than a year ago. With plasterers and plumbers employment has been bad. The percentage of unemployed trade union plumbers was 104 at the end of July, compared with 99 at the end of June, and 67 a year ago. With slaters and tilers in England and Ireland employment continued dull, but in Scotland they were fairly well employed.—*The Labour Gazette.*

Legal.

WEST END ANCIENT LIGHT DISPUTE.

In the Vacation Court on Wednesday, counsel applied, *ex parte* to Mr. Justice Bigham, on behalf of the plaintiff in the case of Milton v. Maskelyne, for an interim injunction over next Wednesday, restraining the defendant from increasing the height of his building so as to obstruct the plaintiff's ancient lights. The learned counsel stated that, if the defendant's building operations were allowed to go on uninterrupted until Wednesday next, his building would by then be completed, and it was unusual for the court to order a building to be pulled down when once it had been put up. If his lordship looked at the affidavits which had been filed, he would find that there was an agreement to submit the question to arbitration.

His lordship: Are you issuing a writ notwithstanding the agreement?

Counsel: Yes. If the judge finds that there is not in the letters a sufficient agreement, then we shall rely on our common-law rights to restrain the building.

His lordship asked what the building complained of was.

The learned counsel replied that it was the St. George's Hall, in Langham-place, the plaintiff's building abutting on the south side of the defendant's building.

In the result, his lordship declined to grant the injunction, but gave the plaintiff leave to serve notice of motion with the writ for Wednesday next.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

12,168 of 1904.—J. KOCKS: *Covers for Key-holes.*

This invention relates to a cover for key-holes, the object being to obviate the disadvantages appertaining to keyholes, in that it is impossible for a listener not only to listen to the conversation occurring in a room, but also to see through the keyhole into the room. The invention consists in placing over the key-stem, before insertion of the key into the lock, a disc or plate of elastic material.

12,985 of 1904.—J. W. CRAVEN and J. H. CRAVEN: *Machinery for Making Briquettes, Bricks, Blocks, and Tiles, such as Briquettes of Artificial Fuel, or Bricks or Blocks of Sand and Lime, etc.*

A machine for making briquettes, bricks, blocks, etc., consisting of a horizontally-arranged mould-table, in combination with a vessel, or mill, immediately above the line of travel of the moulds, and provided with an opening, with which the moulds successively come into coincidence, and with blades or fillers rotating in opposite directions, so as to equally pass the matter from the said vessel or mill through the said opening into the said moulds.

20,057 of 1903.—E. B. L. MORRIS: *Automatic Fire-Extinguishing Appliances.*

This consists in the combination of a pair of valves of different areas, connected by a hollow spindle working on a guide, means for allowing water to enter the spindle when the valve is opened and enclosing it there so that the valve is prevented from closing again.

12,439 of 1904.—F. HUBBER and W. G. HIGGS: *Electric Fire Alarm, and the like Signalling Apparatus.*

An electric fire alarm, and like signalling apparatus, consisting in the combination of a mechanically-operated ring of contacts with relay, line, and battery connexions, said ring of contacts being brought into operation by means of an electro-magnet operated by a push, or automatically, whereby a predetermined number of intermittent synchronous impulses will be transmitted.

16,003 of 1903.—P. TIMOFFEEFF: *Construction of Pavement, Covering, or Flooring for Roadways, Pathways, Floors, Stairs, Ships' Decks, Permanent Way of Railways, etc.*

A new paving, flooring, or covering for roads, pathways, floors, stairs, ships' decks, railways, etc., consisting of basket-like, flat structures, formed by either plating or weaving metal strips or wires, or by means of stamped and perforated steel, or other suitable metal, such structures being formed open on one side with shallow side edges, so as to be adapted to be bedded firmly with their open sides downwards upon the ground or upon a layer of sand, or the like.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

16.—By KIVELL & HARRIS (at Stratton).
nny's, Cornwall.—Dizzard, Trengayor,
creek, and Trelay farms, 610 acres, f.s. £4,400
stock, Cornwall.—Trewint and Foxwell
arn, 202½ acres 1,120
stons, Cornwall.—Treffida Farm, 120½
res, l. 1,200
et 17.—By A. DOWELL (at Edinburgh).
Perthshire.—Estate of Glenfar, 814
res, net rental 5394. 15,500
LEONARD CAVEY & Co. (at Catford).
Hill.—19, Hurstbourne-rd., n.t. 79 yrs.,
r. 54. 10s., y.r. 284. 290
d.—394, Stanstead-rd. (s.), u.t. 74 yrs.,
r. 94, y.r. 404. 305
t 18.—By ROYCE, EVENS, & CARPENTER.
n.—20, Rushton-st., n.t. 30 yrs., g.r.
r. 10s., w.r. 40, 8s. 295
Huntingdon-st., n.t. 65 yrs., g.r. 74, w.r.
r. 10s. 395
Hoxton-st. (s.), n.t. 65 yrs., g.r. 244,
r. 52. 370
d 7, Reeves-pl., l., w.r. 40, 10s. 500

structions used in these lists.—E.g. for freehold
d-rent; l.g. for leasehold ground-rent; l.g. for
ved ground-rent; g.r. for ground-rent; r. for rent;
freehold; c. for copyhold; l. for leasehold; p. for
son; e.r. for estimated rental; w.r. for weekly
; q.r. for quarterly rental; y.r. for yearly rental;
or unexpired term; p.a. for per annum; yrs. for
la. for lane; st. for street; rd. for road; sq. for
e; pl. for place; ter. for terrace; cr. for crescent;
r. avenue; gds. for gardens; w. for ward; g.t. for
t. h. for beer-house; p.h. for public-house; s. for
s. for shops; ct. for court.

MEETINGS.

SATURDAY, SEPTEMBER 3.
ociation of Municipal and County Engineers.—
nd District Meeting to be held at Birmingham,
and Rea District Drainage Board's Works.

OCTOBER 6 and 8.

id of the Royal Institute of British Architects to New-
-upon-Tyne.—The following, amongst other arrange-
s, are being made in connexion with the visit of
stitute to Newcastle: The Northern Architectural
ation Reception Committee will receive the visiting
embers of the Institute at the County Hotel, at
n, on October 6th. His Worship the Mayor of
astle will receive the members at 10.0 a.m., on
er 7th. After which, about an hour will be
sed to the reading and discussion of a paper on
icism in Architecture." The President of the
S.A. will take the Chair. The Cathedral and the
ty House will be visited. The Northern Archi-
tural Association will entertain the visiting mem-
bers on the 8th at the County Hotel, at
n. Arrangements will be made for those mem-
bers who wish to do so, to visit during the afternoon
nday. Places of interest in the immediate neigh-
hood. In the evening a dinner will be held, and
aturday, October 8th, arrangements will be made
those who desire to do so, to visit Hexham Abbey
the Roman Station at the Chesters, Chollerford,
and the New Shipbuilding Sheds at Messrs.
& Hunter's, Wallsend.

TO CORRESPONDENTS.

B. (Below our limit).—A. G. (Amounts should
be stated).

NOTE.—The responsibility of signed articles, letters,
papers read at meetings rests, of course, with the
author.

We cannot undertake to return rejected communica-
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All communications regarding literary and artistic
matters should be addressed to THE EDITOR; those
relating to advertisements and other exclusively busi-
ness matters should be addressed to THE PUBLISHER,
not to the Editor.

PRICES CURRENT OF MATERIALS.

Our aim in this list is to give, as far as possible, the
average prices of materials, not necessarily the lowest.
Quantity and quality obviously affect prices—a fact
which should be remembered by those who make use of
this information.

BRICKS, &c.

1 Stock, 1 16 0	per 1000 alongside, in river.
2 Stock, 1 13 0	" " " "
3 Stock, 2 12 0	" " " "
4 Stock, 2 10 0	" " " "

BRICKS, &c.—(continued).

Flattons £ s. d.	
Red Wire Cuts 1 10 0	per 1000 at railway depôt.
Best Fareham Red 1 13 0	" " " "
Best Red Pressed 3 12 0	" " " "
Best Blue Pressed 5 0 0	" " " "
Staffordshire 4 4 0	" " " "
Do. Bullnose 4 10 0	" " " "
Best Stourbridge 4 8 0	" " " "
Fire Bricks 4 8 0	" " " "
GLAZED BRICKS.	
Best White and 13 0 0	" " " "
Ivory Glazed 12 0 0	" " " "
Stretchers 12 0 0	" " " "
Quoins, Bullnose, 17 0 0	" " " "
and Flats 19 0 0	" " " "
Double Stretchers 16 0 0	" " " "
Double Headers 15 0 0	" " " "
One Side and two 19 0 0	" " " "
Ends 20 0 0	" " " "
Two Sides and 20 0 0	" " " "
one End 20 0 0	" " " "
Splays, Cham 20 0 0	" " " "
terred, Squints 12 0 0	" " " "
Best Dipped Salt 12 0 0	" " " "
Glazed Stretch- 14 0 0	" " " "
ers, and Header 15 0 0	" " " "
Quoins, Bullnose, 14 0 0	" " " "
and Flats 15 0 0	" " " "
Double Stretchers 15 0 0	" " " "
Double Headers 15 0 0	" " " "
One Side and two 15 0 0	" " " "
Ends 15 0 0	" " " "
Two Sides and 15 0 0	" " " "
one End 15 0 0	" " " "
Splays, Cham 15 0 0	" " " "
terred, Squints 15 0 0	" " " "
Second Quality 2 0 0	" " " "
White and 2 0 0	" " " "
Dipped Salt 2 0 0	" " " "
Glazed 2 0 0	less than best.

Thames and Pit Sand £ s. d.	
Thames Ballast 7 3	per yard, delivered.
Best Portland Cement 30 0	per ton, "
Best Ground Blue Lias Lime 21 0	" "

NOTE.—The cement or lime is exclusive of the ordinary
charge for sacks.

STONE.

BATH STONE—delivered on road wag- £ s. d.	
ons, Paddington Depôt 1 6	per ft. cube.
Do. do. delivered on road waggon, 1 8	" "
Nine Elms Depôt 1 8	" "
PORTLAND STONE (20 ft. average) —	
Brown Washed, delivered on road 2 1	" "
waggon, Paddington depôt, Nine 2 1	" "
Elms depôt, or Fimlico Wharf, 2 2	" "
White Washed, delivered on road 2 2	" "
waggon, Paddington depôt, Nine 2 2	" "
Elms depôt, or Fimlico Wharf, 2 2	" "

Ancaster in blocks 1 11	per ft. cube, del'd. rly. depôt.
Beer 1 10	" "
Greenshill 2 4	" "
Darley Dale in blocks 2 4	" "
Red Corshill 2 5	" "
Clochara Red Freestone 2 4	" "
Red Mausfield 2 4	" "

YORK STONE—Robin Hood Quality.

Scrapped random blocks 2 10	" "
6 in. sawn two sides 2 3	per ft. super. "
landings 4 sizes 2 6	" "
(under 40 ft. super.) 2 6	" "
6 in. rubbed two sides 2 6	" "
ditto, ditto 2 6	" "
3 in. sawn two sides 0 11	" "
slabs (random sizes) 0 7	" "
2 in. to 2½ in. sawn one 0 6	" "
side slabs (random 0 6	" "
sizes) 0 6	" "

HARD YORK—

Scrapped random blocks 3 0	per ft. cube, "
6 in. sawn two sides, 2 8	per ft. super. "
landings to sizes 2 8	per ft. super. "
(under 40 ft. super.) 2 8	per ft. super. "
6 in. rubbed two sides 3 0	" "
ditto 3 0	" "
3 in. sawn two sides 1 2	" "
(slabs random sizes) 0 5	" "
2 in. self-faced random 2 3	per ft. cube, del'd. rly. depôt.
flags 2 3	per ft. cube, del'd. rly. depôt.
Hopton Wood (Hard Bed) in blocks 1 2	per ft. cube, del'd. rly. depôt.

SLATES.

in. in. £ s. d.	
20 x 10 best blue Bangor 2 6	per 1000 of 1200 at r. d.
20 x 12 " 13 17 6	" " " "
20 x 10 first quality " 13 0 0	" " " "
20 x 12 " 13 15 0	" " " "
18 x 8 " 7 5 0	" " " "
20 x 10 best blue Port- 12 12 6	" " " "
maide " 6 12 6	" " " "
20 x 10 best "Bureks un- 15 17 6	" " " "
fasting green " 13 7 6	" " " "
20 x 12 " 13 5 0	" " " "
18 x 8 " 10 5 0	" " " "
20 x 10 permanent green " 11 12 6	" " " "
18 x 10 " 9 12 6	" " " "
16 x 8 " 6 12 6	" " " "

TILES.

Best plain red roofing tiles 42 0	per 1000 at rly. depôt.
Hip and Valley tiles 3 7	per doz. " "
Best Broseley tiles 50 0	per 1000 " "
Do. Ornamental tiles 52 6	" " " "
Hip and Valley tiles 4 0	per doz. " "
Best Runbon red, brown, or 57 6	per 1000 " "
briddled do. (Edwards) 60 0	" " " "
Do. Ornamental do 4 0	per doz. " "
Hip tiles 3 0	" " " "
Valley tiles 51 9	per 1000 " "
Best Red or Mottled Stafford 54 6	" " " "
shire do. (Peakes) 4 1	per doz. " "
Do. Ornamental do 3 8	" " " "
Hip tiles 48 0	per 1000 " "
Valley tiles 50 0	" " " "
Best "Rosemary" brand 4 0	per doz. " "
plain tiles 3 8	" " " "
Best "Hartshill" brand 50 0	per 1000 " "
plain tiles, sand faced. 47 6	" " " "
Do. pressed 50 0	" " " "
Do. Ornamental do 4 0	per doz. " "
Hip tiles 3 6	" " " "
Valley tiles 15 10 0	" " " "
Do. Ornamental do 14 10 0	" " " "
Battens: best 2½ in. by 7 in. and 11 10 0	" " " "
3 in., and 3 in. by 7 in. and 8 in. 12 10 0	" " " "
Battens: best 2½ by 6 and 3 by 6 1 0 0	less than
8 in. and 8 in. 1 0 0	7 in. and 8 in.
Do. pressed 0 10 0	less than best.
Do. Ornamental do 9 0 0	" " " "
Hip tiles 8 10 0	" " " "
Valley tiles 0 10 0	more than

WOOD.

Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in. £ s. d.	
Deals: best 3 by 4 15 10 0	16 10 0
Battens: best 2½ in. by 7 in. and 3 in., and 3 in. by 7 in. and 8 in. 14 10 0	15 10 0
Battens: best 2½ by 6 and 3 by 6 11 10 0	12 10 0
Do. pressed 1 0 0	less than best.
Do. Ornamental do 0 10 0	" " " "
Hip tiles 9 0 0	" " " "
Valley tiles 8 10 0	" " " "
Foreign Sawn Boards—	
1 in. and 1½ in. by 7 in. 1 0 0	more than
2 in. by 4 in. and 2 in. by 6 in. 1 0 0	battens.
2 in. by 4½ in. and 2 in. by 5 in. 1 0 0	At per load of 30 ft.
3 in. 4 10 0	5 0 0
4 in. 4 5 0	4 10 0
5 in. 3 12 6	3 15 0
6 in. 3 0 0	3 10 0
7 in. 2 15 0	3 0 0
8 in. 3 5 0	3 15 0

JOINERS' WOOD.

White Sea: first yellow deals, At per standard.	
3 in. by 11 in. 23 0 0	24 0 0
3 in. by 9 in. 21 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in. by 11 in. 17 0 0	18 10 0
Second yellow deals 3 in. by 11 in. 13 10 0	20 0 0
" " 3 in. by 9 in. 17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in. by 11 in. 13 10 0	14 10 0
and 9 in. 15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in. by 11 in. 11 10 0	12 10 0
Petersburg: first yellow deals, 21 0 0	22 10 0
3 in. by 11 in. 18 0 0	19 10 0
Do. 3 in. by 9 in. 13 10 0	15 0 0
Battens 16 0 0	17 0 0
Second yellow deals, 3 in. by 11 in. 14 10 0	15 0 0
Do. 3 in. by 9 in. 14 10 0	15 0 0
Battens 11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in. 13 10 0	14 0 0
Do. 3 in. by 9 in. 13 0 0	14 0 0
Battens 10 0 0	11 0 0
White Sea and Petersburg:—	
First white deals, 3 in. by 11 in. 14 10 0	15 10 0
" " 3 in. by 9 in. 13 10 0	14 10 0
Battens 11 0 0	12 0 0
Second white deals, 3 in. by 11 in. 13 10 0	14 10 0
" " 3 in. by 9 in. 12 10 0	13 10 0
Battens 9 10 0	10 0 0
Pitch-pine: deals 16 10 0	20 0 0
Under 2 in. thick extra 0 10 0	1 0 0
Yellow Pine—First, regular sizes 28 0 0	upwards.
Odiments 29 0 0	" "
Second, regular sizes 29 0 0	" "
Yellow Pine odiments 25 0 0	" "
Kauri Pine—Planks, per ft. cube. 0 3 6	0 5 0
Danzig and Stettin Oak Logs—	
Large, per ft. cube 0 2 6	0 3 6
Small " " 0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube. 0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as 0 0 8	0 0 9
inch do. do. 0 0 7	" "
Dry Mahogany—Honduras, Ta- 0 0 9	0 1 0
basco, per ft. super. as inch 0 1 6	0 2 6
Selected, Figury, per ft. sup. as 0 1 6	0 2 6
inch do. do. 0 10 0	0 1 0
Dry Walnut American, per ft. sup. 17 0 0	21 0 0
as inch do. do. 0 4 0	" "
American Whitewood Planks, Per square.	
per ft. cube. 0 13 6	0 17 6
Prepared Flooring—	
1 in. by 7 in. yellow, planed and 0 13 6	0 17 6
shot 0 14 0	0 18 0
1 in. by 7 in. yellow, planed and 0 16 0	0 18 0
matched 0 16 0	0 18 0
1½ in. by 7 in. yellow, planed and 0 12 0	0 14 6
matched 0 12 0	0 15 0
1 in. by 7 in. white, planed and 0 15 0	0 16 6
shot 0 11 0	0 13 6
1 in. by 7 in. white, planed and 0 11 0	0 13 6
matched 0 10 0	0 11 6
1 in. by 7 in. do. do. 0 11 6	0 13 6
1 in. by 7 in. do. do. 0 11 6	0 13 6
6 in. at 6d. to 9d. per square less than 7 in.	

COMPETITIONS AND CONTRACTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Windows and Minor Alterations, Eye Workhouse	Hartismere Guardians	H. Warnes, Clerk, Castle-street, Eye	Aug. 27
Farmer's Arms Hotel, Hafod	do.	A. G. Evans, Architect, Pontypridd	do.
Stabling, Trade-lane, Cardiff	do.	E. G. C. Down, Architect and Surveyor, 31, High-street, Cardiff	do.
Alterations to House at Werthorh	Messrs. Sessions & Sons, Ltd.	Felling Education Committee	Aug. 23
Repair of Queen-street, West Vale	Greetland U.D.C.	H. Miller, Architect, Council Buildings, Felling	do.
Curb, Setts, and Flags for Queen-street	do.	R. Horsfall & Son, Surveyors, 22A, Commercial-street, Halifax	do.
Painting Fire Brigade Station, Gibbet-street	Hallifax Corporation	J. Lord, C.E., Borough Engineer, Town Hall, Halifax	do.
Sludge Tanks and Press House, Sewage Disposal Wks.	do.	do.	do.
Widening Radstone-lane	Breckley R.D.C.	W. J. Treadwell, District Surveyor, Middleton Cheney, Banbury	do.
220 yds. of Cast-Iron Sewerage Main	Workop U.D.C.	R. J. Graham, Royal Bank Buildings, E.C.	do.
House, Llantarnam	Executors of late H. Lawrence	J. H. Rennie & Co., Architects, Skinner-street, Newport	do.
Byre at Monimules	Caledonian Railway Co.	J. Wittet, Architect, Elgin	do.
Superstructure of Bridge, Hamilton	do.	Engineer, Buchanan-street Station, Glasgow	do.
Footbridge	do.	do.	do.
Private Improvement Works	Boothle Corporation	Borough Engineer, Town Hall, Boothle	Aug. 30
Bulls, Nuts, and Rivets	Southern Mahratta Railway Co.	E. Z. Thornton, Secretary, 46, Queen Anne's-gate, S.W.	do.
Bridge Building, Round Thorn, Baginbun	Backlow R.D.C.	G. Leigh, Clerk, Union Offices, Knutsford	do.
Road Improvements, Lavernock	Llandaff and Dinas Powis R.D.C.	J. Holden, Surveyor, Llandaff-chambers, 35, St. Mary-st., Cardiff	do.
Road Metalling, Michaelstone-super-Ely	do.	do.	do.
Hauling Clew Hill Stone	do.	do.	do.
110 Tons of Steel Flat-bottomed Rails	Leeds Corporation	City Engineer's Office, Leeds	do.
Thirty Standards Railing Sleepers for 2 1/2" Gauge	do.	do.	do.
Twenty-five Standards Pitch Pine for Bridges, etc.	do.	do.	do.
Road Improvements, Pendoylan	Llandaff and Dinas Powis R.D.C.	J. Holden, Surveyor, Llandaff-chambers, 35, St. Mary-st., Cardiff	do.
Road Improvements, Peterstone	do.	do.	do.
Road Improvements, Waverley	do.	do.	do.
Painting Sanatorium Buildings, etc., Scarroff	Leeds Sanitary Committee	Clerk of Works, Scarroff Hospital, Leeds	do.
Plumbing Materials, Corporation Waterwks., Masham	Leeds Corporation	City Engineer's Office, Leeds	do.
Sundav Schools, etc., Frindsbury	do.	E. F. Cobb, Architect, 20, High-street, Rochester	do.
New Wing and Alterations at Farm Buildings, Torehead	do.	J. Wittet, Architect, Elgin	do.
Steel Rails and Fish Plates	East India Railway Co.	W. Young, Secretary, Nicholas-lane, E.C.	Aug. 31
Electric Light Sub-Station, Adelaide-st., The Docks	Cardiff Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
1,000 Tons Broken Granite Road Metalling	Uxbridge U.D.C.	E. Birks, Engineer, Town Hall, Uxbridge	[do.]
Resisting Kilsyth Mans	Kenilworth U.D.C.	S. Douglas, Engineer, Council House, Kenilworth	do.
Enlargement, etc., of Llandyri Church	Heritors of Kilsyth	N. P. Patinson, Borough Surveyor, Town Hall, Gateshead	do.
Caretaker's House adjoining Club, Morthyr Vale	do.	W. Griffiths, Architect, Llandely	do.
Iron Railings, Guide Bridge Station	Audenshaw U.D.C.	W. Dowdeswell, Architect, Treharris	do.
Library, Lichfield-street, Walsall	Walsall Corporation	W. Clough, Engineer, 2, Guide-lane, Audenshaw	do.
Electric Light Installation, Albion-road School	Edinburgh School Board	J. S. Gibson, Architect, 5, Old Bond-street, London, W.	do.
Sunday Schools, etc., Horden P.M. Church	do.	S. W. Woodford & Co., Consulting Engineers, 122, George-street, Edinburgh	do.
Sinking a Pit at Tarbrax	do.	J. Walton Taylor, St. John-st., Grainger-st.-west, Newcastle-on-Tyne	do.
Seaweeding Contract	do.	Manager, Tarbrax Works, Cobbinshaw	Sept. 1
Paving Streets	Blaydon U.D.C.	R. Biggins, Sanitary Inspector, Council Offices, Blaydon	do.
Distiller's House, Dalwhinnie Distillery	Gateshead Corporation	N. P. Patinson, Borough Surveyor, Town Hall, Gateshead	do.
Warehouse, Dalwhinnie Distillery	do.	A. Mackenzie, C.E., County-buildings, Kingussie	do.
Malting Barns, Dalwhinnie Distillery	do.	do.	do.
Pipes for Supply Cistern, etc.	do.	do.	do.
General Repairs	do.	do.	do.
Sanitary Annex at Workhouse, Penistone	Guardians	G. A. Wildc, Architect, 9, Bank-street, Sheffield	do.
1,000 yds. of Asphaltic Footpath	Walsend Corporation	G. Hollings, Borough Engineer, Walsend	do.
Sixteen Houses, Rowe's-square, Rhymersey	Victoria Building Club	W. H. Trump, Solicitor, Rhymersey, Mon.	Sept. 2
Completing Thirteen Houses, Rowe's-sq., Rhymersey	do.	do.	do.
Greenhouse, Strood Cemetery	Joint Burial Committee	A. B. Acworth, Architect, 114, High-street, Strood	do.
Builder's Work at Gasworks, Down District Linn, Ayr	Committee of Management	Resident Medical Superintendent, Downpatrick	do.
Laying Sanitary Pipes, Byker	St. Anthony's Estate	A. S. Dinning, 21, Ellison-place, Newcastle-on-Tyne	do.
600 Tons of X Broken Granite	Stamford Town Council	F. R. Ryman, Borough Surveyor, 8, St. Mary's-street, Stamford	Sept. 3
400 Tons of XX Broken Granite	do.	do.	do.
Street Works	Hoole U.D.C.	H. Davies, Building Surveyor, 14, Newgate-street, Chester	do.
Iron Bridge at Pitt's Wellow	Romsey R.D.C.	J. Alsop, Clerk, The Abbey, Romsey	do.
Cottages	Londonderry R.D.C.	M. A. Robinson, Engineer, Richmond-street, Londonderry	do.
66 Houses & Two Shops, Cwneel Est., Cwmaman	Aberneol Building Co.	J. Llewellyn Smith & Davies, Architects, Aberdare	Sept. 5
Stoneware Pipes, etc. (Carton Sewerage)	Thornton, etc., Joint Sewage Com.	A. Hinde, A.M.Inst.C.E., 44, Abingdon-street, Blackpool	do.
Main Sewers, etc., Garton (Contract 13)	do.	do.	do.
Painting at Workhouse, Gravelly Hill	Aston Guardians	J. North, Clerk, Union Offices, Vauxhall-road, Birmingham	do.
Broken Mountain Limestone and Gravel	Mountain Ash U.D.C.	W. G. Thomas, Surveyor, Public Offices, Mountain Ash	do.
Native Stone, etc.	do.	do.	do.
Hauling Stone, etc.	do.	do.	do.
600 yds. of Asphaltic, Midland-road	Royston U.D.C.	J. Raley, Clerk to Council, Barnsley	do.
Foundations for Pumping Machinery, Mildmay-road	Chelmsford Corporation	P. Griffith, Engineer, 54, Parliament-street, Westminster, S.W.	do.
Making Milestone-lane	Handsworth U.D.C.	H. Richardson, Engr., Council House, Handsworth, Birmingham	do.
600 lineal yds. of Granite Kerb	Stamford Corporation	F. R. Ryman, Borough Surveyor, 8, St. Mary's-street, Stamford	do.
650 yds. of Concrete Flag Paving	do.	do.	do.
Refrainage, etc., Page Green Schools, Broad-lane	Tottenham Education Committee	W. H. Prescott, Surv., Coombes Croft Hse., 712, High-rd., T'ham	do.
190 yds. of Fencing and Gates, Cathays Park	Cardiff Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
Taking Down and Re-erecting 250 yds. of Fencing	do.	do.	do.
Heating Wards, Sick Asylum, Devons-road, Brouley	Poplar and Stoney Asyl. Managers	J. & W. Clarkson, Architects, 130, High-street, Poplar, E.	Sept. 6
500-ton Sand Pump Hopper Steam Dredger	Wexford Harbour Commissioners	Planners & Given, Engineers, 17, Water-street, Liverpool	do.
Road Material	Woking U.D.C.	G. J. Woodbridge, Surveyor, Bank Chambers, Woking	do.
Machinery for Self-acting Incline Railway	Crookston Bros., Glasgow	Sheffield & Twickenrow, Engrs., 15, New B'dge-st., Newcastle-on-Tyne	do.
Cemetery Fencing at Lemington	Newburn U.D.C.	H. Gregory, Newburn-on-Tyne	do.
Erection of Workmen's Dwellings	Barking Town U.D.C.	C. J. Dawson, Architect, East-street, Barking	do.
Buildings for Boys and Girls, Lichfield-street, Walsall	Governors of Queen Mary Schools.	Bailey & McConnell, Architects, Bridge-street, Walsall	Sept. 7
Additions, etc., Ardilly Bldgs., Pollock's Town, Cairn	G.W. Railway	Engineer, Paddington Station	do.
Sinking Wells, Crumlin, Co. Dublin	S. Dublin Guardians	J. P. Condon, Clerk, Boardroom, James-street, Dublin	do.
Tools, Portland Cement, etc.	S. Dublin R.D.C.	T. J. Byrne, J. James-street, Dublin	do.
Street Paving and Repairs	Rochester Corporation	W. Banks, City Surveyor, Guildhall, Rochester	do.
Materials	Newport (Salop) U.D.C.	A. Massey, Surveyor, Newport, Salop	Sept. 8
* New Coastguard Buildings at Hove	Gosport, etc., U.D.C.	H. Frost, Surveyor, Council Offices, Gosport	do.
* New Coastguard Buildings at Finesnes	Admiralty	Superintending Engineer, H.M. Dockyard, Portsmouth	Sept. 9
1,000 sq. yds. of Filtration Material at Sewage Works	do.	Director of Works Dept., Admiralty, 21, Northumberland-ave., W.C.	do.
Footbridge over Canal at Scotson Fold	Raddiffe U.D.C.	Supt. Engr., H.M. Naval Estb., Rosyth, near Inverkeithing, N.B.	Sept. 10
Outside Painting, Stanwix Cemetery	do.	W. L. Rothwell, Engineer, Council Offices, Raddiffe	do.
Roadworks, Buckhurst-lane	Stanwix Burial Board	The Curator	do.
Erection of Chimney Shaft	Sevenoaks U.D.C.	S. Towson, Surveyor, Council Offices, Sevenoaks	Sept. 12
Council Buildings, High-street, Epsom	Torquay Town Council	Borough Engineer, Town Hall-chambers, Torquay	do.
Electric Pump, Mains, etc.	U.D.C.	H. Creed, Clerk, Epping, H.M. Dockyard, Portsmouth	Sept. 13
* Supply of Portland Cement	Ennisorthy District Lunatic Asy.	H. T. Harris, C.E., 30, Parliament-street, Dublin	do.
Sewerage and Surface-water Drains	Edmonton U.D.C.	G. Eedes Eades, Engineer, Town Hall, Edmonton	do.
Dust Collection	do.	do.	do.
* Supply of Broken Granite	do.	do.	do.
* Supply of Stoneware Pipes	do.	do.	do.
Railway Siding, Cape Hill, Smeck	do.	R. J. Butland, Town Hall, Edmonon	do.
Widening Tresenny Bridge, Groomont	Abergavenny R.D.C.	Council's Engineer, Town Hall, Edmonon	do.
		James & Leith Lea & Sons, Surveyors, 19, Cannon-st., Birmingham	Sept. 17
		J. Gill, Surveyor, 4, Brown-road, Abergavenny	Sept. 19

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be delivered. Includes entries for Council Buildings, Sewer Works, and Public Offices.

COMPETITION.

Table with 4 columns: Nature of Work, By whom Required, Premiums, and Designs to be Delivered. Includes an entry for Public Offices by Wallasey U.D.C.

Those marked with an asterisk (*) are advertised in this Number.

Competitions, lv. Contracts, lv. vi. viii x. Public Appointments, xvii.

STEEL CURRENT.—Continued from page 227.

Table listing JOISTS, GIRDERS, &c. with columns for In London, or delivered, and prices in £ s. d.

OILS, &c.

Table listing various oils like Raw Lined Oil, Boiled Oil, Turpentine, etc., with prices per gallon.

CLONMEL.—For erecting three new blocks of buildings at Clonmel District Lunatic Asylum.

Table listing names and amounts for Clonmel project, including J. P. Good, J. M. Stuart, etc.

METALS.

Table listing various metal items like Iron Bars, Steel Bars, Galvanized, etc., with prices per ton.

VARNISHES, &c.

Table listing various varnishes like Fine Pale Oak Varnish, Superfine Pale Elastic Oak, etc., with prices per gallon.

COLCHESTER.—For erecting a board-room, munition-room, pay-offices, etc., at the Workhouse.

Table listing names and amounts for Colchester project, including G. Grimwood & Sons, T. J. Ward, etc.

LEAD, &c.

Table listing lead items like Sheet, English, 3lb. and up, with prices per ton.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays.

GILBERDIKE.—For alterations and additions to the Council School.

Table listing names and amounts for Gilberdike project, including Mr. Bernard B. Stamford, T. S. Ulthorne, etc.

HEREFORDSHIRE.—For alterations to Pontillas Court, Herefordshire.

Table listing names and amounts for Herefordshire project, including W. P. Lewis & Co., B. & C. v. a. n., etc.

LEYTON.—For renovating work at Grange Park Congregational Church.

Table listing names and amounts for Leyton project, including J. Penn, F. J. Coxhead, etc.

LONDON.—For alterations and additions to St. Mark's Council Schools.

Table listing names and amounts for London project, including Mr. William Pywell, Godson & Sons, etc.

LONDON.—For the erection of new schools, Oaklands-road, Hanwell, W.

Table listing names and amounts for London project, including Mr. William Pywell, Patman & Fotheringham, etc.

LONDON.—For rebuilding Nos. 311, 313, 315, Walworth-road, S.E.

Table listing names and amounts for London project, including Mr. Allan Stuart, J. Hunt & Son, etc.

ENGLISH SHEET GLASS IN CRATES.

Table listing glass items like 1/4d, 3/4d, 1d, etc., with prices per per ft. delivered.

Credit old materials.

Table listing names and amounts for credit old materials, including E. Saunders & Sons, F. J. Williams, etc.

LONDON.—For erecting new vegetable kitchen, extension of male bathroom, and conversion of coal shed into foul linen laundry, at Renfrew-road Workhouse, for the Lambeth Guardians. Messrs. Woodward, Brooks, & Latta, surveyors, 69, Kenning Oval, S.E.:

	Time for completion.
I. W. Leonard & Co. Mason	£1,186 4 0 .. 16 weeks.
J. W. Aldridge	1,185 6 0 .. 12 weeks.
W. Lawrence & Sons	1,094 0 0 .. 14 weeks.
W. J. Coleman & Sons	1,073 0 0 .. 26 weeks.
Cruise & Baldwin	1,045 0 0 .. 10 weeks.
J. J. Richards	1,055 0 0 .. 14 weeks.
H. Kent	998 0 0 .. 10 weeks.
H. Bragg & Sons, 66, Robars-street, Brixton*	007 0 0 .. 12 weeks.

LONDON.—For external and internal painting, etc., Norwood Schools, for the Lambeth Guardians. Messrs. Woodward, Brooks, & Latta, surveyors:—

	Time for completion.
Spencer, Santo, & Co.	£351 0 0 .. 2 months.
N. Bounrau	328 9 0 .. 1 month.
Hammond & Son	317 5 0 .. 3 months.
J. J. Richards	311 9 6 .. 2 months.
R. Athey	301 10 0 .. 6 weeks.
Buckland Bros.	273 10 0 .. 2 months.
Higgs & Hill	270 0 0 .. 5 weeks.
B. Bristol & Son	264 5 0 .. 2 months.
M. McCarthy	263 0 0 .. 2 months.
G. Cooper	261 10 0 .. 2 months.
J. Scott Penn	261 0 0 .. 1 month.
P. McCarthy	258 13 0 .. 2 months.
Leonard & Mason	257 5 0 .. —
Lole & Co.	254 0 0 .. 1½ months.
W. Young	251 0 0 .. 2 months.
H. Bragg & Sons	238 4 4 .. 2 months.
Wontner & Co., Ltd.	235 7 0 .. 6 weeks.
L. Mills	222 10 6 .. 2 months.
Langdon & Clark	215 10 0 .. 1 month.
J. Parsons	211 10 0 .. —
H. Kent, Albion-road, Lewisham*	180 15 0 .. 3 weeks.

* Does not include shoring.

LONDON.—For rebuilding the premises Nos. 37, 39, and 41, Leman-street, Whitechapel, E., for Mr. Harris Woolf. Mr. W. A. Longmore, architect, Bridge-chambers, Walthamstow:

A. Slatter, Walthamstow, N.E.* .. £3,300

MACCLESFIELD.—For sewage tanks and filters, for the Corporation of Macclesfield. Mr. R. E. W. Berrington, Engineer, Bank-buildings, Wolverhampton. Quantities by Engineer:—

J. Owens, 8, St. Mark's-road, Wolverhampton* .. £9,849 [Twenty tenders received.]

Whole.

J. S. Tregenza ..	£760 0	Walters & Burnett	£701 18
<i>Masonry Only.</i>			
J. Lavers	£507 0	J. Nicholas ..	£359 9
C. Tregenza	419 0	Penzance*	369 10
R. Hosking	369 10		

Carpenter and Painter.

J. Rowe	£345 0	W. Greuffell	£281 10
J. Berryman	336 10	J. Hosken, sch.	279 0
J. E. Hosken	325 0	J. Bohman	275 0
J. James	320 0	G. Cara, Pen-	260 0
H. Peake	289 0	zance*	260 0

NORTHFLEET (Gravesend).—For painting, etc., the High-street and Lawn-road Schools and cookery kitchen, and the Dover-road School and cottage at Northfleet Council Offices, for the Kent Education Committee:—

B. M. Carpenter. £323 5 0 | J. B. Lingham .. £278 17 0

A. Best

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R. W. Hunter & Co.	£5,002 11 5	D. Davies	£4,410 0 0
E. R. Evans	4,970 0 0	W. D. Davies	4,150 0 0
Cassmore & Perkius ..	4,950 0 0	W. Watts	4,130 0 0
J. Lewis	4,740 0 0	Williams & Sons	3,990 0 0
G. Griffiths & son	4,660 0 0	H. Rowlands, New Trade ..	3,896 10 6
Latty & Co.	4,639 3 7		

STOCKTON-ON-TEES.—For private street improvement works, for the Corporation. Mr. M. H. Sykes, Borough Engineer, Town Hall, Stockton-on-Tees:—

J. G. Spooner, Westbourne-street, Stockton-on-Tees

TYNEMOUTH.—For 400 lineal yds. of pipe sewer, etc., at Willington, for the Rural District Council. Mr. A. S. Dinning, surveyor, 21, Ellison-place, Newcastle-on-Tyne:—

J. W. Robson, Newcastle

WELLINGBOROUGH.—For 1,040 tons of granite and 108 tons of granite chippings, for the Urban District Council:—

Bardon Hill Granite. Ellis & Weraud, Wellingborough .. 9s. 9d. .. 2½ in. Ellis & Weraud, Wellingborough .. 7s. 0d. .. ½ in.

WHITCHURCH (Salop).—For alterations and additions to Union, for the Guardians. Mr. W. Webb, architect, Whitechurch:—

G. Dodd

WHITSTABLE.—For new cloak-room for the Albert-street Schools, Whitstable, for the Kent Education Committee. Mr. A. A. Kemp, architect. Quantities by the architect:—

C. Welby

WISBOROUGH GREEN (Sussex).—For extension and alteration of the Council School, for the West Sussex County Council. Mr. F. Wheeler, architect, Bank-chambers, Carfax, Horsham:—

I. Waters & Sons, Forest Row, Sussex

WOODFORD (Essex).—For the erection of detached house, Grove-road, Woodford, for Mr. E. J. Walford. Mr. Money Marsland, architect, 68, Great Tower-street, E.C.:

Parry & Jones

J. Jolliffe

J. J. ETRIDGE, JR.

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The Builder.

VOL. LXXXVII.—No. 3213.

SEPTEMBER 3, 1904.

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Council Chamber, Town Hall, Deptford.....	Messrs. Lanchester and Rickards, Architects.
Eastbourne Technical Institute.....	Mr. Philip A. Robson, A.R.I.B.A., Architect.
Decorative Design: "The Steam Hammer".....	By Mr. W. J. Stamps.
Decorative Design: "Selection of the Emblems of York and Lancaster".....	By Mr. Lancelot Crane

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Ancient Egyptian Building.



IN his latest contribution to the history of architecture,* M. Choisy returns to the consideration of a subject he had already treated in his general history published in 1899. He simplifies his description, however, of Egyptian architecture, and puts forward a new theory to account for the undulating curves found in the crude brick walls at Abydos and Karnak. In the more detailed account he gives of the Egyptian methods of building vaults and domes in unburnt brick without centring, he shows many varied methods of strengthening the vaults which have not hitherto been noticed. By far the most important part of the whole work is that devoted to stone construction, in which M. Choisy deals with the quarrying and transport of materials—the raising of and fixing in position the great blocks of stone used in the Pyramids and Temples, and the precautions taken when lowering the same into their position, as also those for the obelisks and for the porteulises in the pyramids. His description of the processes employed comes virtually to us as a revelation, and shows a knowledge of engineering which is far beyond that which could be imagined as possessed by one of the earliest races of mankind.

The chapter which deals with the waving curves in brick is illustrated by many photogravures at the end of the book, the first four of which, at Philæ and Esneh, represent undulating courses in masonry to which M. Choisy's new theory would not apply. It had generally been supposed that these courses were precautions taken against earthquakes, but M. Choisy points out that in some cases such walls are found on the natural rock where there could be no fear of a settlement. In his "History of Architecture" M. Choisy pointed out that when building walls the masons made use of a stretched cord to regulate the course levels, a system employed from time immemorial down to the present day, but to suggest, as he does in his History, p. 19, that as the cord sunk in the middle the course followed the sinking—"Le cordeau fléchit en son milieu: le lit suit la flexion du cordeau directeur"—does not appeal to us.

In his present work he puts forward another theory which is more reasonable, though whether it can be proved in every instance is doubtful. As there is no rainfall in Egypt, a wall in that country in crude or unburnt bricks did not require that protection which was given to it in other countries, as, for instance, the layers of burnt brick, or tiles, on the top of the walls, and the stucco casing given to the sides in Greece and Rome; but, when in the proximity of water, M. Choisy points out that certain hygrometric changes take place—the moisture from below is drawn up into

the brickwork by the heat of the sun during the day, whilst at night the condensation of this moisture causes the bricks to swell and dislocate the wall; or if built on an incline, gives a tendency to slide downwards. M. Choisy points out that the concave bed would prevent the latter, and by leaving open joints at the junction of the concave and convex beds these would simply close up at night. There are, however, undulating courses found in brick walls at Abydos which are far distant from the river or any inland lake to which this theory would not apply, and certainly in the walls represented in the first four photogravures the moisture could not affect the masonry, nor could it well be drawn up through the same to the crude brick above, so that further research is required here.

When, however, we come to the account given by M. Choisy of the transport of large blocks of stone, and the raising and bedding them in their position, not only is the evidence given of the most convincing character, but it is the result of observation which it was open to anyone to make; no excavations were required, everything was above ground, and the features to which M. Choisy calls attention have been seen by hundreds of travellers without any attempt to follow their meaning or object before he entered the field.

The theory commonly accepted, that the blocks of stone were hauled up inclined planes of sand which were afterwards removed, had its origin in a traditional custom which is sometimes

* L'Art de bâtir chez les Égyptiens. Par Auguste Choisy. 5m. J. Fo. Paris: Edouard Rouveyre; 1901.

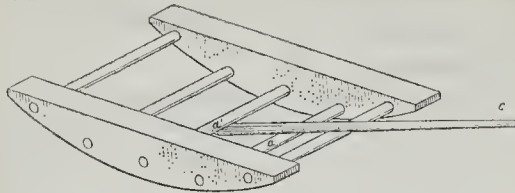


Fig. 1. The Rocker.

actually employed at the present day. One of the columns in the Great Hall at Karnak was taken down stone by stone, and, after a new solid foundation had been laid, was rebuilt by the same method, there being from 100 to 150 men, women, and children employed in raising the mound and afterwards removing it. But this system, M. Choisy points out, could not have been followed in the case of the erection of the great Pylons, sometimes over 100 ft. in height, as there would be no room for the inclined planes of requisite length. Moreover, with an inclined plane in the proportion of one in height to only two in the base, 500 men would be required to haul up a stone weighing 15 tons, and where could those 500 men have been posted? On the inclined plane itself their feet would have slipped, and there would be no room on the narrow platform of the pylon. This led M. Choisy to the conclusion that the stones must have been raised in the same way as they were on the pyramids, where the scaffolding, if it may be so termed, existed in the natural construction of the pyramid itself; that is to say, the stones were raised step by step either by means of levers of various kinds or by an apparatus which he calls the *ascenseur oscillant* (rocking cradle). This cradle consisted of two beams of timber of segmental shape, which were framed together with stout wooden bars (Fig. 1). Numerous models of this apparatus have been found in the tombs, and they have always been assumed to be centerings for an arch or vault; but M. Choisy points out that all their arches and vaults were built without centering, so that they must have served some other purpose. On to this cradle, according to his theory, the blocks of stone were shifted by means of an inclined plane, and then by the use of levers and small blocks of stone introduced one side or the other as the cradle was rocked the stone was gradually raised, and ultimately shifted on to the upper bed. In the case of the pyramids the height of the step varied from 4 to 5 ft. Herodotus, quoting the description given him by the priests as to the erection of the pyramids, says that: "The blocks were raised from one stage to the other by means of machines made of short pieces of wood"—a description which, in the main, agrees with M. Choisy's supposition, and with his conjectural illustration, shown in our Fig. 2 (page 82 in the book). In support of his theory, so far as the erection of the pylons is concerned, M. Choisy calls attention to the remains of the temporary step platform which was erected in the great court of the Temple at Karnak, and as those remains are shown in two photogravures on Plate XIV., and must be known to every traveller, there can be no dispute as to their existence. As this pylon was erected about 700 B.C., twenty-six

centuries have elapsed since this temporary staging was built. The remains have generally been supposed to be works of late date raised when the courts were taken possession of by squatters, but the illustrations show a series of walls parallel to one another with steps setting back, a construction of no use as a habitation. In pushing his inquiry further M. Choisy ascertained that in the side portico, which this mound partially masked, the capitals of the columns have been left *en bloc*, or, as he says, "brut," and Plate XV. shows us one of these capitals, the stones of which have never been worked down. As will be seen in Plate XIV., the temporary scaffolding consisted of a series of walls parallel to one another and built up against the pylon; as the pylon rose in height, the walls may have been built further out and stone slabs laid across or steps from wall to wall. M. Choisy, however, on p. 90, gives a diagram in which the base of the staging was built out to its full depth at first. In his conjectural restoration on p. 89 it will be seen that this series of platforms was raised to its full height only in the centre of the pylon wall (Fig. 3). The Egyptian masons having raised the stones in the centre, lowered them down to the sides; that is to say, they made use of the stone courses of the pylon itself, and this may have been done in some cases by commencing the erection of the same at one or both ends. That this was done in the case of ordinary walls we gather from M. Choisy's diagram on p. 96, in which the ordinary stone courses serve as steps, up which the blocks were raised.

The last chapter in M. Choisy's book, which deals with the transport and raising into position of monoliths, is perhaps the most remarkable, because it not only describes how these huge blocks—sometimes weighing over 200 tons—were quarried, taken down the Nile long distances and raised into their position, but shows the minute precautions which had to be taken when lowering them into position, as in the case

of obelisks, or bedding them side by side as in the roof of Karnak (where some of the stone slabs weigh 40 tons each), with so close a joint that it is impossible to insert a sheet of paper between the adjoining blocks.

On the pedestal which carries the obelisk brought from Luxor in the Place de la Concorde, at Paris, has been engraved a diagram showing how the obelisk was first raised and then lowered into its position, a work which taxed the resources of the French engineer. From the number and size of those erected in Egypt, however, with no explanatory diagrams of the way in which the work was done, we must assume that the precautions which the Egyptians found it necessary to take were the result of many experiences and perhaps failures. Queen Hatasu, the daughter of Thothmes III., boasts that one of the larger obelisks, over 100 ft. high, which she set up at Karnak, was quarried at Assuan, brought down the Nile (about 150 miles) set up on its pedestal and gilded, all within the short space of seven months. On p. 124 M. Choisy gives a diagram showing how he considers the obelisk were raised and lowered into their positions, and he puts forward the theory that, in order to avoid the risk of fracture of the base, circular cylindrical sacks of sand were employed on which the obelisk descended. When these sacks were cut the sand ran out, allowing of the gradual descent of the obelisk on its base. This theory is substantiated by the fact that on the top of the pedestals from which obelisks have been taken are small semi-circular grooves, in which the empty sacks sunk, and he shows various types of grooves all destined to avoid a sudden sinking of the obelisk. M. Choisy also describes the way in which the immense blocks of granite were lowered in the corridors leading to the tomb chambers, in order to close them after the body of the king had been deposited. These blocks were temporarily supported by wooden posts, and before removing these, sand sacks were piled up underneath, and then cut through one after the other. The last section of the chapter is devoted to the methods adopted in Greece, Assyria, and Palestine for the hauling, raising into position and building of the monoliths employed in those countries, and M. Choisy refers us to the descriptions given by Vitruvius and Pliny of the systems adopted in the Temple of Diana at Ephesus, which differed materially from those employed by the Egyptian masons.

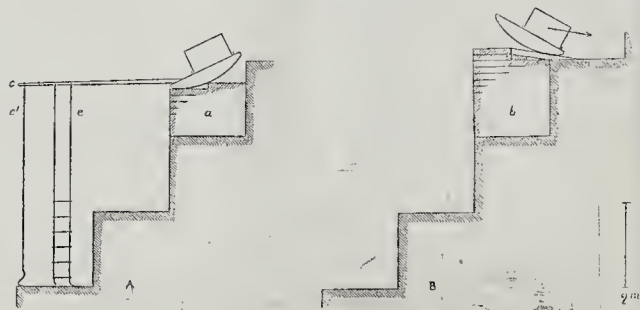


Fig. 2. The Rocker in Use.

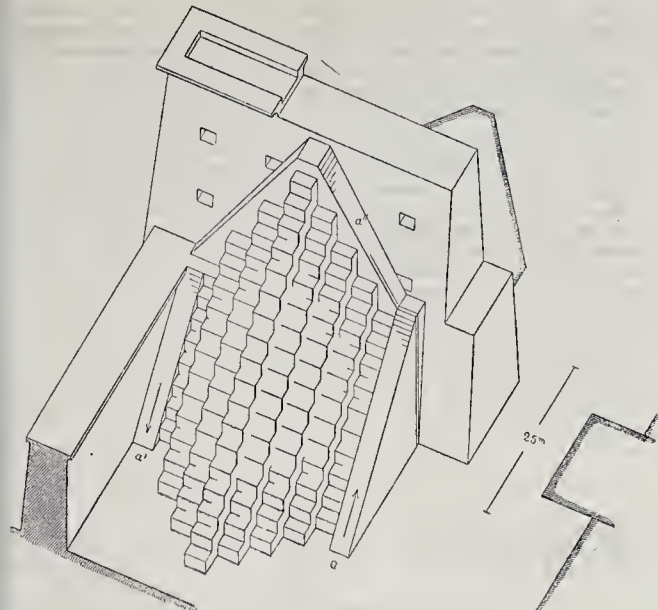


Fig. 3. Temporary Step Walls for Raising Materials.

We have only been able to deal in this article with some of the leading problems put forward in M. Choisy's work; although compressed into a small compass—for there are only 135 pages of text, and about twenty lines in a page—the result of his researches might be expanded into several volumes. The book is illustrated with over 100 diagrams, which explain his theories in the simplest and clearest manner, and the addition of the forty-eight photogravures at the close of the work is of special value, because they represent views which the ordinary photographer would not deem worthy of taking, but which prove that in the greater number of cases the theories put forward have a most substantial basis of fact.

In selecting the author of this book as the recipient of the Royal Gold Medal this year, the Institute has added a very distinguished name to their list. M. Choisy has contributed materially to our knowledge of the construction of bygone ages, which, as a rule, has never been properly approached by the ordinary historian. His early training as a mathematician and engineer specially fitted him for the researches to which he has devoted the greater portion of his life, and his accurate powers of observation and his acute reasoning faculties have led to a most successful and interesting result.

THE SANITARY INSTITUTE.—The usual course of educational lectures for sanitary officers will be commenced at the Parkes Museum on Monday, September 12, the succeeding lectures following on Mondays, Wednesdays, and Fridays up to November 25. Among the lecturers are Mr. E. J. Steegmann (on Elementary Physics and Chemistry); Mr. J. Priestly (Sanitary Law); Messrs. W. C. Tyndale, J. Wright Clarke, and A. Saxon Snell (various constructional subjects); and Mr. J. E. Worth (Water Supply and Sewage Disposal). The usual course of visits of inspection and demonstration commences on September 17 with a visit to the Wimbledon Sewage Works. Full particulars can be obtained from the Secretary, at the Parkes Museum, 72, Margaret-street, W.

THE REPORT OF THE COMMITTEE ON WORKMEN'S COMPENSATION.

THE recently-issued Report of the Departmental Committee on the law relating to Workmen's Compensation is one of the most thorough and valuable reports which has been made for a long time. It gives a clear impression of the results of the present law, of its strong and of its weak points, and it indicates distinctly the means which are required for its improvement. Briefly stated, two main points stand out pretty conspicuously; the first is that on the whole the existing law has worked satisfactorily, even allowing for some defects; and the next is that the trend of business and of law as based on recent legislation is towards an inevitable end—namely, that the workman shall receive in all cases a reasonable indemnity against pecuniary loss by injuries sustained in the course of his employment, and that the employer will have to protect himself against severe loss by the system of insurance—a system which is becoming more and more, in all sorts of ways, an essential part of modern life.

Since 1897, it must be borne in mind, a fundamental change has taken place in the legal relations of employer and employed; that is to say, the employer in a large number of cases has become liable to pay compensation to a workman who has been injured, without a breach of contract or of any negligent act on the part of the employer. One must realise now that the question for the future must be, not whether the workman should continue to have a legal right to be relieved from some portion of the loss caused by industrial accidents, but what amendments are required in the law providing for that relief, as regards the general method and detached means of affording it; whether any and what changes are required in the extent or

limit of that relief, or in the security for its provision and maintenance; and whether similar privileges should be extended to classes of workpeople "not now within the law." No legislation can, of course, give an injured workman complete compensation. All that can be obtained is that some portion of his loss should be borne by the employer—in the last resort of course by the general public. The Report is so full and at the same time so concise, that it is impossible to do more here than indicate some of the most interesting questions which it raises. Its careful perusal will well repay the time spent on it by any one interested or concerned in this question.

As regards the question of litigation, it is satisfactory to find that though there has necessarily been much of it, the Committee consider that actual fighting in the law courts "has been very small when compared with the great number of cases settled by agreement, without any recourse whatever to legal aid or to proceedings in court." Thus Colonel Bird, Chairman of the Builders' Accident Insurance Company, says that the cases taken into court are 1½ per cent. of the claims. The public is accustomed to read day by day reports of these cases, but it is not in possession of the number of accidents and claims. Satisfactory, however, as this state of things is, the Committee clearly are of opinion that by some amendments of the law the percentage of litigation to claims can be still further reduced. For example, as our readers well know, much litigation has taken place in regard to the meaning of the expression "by means of a scaffolding" in relation to the work of construction or repair, to the meaning and extent of the word "repair," and to the limitation of the benefit of the Act to building, some part of which exceed 30 ft. in height. We take these as instances of the ground of litigation. Many similar points arise in regard to other than building operations. But the trend of the Report will be clearly seen by the recommendation of the Committee in regard to this part of the Act. "We see," they write, "no effective remedy for these anomalies unless employment in building operations is brought altogether within the Act, and the distinctions depending upon height of building, use of scaffolding, employment of machinery, and character of work, are entirely done away with. Some objections on the part of the employers have been raised to this proposal, and they are not without force; they apprehend great increase of claims for small accidents, which ought not to come within the Act." But the protection at hand to the employer is the system of insurance, and, therefore, the Committee conclude that "on the whole the arguments for extending the Act so as to cover all building operations must prevail, . . . building operations should include work upon all erections upon the surface, including the work of preparing for and carrying out the foundations, for the erection, and be irrespective of the material used in construction." This is the conclusion which we have over and over again pointed out was the inevitable result of the existing law: Injustice to certain classes of workmen

by their exclusion from the benefits of the Act cannot be counterbalanced by less inconvenience to certain classes of employers by their non-liability, and the small contractor can protect himself just as well as the large contractor by means of this system of insurance. Nor need the small employer be unduly apprehensive because the Committee have come to the conclusion that "the pecuniary burden imposed by the Acts upon the employer has not been excessive." The introduction of so fundamental a change as was created by the legislation of 1897 and 1900 must necessarily have caused some dislocation of the ordinary modes of business; but time works its accommodations, and so the extension of the principles of the Acts will be less noteworthy than the first step in the change caused by their becoming law. But the mere fact that an employer is legally liable to pay compensation to his workmen does not necessarily give him the funds so to do, and the Committee evidently foresee that a further extension of the principle of compensation will be urged by giving the workman some kind of security for his compensation. At present an insolvent employer, or an insolvent insurance company, may defraud a workman of compensation. The idea of the Committee appears to be that the State at some future time may have to establish some kind of system of National Insurance and enact regulations in regard to the formation and conduct of insurance companies. This would not be so difficult a matter as to guarantee in any way the solvency of an employer, which is a difficulty which can only be met "by the substituting for the personal liability of the individual employer the security of a fund, the solvency of which was for all practical purposes assured." At present we think the time has not arrived for dealing with this part of the question; the main point is to simplify in the immediate future the law so as to lessen litigation, and enlarge the benefit of recent legislation so that all classes of workmen may equally be sharers in its advantages.

The advantages of the Act have, however, apparently not been felt by all workmen, for the Committee note that the tendency of recent legislation has been "to increase the difficulties of old men finding and retaining employment," and to lessen the employment of weak or partially maimed persons. In relation to these several classes it may be that the Act can be amended so as to lessen the liability of the employer in such cases, and thus to give them more chances of obtaining work. "We suggest," say the Committee, "as a minimum in the case of old persons, 5s. per week for injury, and, in the case of death, leaving dependents 25l." This is a point of great social importance, which will no doubt receive consideration; for the tendency to restrict employment to young and vigorous men only tends to make more acute the problem of old age relief generally. As we have already said, we can do no more than indicate some of the conclusions of this admirable report—a document which must remain invaluable for a long time to come.

We may, however, refer briefly to yet another point of a general character,

namely, the effect of the Acts on the safety of workmen. Here the Committee come to the conclusion, and we can do no more than state it briefly, that the operation of the Act of 1897 has not had any marked or ascertainable effect one way or the other upon the safety of workmen. If anything, it would seem that the tendency of the Act has been rather against the increase of safety, because there appears to be an inclination on the part of justices not to exercise their powers of inflicting fines on a high scale for breaches of the Factory or other Acts, where bodily injury has been sustained in consequence of a breach of a statutory obligation. It is clear that the Legislature did not intend that compensation to a workman in such a case should take the place of a fine for breach of a statutory duty; and if it is proved that magistrates take this view of the law, it should be pointed out to them by the Home Office that they are acting wrongly. Here, again, is another instance of the far-reaching effect of the recent legislation, which has so vitally affected the position both of employers and workmen.

A NOTE ON THE LAW OF LIGHT.

THE case of *Kine v. Jolly*, recently decided by Mr. Justice Kekewich, is one of extreme importance in regard to the law of light, since it is the first case in which the right of parties to an injunction has had to be considered since the decision of the House of Lords in *Colls v. Home and Colonial Stores*. We have in these columns already drawn attention on several occasions to the important change in the law effected by this decision of the House of Lords, since no longer is any practical obstruction of light sufficient to give the party setting up ancient lights a right of action, but the obstruction has now to amount to a nuisance—that is, to such a deprivation of light as to render the premises substantially less fit for the purposes of occupation or habitation; moreover, the judgments in the House of Lords raised some doubts as to how far the remedy of mandatory injunction was appropriate in such cases, in place of a simple decree for damages.

The decision in *Kine v. Jolly* is of especial interest, since in the first place a mandatory injunction had been granted, but stayed pending an appeal. Before the appeal came on for hearing, the decision in *Colls v. Home and Colonial Stores* had been delivered in the House of Lords, and, consequently, the Court of Appeal remitted the action to the Court below for a re-hearing under the altered condition of the law. The plaintiff had a house at Acton, and complained of an infringement of ancient lights by the erection of a house adjoining. Taking the several heads of claim separately, it was proved that the drawing-room was deprived of direct sunlight; but since it remained a well-lighted room, fit for the purposes of a drawing-room, the learned judge was constrained to find at the second trial that no cause of action was proved within the decision of the House of Lords. No better illustration could be offered of the change now effected in the law;

every householder must consider the loss of direct sunshine a serious detriment to a house, and one which affects its saleable and letting value; yet, since no one is any longer to be deemed to have an absolute right to all the light, such a deprivation gives no right of action, but is *damnum sine injuria*. The morning-room offered greater difficulties; it remained a room sufficiently well lighted to be used as a morning-room, but the learned judge found it had sustained such a loss of cheerfulness that the obstruction amounted to a nuisance; and, moreover, the damage being substantial and affecting one of the most useful rooms of the house, and the defendants being in possession of full knowledge that ancient lights existed, and the plaintiff having acted fairly with no view to extortion, the court considered this to be a case for a mandatory injunction and not for damages alone.

One other point remains to be noted. There was some objection to the light to the hall, an obstruction which the judge found would not in itself constitute a nuisance, but which, in conjunction with the obstruction of light to the morning-room, was held to amount to a nuisance, since the learned judge decided that under the new ruling the obstruction to the house as a whole must be regarded.

The court urged the parties to come to terms if they were dissatisfied with the judgment; but, in the interests of the general public, we trust these important questions may soon come before the higher tribunals for decision, and the rights of parties receive clear definition.

NOTES.

THE address delivered by Municipal House-owning. Dr. William Smart before the British Association last week, in which he dealt with the subject of the housing of the poor, should be read with considerable interest. Professor Smart has been for two years engaged on a commission which has been investigating this question in Glasgow. It is to be observed that the Professor is strongly against municipal house-owning, except in very special circumstances. The competition of municipalities with private builders, the Professor considers, would tend to positive diminution in the supply of houses and a consequent general rise in rents. Moreover, the supply of houses to the poorer classes under the market rate the Professor considers to have all the objections of a rate in aid of wages with a tendency to lower wages. The only legitimate field for municipal house-owning, it appears from the Professor's address, is the re-housing of certain classes of the community who have been allowed to live in slums through the neglect of the municipalities themselves, and who are willing to submit to certain restrictions with a view to improving their social status. There are interesting observations on the productive value of healthy houses with reference to wage-earning capacity and consequent ability to pay high rents, and we commend the whole of this address to those municipalities

who are engaging in somewhat reckless re-housing schemes with small regard to the value of the sites thus occupied and the other economic conditions which appear to have received such careful consideration in Glasgow.

Coal Production. THE annual statistical tables concerning coal production, of which the latest has just been published, contain figures of considerable interest. The total known coal production of the world now is estimated at 790 million tons. In 1901 it was estimated at 700 million tons. Of this 230,334,000 tons have been produced in the United Kingdom, representing 5½ tons per head of the population. The largest coal production seems to be that of the United States—320,983,000 tons of the same denomination (2,240 lb.) as ours, but representing less than 4 tons per head of the population. The average value of the coal in this country was 7s. 8d. per ton, being about the same as in the year 1899. In 1900 it stood at the high average of 10s. 9½d. In the United States, comparing the same dates, however, the average price of coal has risen from 5s. 3½d. in 1900 to 6s. 6½d. in 1903. The exports from the United Kingdom show a considerable increase despite the coal duty, being now 63,804,000 as compared with 58,405,000 in 1901. In the same period the export from the United States seems to have remained stationary at about 8 millions, but it is important to observe that the import into the United Kingdom is but 3,000 tons, leaving the excess of exports 63,802,000; whereas the import into the United States is 3,350,000 tons, leaving their export only 4,954,000 tons. In the above figures, however, the bunker coal of ships in foreign trade is included in the United Kingdom, but not in the figures for the United States. The whole report contains much most interesting statistical information.

Reading-room. CONSIDERABLE dissatisfaction is expressed with the New Buildings, British Museum, decision of the authorities to close the reading-room during the winter and spring months at 7 p.m. instead of, as has been hitherto customary, at 8 p.m. During the summer months the reading-room is closed at 7 p.m. The new regulation, which practically dismisses readers at 6.45 p.m. throughout the year, affects, besides the regular readers, a numerous class who, whilst pursuing their ordinary vocation or business during the day-time, have been enabled to avail themselves of the valuable privilege of visiting the reading-room for an hour or so in the evening for purposes of study or reference. We think, too, that if a similar concession were accorded to frequenters of the Prints and Drawings department, which is now closed at 5 p.m., the increased facility would be greatly appreciated. The demolition is in progress of the houses on the south side of Montague-place for an extension of the Museum on the northern side of the old reading-room, by the erection of a building that will form an annexe to the library and to the exhibition galleries. The frontage in Montague-place will, for the present, be 380 ft. in length; the

complete scheme, prepared in the Office of Works, comprises two corner extensions or wings, and eventually the whole area between Montague-street and Bedford-square, as acquired from the Duke of Bedford, will be covered. The new block, to be erected in harmony with Sir Robert Smirke's general scheme, is to contain five stories, consisting of a basement for storage, a sub-ground floor for storage and for receiving and packing rooms, a ground floor of galleries, with a mezzanine for use of students and for general purposes, and an upper floor to be devoted to galleries and additional rooms for students. The initial plans were made at the Office of Works in the course of last year. Subsequently a group of names of architects was submitted by the Institute to the authorities, who have chosen from that list Mr. J. J. Burnet, of Glasgow, as architect for the buildings in Montague-place.

The Execution of Architectural Design. A PAPER upon this subject in the July and August numbers of the *Journal of the Franklin Institute* will probably interest our readers. As the author himself suggests, the title might be more appropriate if changed to "The Carrying Out of Architectural Purpose," although in the sense implied in his paper the "purpose" may be originally conceived by someone who is not necessarily an architect. In the second part of this paper the author deals at some length with the difficulties attending the selection of a contractor, who, as the active worker, always dominates the contract for good or ill. The problem is far more difficult in the present day, when sub-letting is general in the case of all important works. It appears that in the United States there have been signs of late in favour of a new method of dealing with large contracts—that is, for the architect to take the place of the general contractor, and so to deal directly with the various firms who carry out the work. Something may be said for direct control of this kind, but we are sure that it should not be assumed by the architect if he is to preserve that independent and disinterested position which is so desirable in the interests of clients and of the profession generally. The paper to which we refer is too long for detailed notice, but it contains many points that are worthy of consideration.

New Process for Fireproofing Wood. A SYSTEM for rendering timber fire-resistant has recently been awarded the Elliott Cresson medal by the Franklin Institute, in consideration of the fact that the invention presents a signal and most notable advance on previously-used methods. The most prominent features of the apparatus adopted by the inventor relate to the means of closing the end of the impregnating cylinder and of filling this vessel with liquid under pressure. The disadvantage of the usual form of hinged door is that it prevents the attainment of sufficient pressure for the thorough impregnation of the wood. In the new apparatus this objection is avoided by means of an internally-seated gate, or valve, operated

by hydraulic power, making it practicable to obtain pressures of from 400 lb. to 1,500 lb. per square inch. Again, it is usual to fill the cylinders by high-pressure pumps, the shock caused by which tends to injure the fibre of the timber, particularly at the higher pressures. In the apparatus now under notice an accumulator is used, designed so that it not only maintains a uniform pressure, but serves as a cushion for the pumps and as an indicator for determining the saturation point. In the report published by the Franklin Institute it is stated that by this process a saturation ranging from 25 to 100 per cent. can be secured without apparent detriment to the physical qualities of the wood, and that timber properly impregnated with sulphate of aluminium by the process will resist the point of a Bunsen burner for over eighteen hours—a very much longer time than wood treated by other processes. In our opinion, the great merit of the method is to be found in the mechanical details, which are clearly calculated to facilitate the rapid, thorough, and safe impregnation of the timber for treatment.

The Morris Canal, New Jersey. ONE of the most famous engineering works in the United States is the Morris Canal, constructed about the year 1825, between Phillipsburg on the Delaware River and Jersey City, a distance of rather more than 100 miles. Upwards of thirty-three years ago the canal was leased to the Lehigh Valley Railroad Company, and, in consequence of increasing competition from railways, which in America accept freight at lower rates than do canals, the waterway has been very little used of late. At the present time, in addition to being in a bad state of repair, the canal is an obstacle to much-needed public improvements, and has been condemned in the report of an expert commission. Owing to the growth of vested interests in the United States, it appears that the abandonment of the canal will cause far more trouble and delay than its original construction.

"American Sewer Design and Construction." A PAPER with this title was read by Mr. J. S. Hodgson at the annual meeting of the Incorporated Association of Municipal and County Engineers. It deals almost exclusively with the main drainage works at Boston, Massachusetts, and although in the main English engineers have little to learn from it, there are two or three points which are worthy of notice. One of these is the importance now attached in America to the entire separation of the rainfall from the sewage, although this separation is not completely effected in Boston. The reduction in the size of sewers, which follows from the adoption of the separate system, is of course an important consideration; in the drainage designed by American engineers for the city of Havana in 1900, out of a total of 12½ miles of sewers, 89 miles were only 8 in. in diameter. Another point worthy of mention is that the main drainage of Boston and the surrounding towns was undertaken by the State of Massachusetts. This is a method which might with advantage be adopted by some of our

county councils for congested areas, the cost being apportioned between the various districts in which the sewers are laid.

In one important respect the Hudson River tunnel, through which the Pennsylvania Railroad will ultimately pass, differs essentially from those hitherto adopted. The cast-iron rings are to be built up of segments in the usual manner, but at intervals of 15 ft. cylindrical piles will pass through the bottom with a sliding watertight fit, and upon the piles will be supported beams and stringers, together with the rails and ties of the permanent way. As the piles are to be taken down to solid rock or driven to a satisfactory bearing, the permanent way will be independent of the cylindrical shell of the tunnel. The load of the moving trains will be borne directly by the stringers and transmitted by them to the piles. Thus the stringers will act as bridges, and the piles as bridge piers, while the tunnel tube will be entirely free from serious shock and vibration. This method of design is rendered necessary by the unstable character of the river mud in which the tunnel is to be constructed, for, although the silt is of sufficient firmness to keep the tunnel itself in perfect alignment, it was thought that if heavy trains were allowed to bear directly upon the shell of the tunnel their weight and impact would in all probability cause settlement and establish bending stresses that would result in fracture and leakage.

LETTER FROM PARIS.

M. CAVEL, the architect to whom was entrusted the difficult task of enlarging the Bourse without detracting from its architectural harmony, has been awarded the Cross of the Legion of Honour; a well-merited recognition for an admirable piece of architectural work, both as regards design and construction.

Paris offers at present a spectacle which recalls the days when Baron Haussmann was proceeding with his task of transforming the city, after a somewhat too drastic fashion, into its modern aspect. There is not one of the arrondissements which is not at present, at some point or another, turned inside out by the bands of workmen engaged on the Metropolitan railways. But this upheaval of streets, which will in the end prove a public advantage, will not last as long as under the rule of the celebrated Prefect of the Second Empire. The work connected with line No. 2, between the Place de l'Étoile and the Place d'Italie, is now far advanced, but the opening of the line depends on the completion of the viaduct at Passy, the metallic portion of which has been pushed out as far as the centre of the larger arm of the Seine. The finish of the upper works of the bridge will take a year more; and by about September 1905 we may expect to see a train service over the viaduct of Passy. This line will be completed by an embankment from the Place d'Italie to the Pont d'Austerlitz, with a bridge over the Seine which will be completed at the same time as that at Passy. On line No. 3, from Concelles to Meulmontant, the intermediate stations are finished, and the line may be expected to be opened in October. But the neighbourhood of Père Lachaise has a very treacherous soil, requiring careful treatment which renders the work very slow. The line No. 4, from the Porte d'Orléans to Clignancourt, is in rapid progress at its two extremities; and the centre portion, which runs under the Seine, will be shortly taken in hand. In another quarter, the line No. 5, from the Strasbourg terminus to the Pont d'Austerlitz, is in progress, and completion is promised in 1906, as also with line No. 6, from the Cours de Vincennes to the Place d'Italie. Line No. 7, from the Palais

Royal to the Place de Danube, will be commenced next year, as also No. 8, from Anteuil to the Place de l'Opéra. For the moment, this assemblage of railway works causes great inconvenience in the streets. Many omnibus lines have had to alter their routes, many streets are altogether blocked, and parts of the city are inaccessible except through sloughs of mud.

Works undertaken from purely archaeological motives are going on in other places. We have already referred to the excavations which the "Vieux Paris" Committee has been carrying on near the Collège de France. In its turn, the Société de la Montagne Sainte-Généviève has made some interesting discoveries at the Place du Panthéon, at the corner of the Rue d'Ulm, on a site on which have been unearthed vases full of Roman coins, as well as gravestones of the XVIIIth century, bearing inscriptions in Hebrew characters—a very rare incident among Parisian antiquities.

At another point, the Municipal Administration of Paris is carrying out an excellent piece of work. The Cour de Carrousel, such a mere desert at present, is to be completely transformed in the portion adjoining the Tuileries garden, which is to be continued as far as the wickets leading from the Rue de Rivoli to the quays, and surrounded by a balustrade with the Arc de Triomphe as its centre. It is to be regretted that, while such an improvement is being carried out, there should be constant complaints of the wanton injury done to the statues in the gardens. It has been hitherto impossible to discover the authors of these acts of vandalism; but the mischief has gone so far that the Municipal Fine Arts Department have thought it well to remove from the "gardens Carpeaux" a fine group of Ugolino and his children, and place it in the Louvre, where it will be secure from such injury as has been done to the marble statues representing "The Nile" and "The Tiber," near the large basin.

At the junction of the Avenue de l'Observatoire and the Rue d'Assas the works have been commenced for the erection of the monument to the memory of Dr. Tarnier. This is the joint design of M. Scellier de Gisors, architect, and M. Denys Puech, sculptor; it consists of a marble with relief (exhibited at the last Salon), surrounded by an architectural setting in a fine and broad style. The monument is to be unveiled at the end of November.

The Académie des Beaux-Arts has agreed to a proposal emanating from M. Bernier, the architect, that the sum of money intended for the Prix de Rome in painting, which was not awarded this year, should be handed over, as a travelling scholarship, to M. Prévost, a pupil in architecture of MM. Guadet and Paulin, who had previously obtained the second Grand Prix in architecture, but is debarred from competing further owing to his being above the limit of age. The proceeding is somewhat irregular, but it is regarded as an opportunity of recognising and rewarding the acknowledged talent of M. Prévost, who has only been put out of court by a formality.

M. Longerey, architect, has received from the Director of the Department of Assistance Publique a commission to erect, on a site of about 4,000 square metres formerly occupied by the prison of La Roquette, a block of building containing furnished apartments for bachelors. The Hôtel will contain 510 living rooms, grouped under fifty sections; and around these will be arranged dining-rooms, reading-rooms, baths, etc., for the whole establishment. M. Longerey obtained a premium in the last competition for "Habitations à bon marché," and this building will in fact be the realisation of his competition design.

In spite of the historical and architectural interest of the Château d'Issy, designed by Pierre Bullet, and in spite of the efforts of the Commission des Monuments Historiques, the maudate for its destruction has been given; it is already in process of demolition, and streets are to be laid out over the fine park designed by Le Nôtre. It is likely to be the same with the domain of the Château des Maisons-Lafitte, the work of Mansart, which is offered for sale.

At the Trianon the balustrade of the attic, with its panels of red marble alternating with the colonnettes supporting the decorative vases and figures of cupids, has had to undergo a thorough repair; it was the part of the work that had suffered most from the effects of time. At both the Trianons the necessary repairs have been carried out under the direction of M. Marcel Lambert, the architect who has also had in hand for the last ten years the restoration

of Versailles, which it is hoped will be completed this year.

M. Marius Vachon has been claiming for Pierre Chambiges the honour—generally attributed to Boccador—of having been the first architect of the Hôtel de Ville. The question was referred to the Municipal Council of Paris, which has decided to place an inscription on a panel on the building, embodying its architectural history. The Société Centrale des Architectes naturally took an interest in the matter, and their President, M. Nénot, has communicated to the Comité des Inscriptions Parisiennes the following suggested text for the inscription, which will probably be adopted:—

"L'HÔTEL DE VILLE
commencé vers 1633, d'après la modèle
de Dominique de Cortone dit "le Boccador"
Re-édifié vers 1635
sur les plans de Pierre Chambiges
Maître des Œuvres de Maçonnerie
de la Ville de Paris
continué et achevé en 1628
par Guillaume Pierre & Auguste Guillain
Maîtres des Œuvres de Maçonnerie
de la Ville de Paris
Agrandi par Godde & Lesueur
Architectes de 1837 à 1848
Incendié en Mai 1871
a été reconstruit par Th. Ballu architecte
en chef et de Perthes architecte
de 1874 à 1882."

THE BRITISH ASSOCIATION MEETING.

BEFORE coming to the presidential address which served to open the proceedings of the Engineering Section of the British Association meeting on August 18, we think it desirable to make some mention of the address delivered by Professor Horace Lamb to Section A. In some respects this constitutes an answer to the questions brought forward by Mr. Balfour, and which were discussed in our issue of last week. Professor Lamb dealt at length with the part played by Professor Stokes in the development of mathematics and physics, and then examined the points of contrast between modern lines of thought and the teachings of the school of which Stokes may be taken as the representative. In the present day it is no longer thought that the world is constructed in accordance with an absolutely geometrical design, and, as Professor Lamb said, "We no longer hope by levers and screws to pluck out the heart of the mystery of the universe." While recognising the fact that the systems of geometry, of mechanics, and even of arithmetic are merely instruments to aid the study of nature, Professor Lamb holds the opinion, with which most of our readers will probably agree, that it would be quite out of the question to relinquish these aids, and to rely upon mere speculation for knowledge as to the essential nature of matter, and the manner in which it is organised in the world we inhabit. To the scientist, as represented by Professor Lamb, the world has become a more wonderful place than ever, that will supply subjects for scientific research for ages to come. Mr. Balfour, who was present during the address, said that it touched questions that were not merely for the professional mathematician, for they cut down to the very roots of those speculations, to which men were being driven, as to the foundations of our knowledge of the natural world.

The address of Mr. C. A. Parsons to the Engineering Section brings us back from empirical spheres of thought to the hard details of daily life. Taking "Invention" as its subject, Mr. Parsons pointed out in his opening remarks that a happy change of feeling towards inventors had been evidenced during the last century. Private individuals had devoted more and more time and money to the work, and scientific associations, municipalities, and Governments had afforded valuable facilities for the purposes of research. Such measures as these have undoubtedly furthered the cause of invention, but they have had an even more important result by influencing the application of scientific methods to engineering practice. We are glad to see that Mr. Parsons took exception to the popular idea that invention is a happy thought occurring to an inventive mind. This erroneous notion, we regret to say, is one that seems to prevail among a certain class of professional inventors who make the way of progress more difficult by hawking impracticable or worthless patents in every likely or unlikely direction. Mr. Parsons told his hearers that almost all important inventions had been the

sult of training, laborious research, and long-continued labour, and that the after perfection of an invention for general use often involved facilities as great and required for its accomplishment as much skill as the invention itself. The truth of these remarks is sufficiently proved by the history of the steam engine, the gas engine, the steamship, the locomotive, the motor-car, and, we may add, of the steam turbine, to the improvement of which Mr. Parsons has devoted the greater part of his life. Proceeding to discuss the question of legislative assistance for the inventor, Mr. Parsons asked whether more could not be done for the protection of patents, and for their assistance when attacking difficult problems. It is certainly the case that the only protection afforded to some valuable inventions is in connexion with details of construction, with the result that those who do most frequently get nothing, some obtain inadequate returns, and only the very few secure satisfactory results. Another point of importance is the absolute difference exhibited by the British Patent Office as to the novelty of inventions submitted. An enormous amount of time, money, and disappointment would be saved if the practice of the Patent Office in this country were assimilated to that adopted in the United States and Germany, where, as Mr. Parsons pointed out, the patent is advised after the lodging of his provisional specification of the chief anticipatory claims, dead or alive. The present state of things is humiliating in the extreme for a nation occupying the position that Great Britain does in the world.

After the presidential address in this section, Mrs. Ayrton, M.L.E.E., the only lady who has been admitted to membership in one of the leading engineering institutions of this country, delivered a lecture on "The Origin of Sand Ripples," a subject which has for a long time been in a state of obscurity. By the aid of diagrams and apparatus, consisting of tanks of water with wind in the bottom, the lecturer showed that the forward and backward movement of water over sand would cause small ridges to become visible on the surface and to increase in height and number as the oscillation continued. The effect appears to be that water flowing immediately over any ridge revolves in a spiral vortex, sweeping the sand back towards the ridge, while the higher water falls down over the vortex and brushes the sand forward away from the ridge, so that at a certain point the sand is being swept in both directions. At this point there is the beginning of a new furrow, while the sand is pushed up by the water flowing obliquely over the vortex forms the nucleus of a new ridge. No inference is to be drawn from the observations of Mrs. Ayrton is that, contrary to accepted opinion, a steady flow of water in one direction cannot produce sand ripples, but will obliterate such previously existing in the sand over which it passes. We ought here to refer to the lecture delivered on the succeeding evening by Professor George Darwin, on "Ripple Marks and Sand Dunes," a subject including that already discussed. The lecturer, as mentioned by Mrs. Ayrton on the previous evening, took the first step some twenty years ago towards the elucidation of the genesis of sand ripples, and his recent lecture explained how ripple marks might be produced in a circular vessel containing water and a layer of sand, the effect being due to eddies in the water. The theory of Professor Darwin is similar to that of Mrs. Ayrton, except that he demands two eddies for the production of a sand ridge, while hers requires but one eddy. The more important part of Professor Darwin's lecture was devoted, however, to the discussion of sand dunes, formed by the eddies in moving air and water. Some of the dunes described and illustrated are waves of inequalities transverse to the wind, and others are longitudinal. The practical utility of this subject is sufficiently obvious, for the protection of cultivated land from the encroachment of sand and the control of drifting snow are matters frequently demanding the attention of agriculturists and others. During the same day the Engineering Section was mainly occupied with the discussion of problems connected with internal-combustion motors. Mr. Dugald Clerk first read a paper entitled "Flame in Internal-Combustion Motors," this being undoubtedly the most important point at present demanding inquiry of those engaged in the design of such engines. As in the James Forrest lecture, reviewed in our columns a few weeks ago, Mr. Clerk invited the aid of the physicist for the accurate determination of flame temperatures, an operation of great

difficulty and upon which available data are very incomplete. It is satisfactory news that a committee of the Institution of Civil Engineers has been appointed to consider the whole question of the thermo-dynamic standard for internal-combustion motors, and we join with Mr. Clerk in hoping that the committee will also make it their business to deal with flame temperatures and their determination. Professor Harold Dixon contributed a paper on "Exhaust Gas Calorimetry," dealing with the specific heat of gases at high temperatures, and expressing the opinion that carbonic monoxide could not be consumed at very high temperatures, as dissociation would thereby be effected. During the course of the subsequent discussion Sir Andrew Noble stated that in experiments he had made at high pressures the specific heat of gases had not varied so much as he had expected; but the fact that variation was observed is a confirmation of the German conclusion, expressed by Dr. Schröter, that specific heat depends upon pressure as well as upon temperature.

One of the most interesting papers read at the Monday sitting of the Mathematical and Physical Section was that of Dr. Glazebrook on "The National Physical Laboratory." A valuable work brought to a successful termination in that institution is the construction of a number of mercury standards of resistance. Dr. Glazebrook commented upon the fact that, although the Electrical Standards Committee of the Board of Trade had recommended "that a material standard constructed in solid metal should be adopted as the standard ohm, and should, from time to time, be verified by a column of mercury of known dimensions," the first opportunity for such verification was only afforded ten years later through the instrumentality of the National Physical Laboratory. The announcement was made in the same contribution that the law had been there deduced "that on similar structures the resultant force due to a uniform wind is simply proportional to the square of the linear dimension." The attention of manufacturing engineers was particularly directed to the facilities offered by the laboratory for the solution of problems occurring in everyday work. Some instances of such assistance already afforded were mentioned by Dr. Glazebrook, among these being examination of the causes producing differences in the tensile strength of steel test pieces cut from different parts of a plate, investigation into the effects of violent shear on an iron plate, the experimental explanation of difficulties in making bronze castings, and work in connexion with the photometry of electric lamps. For the purpose of assisting engineers to secure interchangeability in screws, a special lathe has been built under supervision by Messrs. Armstrong, Whitworth, and Co., and this lathe is now installed in a constant-temperature building at the laboratory. Dr. Glazebrook stated in his paper that examination of the screw of this lathe showed that the error nowhere exceeded 0.0001 in. in the 3 ft. of its length. This is a result of which the designers and makers may well be proud. A striking proof of the practical value of the National Physical Laboratory is afforded by the following extract from a German technical publication:—"Our German instrument-making trade has every cause to watch carefully the development of the National Physical Laboratory, and to take timely precautions before the advantage which it has already secured against English competition are too seriously reduced." Sentiments of this kind show at once the keen perception of the intelligent foreigner and the advisability of supporting more liberally the institution under the competent direction of Dr. Glazebrook.

Passing now to the meeting of the Engineering Section on Monday, we find that electricity formed the basis of all the papers and discussions. Mr. A. A. Campbell Swinton first read a contribution on "Electricity from Water Power," a subject which we are glad to see brought into prominence. At the present time it appears that the total capacity of the hydraulic electricity works in Great Britain is not more than 11,906 h.p., of which 7,000 h.p. is represented by the plant of the British Aluminium Company at Foyers, N.B. This installation is now being enlarged, and Mr. Campbell Swinton says that in the course of a month a further output of 2,000 h.p. will become available. A most interesting project now in course of realisation is that of the North Wales Electric Power Company, whose first installation will derive power from Lake Llydaw, on Snowdon. This

lake, receiving water from Lake Glaslyn, has an area of 5½ million sq. ft., and a catchment area of 1½ square miles in one of the most rainy sites in Europe. By the construction of a dam, the surface of the lake will be raised about 20 ft., and water will be drawn through a tunnel 600 ft. in length. The total fall utilised will be over 1,100 ft., and it is estimated that 8,200 h.p. will become available. The same company also propose to establish a similar plant in the Conway valley, with nearly double the horse-power of that on Snowdon. Another extensive scheme, involving about 6,000 h.p., has been projected in connexion with Loch Sloy, between Loch Long and Loch Lomond. The object of this enterprise is to generate and transmit energy at 40,000 volts to the industrial areas along the Leven and the Clyde, including the towns of Dumbarton, Helensburgh, Renton, and Alexandria. The foregoing memoranda serve to indicate that efforts are at last being made to utilise natural sources of power in this country. Mr. Hawksley and General Webber, speaking in the discussion of the paper, were quite right in saying that in Great Britain difficulty may be experienced in securing continuous supplies of water for power purposes, but that is no reason why the best use should not be made of all the suitable sites. Messrs. C. H. Merz and W. McClellan next read a joint paper on "The Use of Electricity on the North-Eastern Railway." The authors gave a useful account of the power station and system adopted in the Newcastle district, and pointed out that the Company, instead of endeavouring to retain the short-distance passenger who is now attracted by electric trams, intend to develop suburban traffic, and to deal as efficiently as possible with inter-urban traffic. As we have remarked on previous occasions, the North-Eastern is one of the most enterprising among British railway companies, and the programme here indicated shows that the conditions that will govern traffic in and around large towns and cities have been intelligently appreciated. The remaining papers brought before the section on Monday need not be specifically mentioned, as they related to special branches of inquiry chiefly interesting to engineers concerned in the design and manufacture of electrical machinery.

On Tuesday, those attending the meeting of the Engineering Section had an opportunity of listening to the views of Sir Hanbury Brown, on "The Control of the Nile." The author is one of the small band of Anglo-Indian irrigation engineers who joined the staff of Sir Colin Scott-Moncrieff in 1884, and has been connected with the Egyptian Irrigation Department until his retirement this year. Egypt owes much to the energy and skill of Sir Hanbury, who was the first engineer to deal effectively with the Nile flood, and who, by the construction of the Delta subsidiary weirs, increased the head of water held up by the barrage from 13 ft. to 20 ft. As a review of the means adopted up to the present date for making Egypt "produce more," the contribution to which we now refer may be studied with advantage by all who are interested in the subject. Comparatively little is said concerning the new projects discussed in our issues of last and this week, apparently because the paper was written before the publication of Sir William Garstin's Report, and for the reason assigned by the author that more detailed consideration of these schemes would extend beyond available limits. Sir Colin Scott-Moncrieff remarked during the discussion that Egypt was really a small country, for the desert on either side of the Nile Valley was no more a part of the land of Egypt than was the surrounding ocean a part of England. The view of Egypt thus presented helps to make clear the extremely remunerative character of irrigation works in that country, and at the same time points to the limited area within which such undertakings are practicable. A somewhat similar branch of engineering was brought before the same sitting by the report of the Mersey Tidal Régime Committee, read by Mr. J. N. Schooldred, the secretary to that body. From analyses prepared by Mr. Edward Roberts, of the Nautical Almanac Office, it appears that the tides at Liverpool have scarcely undergone any change during the past forty years. This conclusion is confirmed by the comparative examination, made by Mr. Schooldred, of the tidal curves themselves for the years 1803, 1893, and 1874. In addition to their general interest, these results ought to be

of value to the port of Liverpool. We come next to a paper having particular bearing upon the practice of our readers. This contribution was one by Mr. J. H. Wicksteed, descriptive of "A Universal Testing Machine of 300 Tons for Full-sized Structural Members." Although it can be scarcely supposed that a machine of this type will be largely used by building contractors, or included among the instruments bought necessary for the equipment of an architect's office, the results obtained by its aid in testing establishments will be available to all. The machine described will admit columns 88 ft. long by 3 ft. 3 in. square in cross section, or beams 20 ft. between supports by 6 ft. 6 in. deep by 3 ft. 3 in. wide. It will shear 8-in. by 2½-in. bars of mild steel, and break steel wire ropes of 3 in. diameter. The apparatus makes autographic stress-strain diagrams for all such tests, and its sensibility, with a pull of 100 tons, is stated to be 1 in 10,000. The desirability of employing a machine for full-sized tests in preference to ordinary loading becomes obvious when it is remembered that the cost of 300 tons of accurate dead-weights would be more than 2,000*l.*, while the cost of applying them would be very heavy. The next paper, by Professor J. O. Arnold, dealt with the fracture of structural steel under alternating stresses. By means of a machine devised by the author, the remarkable fact was elicited that the resistance of structural steel to rupture under rapidly alternating stresses was inversely proportional to the rate of alternation. Another important result of the tests was the observation that one side of the plate became brittle and the other tough under alternating stresses, and the author arrived at the conclusion that, when steel had once acquired distinct brittleness, it could not be restored by heat treatment short of remelting. Mr. R. A. Hadfield afterwards brought forward a paper on the "Production of Magnetic Alloys from Non-Magnetic Metals," exhibiting a sample of an alloy composed of copper, aluminium, and manganese. The author demonstrated the magnetic character of this specimen, much to the surprise of his audience. As an alloy of copper and aluminium is non-magnetic, the contributing cause of the anomalous result mentioned must be manganese. That manganese should have this effect is extremely curious, for it is known that this metal will transform steel from a highly-magnetic to a non-magnetic substance. Another singular circumstance noted was that, while the manganese produced magnetic properties, the characteristic of reversibility appeared to be due to the aluminium. The startling discovery discussed by Mr. Hadfield, and stated by him to be really due to Dr. F. Heusler, adds one more to the many obscure points connected with the magnetisation of metals. After the reading of a note by the same author on the mechanical properties of iron and its alloys at very low temperatures, the business of the Engineering Section was brought to an end.

Speaking generally upon the business of this department of the meeting, we may say that, with the exception of two or three contributions, there was no attempt to present engineering science in a popular form. Although not calculated to interest the general public, this course is in every way commendable as conducing to the objects for which the British Association was founded. The authors of papers, as well as those members who took part in the discussions, devoted their attention to the consideration of practical science, and showed no disposition to be led away into the realms of speculative philosophy so strongly evidenced by Mr. Balfour's address and by the proceedings of more than one section of the recent gathering.

THE ACTION OF LIGHTNING STROKES ON BUILDINGS.*

IN a paper entitled "The Protection of Buildings from Lightning," which was read at the Glasgow meeting of the Association in 1901, the author mentioned the establishment of the Lightning Research Committee, organised jointly by the Royal Institute of British Architects and the Surveyors' Institution, who have since investigated a very large number of occurrences from the reports furnished by their observers. It was decided after the first year to confine the Committee's investigations to buildings which were fitted with conductors,

* A paper, written for the British Association meeting at Cambridge, by Mr. Killingsworth Hedges, M.Inst.C.E., Hon. Secretary Lightning Research Committee, Royal Institute of British Architects.

and, following this course, the reports on about forty protected buildings affected by lightning have been summarised by a sub-committee, and are having the attention of the General Committee, who will in due course issue a report.

The principal causes of the failure of the usual style of lightning rod as fitted on the buildings investigated appear to be due to the following:—(1) Insufficient number of conductor and earth connexions; (2) the absence of any system of connecting the metallic portions of the buildings to the lightning conductor, especially the interconnexion of the finials, rain-water pipes, and gutters. In the author's opinion the frequent damage by side-flash from the conductors might be lessened by running a horizontal conductor along the ridge, or along the parapets of all the roofs, somewhat after the method which is almost universally adopted in Central Europe.

The lightning strokes may be divided into three classes:—(1) Those where the conductor conveyed a portion of the flash to earth, but the side-flash to other unearthened metallic conductors damaged the building; the practice of running the conductor round the projecting masonry, often taking sharp bends, doubtless facilitated the deviation of the current from its direct path to the earth. (2) In several observations a metallic roof of large area received the flash, consequently became highly charged, and the single conductor failed to convey the whole of the stroke, a portion of which took a circuitous path—for instance, through a speaking-tube and an electric bell wire. (3) A flash struck the building at two points simultaneously, a lightning conductor taking one part of the stroke, but damage was caused by the other portion selecting an unprotected part of the roof.

Earth Connexions.—With a few exceptions these had the defect common to nearly all earth-plates which are simply buried in the ground close to the foundations of a building, and owing to drainage soon became dry, consequently are of very high resistance. Architects as a rule object to sufficiently deep holes being made near a structure; consequently the permanently moist ground is not reached. The tubular earth designed by the author does away with this objection, and can be kept moist by leading a small tube to the nearest rain-water pipe.

Interconnexion with the Metal Work of a Building.—Although the utility of the external metal was specially put forward in the report of the Lightning Rod Conference in 1882, their recommendation has been apparently disregarded in all the cases under review. The Cayeish Laboratory (No. 64) stroke, which was fortunately unattended with danger owing to the gas in the gas-pipe which formed the path of the current being turned off, would not have taken this circuitous path had the leaden roof been connected to the conductors which ran down the tower only, also to the rain-water gutters and pipes, which should have been interconnected at the bottom and properly earthed. Again, at Bedford (No. 88) last year, St. Paul's Church was seriously damaged by the flash leaving the single conductor on the tower by the water on the roof and passing thence to earth by means of the rain-water pipes. In this case it is interesting to note that the lead pipes were not fused, but their round section was changed into an oval one; the iron water-pipes were broken. This incident and No. 68 (St. Pancras Church, Euston) show clearly that the damage was due not to direct stroke, but by a portion of the flash leaving the main conductor and taking a circuitous path round the unconnected metal work outside and inside the buildings.

Observation No. 2: Kea Church, Truro.—The copper sheathing of the spire, owing to its great capacity, could not discharge through the one excellent conductor to earth, consequently the flash divided, part going by the conductor and part by the alternative path formed by the copper covering of the spire to a rain-water pipe, thence sparking through a parapet wall to lead flashing down another pipe, and then along a very small copper wire used for training plants, to the main conductor. Similar effects were noted in Steers Lighthouse (No. 54) and Devaar Lighthouse (No. 56), the divided flash in the former leaving the conductor for a telephone wire and in the latter for a speaking-tube. In these observations the conductors may be said to have acted to a certain extent, and if the structures had been entirely unprotected the damage would have been greater,

but by proper attention to the necessities of each case, and increasing the number of the conductors, the risk would probably be nil, as there would be a definite path for the lightning to take.

Quite the most interesting case is that at Possingworth House (No. 67), struck in June and again in August, 1902, although the roof fairly bristled with air terminals, every chimney being protected, mostly with its own conductor and earth connexion. It is probable that on the second occasion the flash divided, one part selecting a chimney stack, which it damaged, bending the air terminal to an angle of 45 deg., while the other, neglecting the many points fell on an unprotected stucco much lower than the chimney and went to earth by the iron frame of a conservatory, showing the unreliability of a number of independent conductors, which should have been interconnected by means of a horizontal wire led along the ridge; this would in all probability prevent any serious damage.

Sir Oliver Lodge has shown by an interesting experiment that a column of hot air is often selected by a flash although a lightning rod may be affixed to the side of the chimney. Most of our large stacks have a band of metal to which the air terminals are fitted, and from these two conductors should be led to earth. The method adopted in Germany appears to be simpler, and consists of a heavy iron frame rising to a sufficient height above the stack, and continued at the apex so as to form an aigrette. That lightning may prefer the smoke issuing from a chimney was shown by the stroke at the East London Waterworks, Sunbury, last year, the flash doing some damage to the capping before it arrived at the standpipe inside, which was a perfect earth in that it was in direct connexion with the company's mains.

The general conclusions arrived at by the author are that there is very little advantage in placing isolated rods on an ordinary building, unless it has a high tower. A church, for instance, with a spire should have at least two conductors from top to earth. Even then, if any other part of the structure happens to be in the path of a discharge from a cloud to the ground, the stroke may disregard the protected towers or spire and fall on the building, choosing some lower point. If the suggestion put forward by Sir Oliver Lodge at the Bath meeting in 1888 were more closely followed, and the conductors so arranged that they form a protective network over all the roofs, a flash would in all probability be received by some portion of the system and pass without harm to the ground by one of the numerous earths to which the network would be connected.

The insurance offices appear to disregard the question of adequate protection, and are quite content if the single conductor which has not prevented serious damage, for instance, to a church is replaced, and, moreover, take no steps to have the earth connexion tested periodically; also the few unconnected lightning rods erected on our national museums, picture galleries, and other public buildings contrast most unfavourably with the more scientific methods adopted on the Continent, more especially in Germany, where in some districts the local authorities have issued rules as to the erection and testing of lightning conductors, to which the various public bodies have to conform, and in some cities householders are subject to penalties if the system is allowed to get out of order.

TIDESWELL CHURCH RESTORATION.—One of the most important undertakings in connexion with the restoration of the ancient church at Tidswell has just been carried out—viz., the removal of the modern gallery erected about 1825, and which so disfigured the arch, the beautiful transitional window, and the groined arch, are now once more revealed to view. The work of removal of the gallery and north porches has been voluntarily done. The removal of this gallery has revealed little of interest in the way of antiquity. A "squint," a few feet above the belfry door, has been reopened, and in several places the walls show signs of ancient decoration and inscriptions. Two boards found beneath angels' heads painted thereon. The gallery, for the most part was not of that substantial character as was anticipated, and some of the timber was quite rotten and not removed too soon. The architect for the work is Mr. J. Oldrid Scott, of London. The work of preparing the carved oak porches is being pushed on with—*Derbyshire Advertiser.*

RESERVOIR CONSTRUCTION.*

Storage Reservoirs with Earthen Embankments. (a) The Impervious Core below Ground.—Various types of Construction and their Cost.—This point has been dealt with since concrete is used on more than one occasion recently been declared to be the cheapest type.

Owing to the great uncertainty as to the permeability of the natural strata on the water side of the core and for other reasons, this cannot be designed on rational lines, hence there are numerous types of construction, differing very widely, evolved mostly from the accumulated experiences of various practitioners. It may consist of rubble masonry (a type very little used in this country); cement concrete; lime concrete; clay puddle; or a combination of puddle with concrete or brickwork. When formed of concrete (the concrete, of course, stopping some distance before the surface is reached), the core is, in the majority of cases, about 6 ft. wide till it widens outwards, either by battering or stepping, to receive the superposed puddle core and consists either 5 to 1 cement concrete or 4 to 1 lime concrete with the matrix richer at wet spots. When formed of clay puddle the core has a thickness equal to one-fourth to one-third the depth of water impounded, and reduces downwards rapidly till a minimum width of from 10 to 12 ft. is reached, after which it is parallel. In many cases the puddle rests on a concrete sboec.

Another type of puddle core is protected on its sides and bottom by means of concrete. Besides the above main types of construction there are, of course, numerous minor types. In considering the costs of the various types, it will be assumed that concrete materials and puddle can be obtained at reasonable prices. Assuming a depth of water in reservoir of 70 ft. and a length of trench of 60 ft., the cost per lineal yard of the various types of construction would be approximately as under:—

Table with 3 columns: Description, £, s. d. Includes sections for CEMENT, CONCRETE TYPE; LIME, CONCRETE TYPE; CLAY PUDDLE TYPE (10 ft. trench); CLAY PUDDLE TYPE, WITH CONCRETE SHOED; and COMBINATION TYPE OR PUDDLE SANDWICHED BETWEEN CONCRETE.

From the above it will be seen that under no ordinary circumstances can the "concrete" type be cheaper than the "puddle" type. There can be little doubt, however, as to the superiority of the "concrete" type, but numerous failures emphasize the absolute necessity for the employment of the highest qualities of materials, firmmanship, and supervision in its construction, and in the case of direct labour the supervision should be more efficient than if the work were contracted for. Unless the above conditions can be absolutely guaranteed, clay puddle forms by far the safest filling for the reservoir.

(b) The enormous depths to which some reservoir trenches have recently been sunk, and a paper by Mr. G. Mitchell prepared to be read at the Annual Meeting of the Incorporated Association of Municipal and County Engineers, held at Shrewsbury, 14, 15, and 16. These costs are to be taken as applying to no particular locality but as rough general averages for comparative purposes.

the element of uncertainty as to their efficiency even after these great depths have been reached, especially in twisted strata, have led the author to consider whether the reservoirs could not have been constructed more economically and efficiently by methods not involving trench sinking. Several such cases have been investigated following the method adopted in tightening the Randymere Reservoir, Whitby, and the author found that after making large allowances for contingencies this method of construction came out much cheaper than any other.

The following are some of the advantages possessed by this method, viz. :—

- 1. The embankments do not require any fine selected material, in fact, the stonier they are the better, and therefore are very cheap to construct; moreover, as the inner slope is not saturated with water, the section of the embankments can be much reduced.
2. The reservoir is much cleaner, and there is no trouble with vegetation on the banks; shallow parts at the upper end can be readily cut off so as to increase the average depth.
3. Reservoirs could be constructed irrespective of the geological strata. Thus many favourable sites for reservoirs could be utilised where it would be hopeless to attempt to make reservoirs in the ordinary way.

In too many cases the location of reservoir embankments is determined entirely from surface indications, the underlying strata being guessed at from the small portions of consolidated strata withdrawn from boreholes of small diameter, the engineer trusting to luck to find a decent bottom at a reasonable depth. Trial shaft sinking (by which alone a sound judgment can be made) is frequently postponed till the water authority is committed to a contract and as a fresh site means a fresh Act of Parliament, the site is adhered to, no matter what the final cost of the structure may be. The author believes that in such cases the above method of construction will often well repay investigation.

(c) Position of Valve Shaft.—The valve shaft is frequently built almost entirely exposed, but for economy with equal efficiency it should undoubtedly be placed entirely in the solid ground for the following among other reasons, viz. :—

If exposed, it means that the shaft is usually an ornamental octagonal tower of masonry, and in order to secure water-tightness under the extremes of temperature, the shaft must be lined with cast-iron cylinders; a long foot-bridge is also necessary as an approach. There have also been cases of the valve tower being injured by movement of the earthwork of the embankment. All the above contribute to render an exposed valve shaft very expensive, and it possesses no advantage whatever over a shaft built entirely in the solid. The valve shaft should be built immediately on the water side of the impervious core of the embankment; a little scheming will generally determine suitable positions for the various draw-off pipes without much disturbance of the natural strata.

(d) The great variation in the top width of puddle walls calls for comment. The top width in many of the older reservoirs was only 4 ft., while during the last ten years in deep reservoirs where first-class puddle and backing have been used, the top width has varied from 6 to 14 ft.—the latter being surely very extravagant. The amount of cover given to the puddle wall is also most important. In many large reservoirs it is as small as 14 in., which is far too small considering the great danger of the puddle wall cracking, and the comparatively trifling expense of adding a foot or two to the height of the embankment.

So great is the danger should a drought be succeeded by a very heavy flood, as happened in the north of England a few years ago, that the author believes it would be worth while to have a pipe laid across every important embankment, so that the roadway might be kept moist in dry weather, and so keep the top of the puddle wall in good condition. The cost of this in most cases would be infinitesimal, as springs can be caught on the higher ground near most embankments. The same idea could be applied to masonry dams where so severe stresses are developed in the masonry by changes of temperature. A stream of water could be kept flowing continually over all exposed masonry. The water thus flowing out of the reservoir would not be wasted, as it would form part of the compensation water.

(e) Within the last nine years there have been constructed three reservoirs at the terminations of three of the largest aqueducts of this country, the capacities varying from 700 to 120 million gallons. The types of construction are: (1) earthen reservoir, with puddle wall, lined on embankments only; (2) concrete reservoir, with vertical retaining walls and brick and asphalt lining; (3) earthen reservoir, with puddle wall, completely lined with concrete and pitching.

Considering that all three waters are practically identical in character, it seems strange, in view of the enormous economies possible by the adoption of the first type, that the other two types should have been used, particularly the second, the author not being aware that there is any advantage in vertical walls. Doubtless "circumstances alter cases," but there is a limit to the application of even that truism.

(f) Till recently the author was led to believe that the advantage of numerous decanting pipes in deep reservoirs was universally admitted, but having occasion to visit a deep reservoir under construction he found that the whole of the water was intended to be withdrawn from near the bottom, and he would be glad to hear this point discussed.

Service Reservoirs.

(a) Circulation of the Water.—Too little attention seems to be given to the prevention of stagnation of the water in service reservoirs in this country; on the other hand, some foreign engineers seem to have gone to the other extreme.

In some cases for the sole object of cramming all the valves together, the inlet and outlet pipes are within a few inches of each other, with the result that there is no chance of circulation.

Considering the small extra expense involved the inlet and outlet pipes should be so arranged that there is as much circulation as possible. The inlet pipe should discharge well below the surface, and if there are several inlets and outlets they should be spaced well apart and at various levels. Floating outlets are sometimes used in covered service reservoirs, but the author believes that, generally speaking, these are a mistake. Very often the water entering a covered reservoir is slightly warmer than that in the reservoir owing to its passage through a surface condenser or exposure to the air, and hence has an inclination to rise to the surface. The result is, that if a floating outlet is used, the incoming water is skimmed off without mixing with the rest. Generally speaking, unless there is a great deal of suspended matter in the water, floating outlets should not be used, as most service reservoirs are sufficiently shallow to preclude the possibility of the upper part of the water being superior in clearness to the lower part in any perceptible degree.

(b) Ventilation of Reservoirs.—The author believes that in many cases too much ventilation has been provided for covered reservoirs, as there is the chance of objectionable matter being introduced through them. To guard against this, it has been proposed to put some filtering material for the air into the ventilators.

Generally speaking, the capacity of service reservoirs is such that with even the maximum rate of inflow the water level rises very slowly and forces the air very gently through the ventilators, and there is exceedingly little risk of any dangerous uplifting effect on the roof. It hence seems rather absurd to see, as are sometimes seen, as many as thirty ventilators on a small reservoir.

NETHY BRIDGE INSTITUTE, N.B.—The new institute which has just been built at Nethy Bridge was opened recently. The institute contains two recreation-rooms, which can be united in one for meetings, the hall being then capable of seating 250 people. There is also a library and reading-room, etc. The building was designed by Mr. Mackenzie, architect, Edinburgh.

CONGREGATIONAL SCHOOLS, BRIGHTSIDE, SHEFFIELD.—On the 25th ult. the foundation-stones of new Congregational Sunday schools were laid. The site is at the rear of the present chapel and it has been decided to erect a large assembly hall, 50 ft. by 23 ft., with a gallery at one end. There will be eleven smaller rooms, including a library, a young men's room, and young women's room. The other eight rooms will be utilised as classrooms for the scholars. The building is constructed to accommodate 500 persons. Messrs. Henry Boote and Son are the contractors, and Messrs. C. J. Innocent and Son the architects.

JASPER AS A BUILDING STONE.

In the works of classical writers, jasper is described as a translucent stone, generally of an emerald-like green. Most probably the jasper of the ancients included stones now regarded as varieties of chalcedony and agate. But, in addition to the stone intended in the account of that city whose light was said to be "like unto a stone most precious, even like a jasper stone, clear as crystal," there was a variety known as Egyptian jasper, much used in ancient art, and found near the Nile in nodules having bands of red, yellow, or brown. According to modern nomenclature, jasper is an impure form of silicon dioxide, and may be defined as an opaque, close-grained variety of quartz, the colour of which is red, brown, purple, heliotrope, or old gold. The most usual colours are red and brown, the former due to the presence of peroxide of iron and the latter to the same oxide in a hydrated condition. The modern jasper is found on a large scale in the Lake Superior district, and has been known to exist in very considerable quantities in Scotland and North Wales. Practically no use of this beautiful material has been made in decorative and constructional building work, owing to its exceptional hardness, which is quite ten times that of granite, and renders impossible any efficient treatment by the ordinary tools of the stone-cutter.

By means of a newly-patented method, however, it is possible to work the stone without difficulty, and we had an opportunity last week of witnessing some practical tests of the first machine erected in this country for dressing and moulding stone under the system in question. This machine, invented by M. Jaspert, of Paris, has been installed at the works of Messrs. Kirkpatrick Brothers, Trafford Park, Manchester, these works being operated in conjunction with the business of the Jasper Company, of London. The general construction of the machine will readily be understood by the following description. It consists of two parts, the first being a heavy vertical frame resembling that of a drilling or boring machine, and the second includes a horizontal bed like that of an iron turning-lathe, having a reciprocating table upon which the stone is clamped. The vertical frame is fitted with a spindle driven by means of a belt at a speed of 2,000 revolutions per minute, and the lower end of the spindle is screwed for the attachment of an abrasive wheel, composed of corundum and other substances. The wheels can be made of any desired proportions and shape to suit the class of work and the thickness of the slab to be dressed or moulded, and the spindle can be raised or lowered as desired within certain limits. The horizontal bed is fixed in front of the frame carrying the abrasive wheel, so that the reciprocating table, with a movement resembling that of a planing-machine bed, may cause the whole length of the stone to pass in front of the wheel for treatment. For the purpose of adjustment, the upper end of each of the two pedestals supporting the bed is cast in the form of a socket, which is bored out to fit the turned end of a pillar secured to the under-side of the bed. Consequently, the height of the reciprocating table can be raised or lowered to suit the thickness of the stone to be worked. The table has an angular adjustment for chamfering the edges of slabs, and is provided with screw gear very similar to that of a slide rest, so that the stone can be brought up to the abrasive wheel, and drawn away from it when the work has been finished. This transverse movement would enable the attendant to regulate the depth of each cut at will, but, in practice, the cut is automatically regulated, the depth being $\frac{3}{16}$ in. for each longitudinal travel of the table. The forward and backward motion of the table is effected by means of a screw fitted in the horizontal bed and connected with a shaft driven by one of two belts, one open and the other crossed. Reversal of the motion of the table takes place automatically at the end of each stroke, when an arm projecting from the under side of the table comes into contact with a collar attached to a horizontal rod connected with the striking gear of the driving belts. A loose pulley is fitted between the two driving pulleys, but the motion of the travelling table can be instantaneously stopped by a lever, which disengages the nut working along the actuating screw in the bed. It will be seen from this description that after the slab of stone has been correctly placed in position, the whole of the

operations are automatically conducted. The only work left for the attendant is to look on and at the proper time to stop the machine, when the moulded slab can be taken away.

During our recent visit to Trafford Park, this machine was tested with various kinds of stone, including Portland stone, Carrara marble, Mexican onyx, and red Welsh jasper. The object in each case was to form a 2-in. decorative mould on the face of the slab, and the results are briefly stated below:—

Portland stone.—Length of slab, 5 ft.; speed of travel, 6 ft. per minute; depth of cut, $\frac{1}{16}$ in. Time occupied, 9½ minutes.

Carrara marble.—Length of slab, 18 in.; speed of travel, 6 ft. per minute; depth of cut, $\frac{1}{16}$ in. Time occupied, 6½ minutes.

Mexican onyx.—Length of slab, 3 ft.; speed of travel, 6 ft. per minute; depth of cut, $\frac{1}{16}$ in. Time occupied, 10 minutes.

Red Welsh jasper.—Length of slab, 2 ft. 6 in.; speed of travel, 6 ft. per minute; depth of cut, $\frac{1}{16}$ in. Time occupied, 48 minutes.*

The quality of the work performed is excellent, the surface being geometrically true, and so smoothly finished that no further dressing is requisite beyond the raising of the polish. In the case of the Mexican onyx, the result was particularly satisfactory, especially as this stone invariably presents flaws, which constitute a serious obstacle to shaping by hand tools. As may be expected, the working of hard stones must cause a certain amount of wear on the periphery of the cutting wheel, but in the ordinary way the only evidence of this is a slight reduction of diameter in course of time. If, however, the shape of the mould becomes altered owing to the presence of exceptionally hard layers or bands in the stone, the original profile can quickly be restored by re-turning in a lathe. We may here mention that the abrasive wheels are usually supplied by the patentees in cylindrical form, the moulds required being cut at the works of the user. The new machine is said to be equally suitable for working granite, the speed of travel for this stone being 3 ft. per minute. It is curious that the speed for jasper (6 ft. per minute) should be the same as that for Portland stone and marble, and it would be interesting to know the reason for this apparently anomalous circumstance. The Jaspert machine is made in various sizes for working table tops, mantel pieces, and small architectural details, and, as in the case of the machine here described, for dealing with slabs weighing several tons.

We are informed that further adaptations of the abrasive compound are contemplated, and that it will be applied to saw blades, rubbing beds, and other stone-working appliances. Jasper is now being quarried on an extensive scale at Aberdaron, not far from Braichy-Pwll, the "Land's End" of North Wales, and it is believed that the further development of the patent to which we have alluded will render generally available a new building stone, combining more beautiful colouring than marble, and possessing greater strength and better weathering qualities than granite.

THE KLEINE FLOOR SYSTEM.

MANY patented systems of floor construction suffer from the drawback that they involve the employment of specially-manufactured sections of steel and of special forms of brick, terra-cotta, or similar materials. When this is the case, the cost of construction is undesirably increased by the conveyance of materials to the site, as well as by the comparatively high prices of special products. The essential features claimed for the type of flooring here described are:—(1) That, as ordinary bricks and simple sections of steel are employed, the cost is reduced to a minimum; (2) that the floor can be built in wide spans without the aid of joists, thus saving their cost; and (3) that it possesses in a marked degree fire-resisting and sound-resisting properties. Although quite new in the United Kingdom, the Kleine floor has been largely used in Germany for the past twelve years, and we are informed that the imperial and municipal authorities have adopted it very extensively in Berlin and elsewhere in Germany.

On Tuesday last we availed ourselves of an opportunity of inspecting the construction of three spans of this flooring, one of 16 ft. and two of 6 ft. 9 in. between supports. The method followed is extremely simple, and, when

the details have once been settled by the architect, any bricklayer can perform all the work required with the greatest ease and rapidity. Let us assume that a floor panel has to be built between two main girders placed 16 ft. apart. In the first place, the lower flange of each girder is enclosed by a strip of expanded steel or galvanised netting. Then a light platform is formed over the area to be covered, for the temporary support of the work, this platform being of boards which need not be nearer to each other than, say, 1½ in., and its upper surface being about an inch lower than the under side of the girders. A course of bricks on edge is then laid in cement mortar between the girders, the two end bricks being roughly rebated, so that the under surface of the course may lie on the supporting platform, and thus project below the level of the flanges of the girders. A strip of steel, say, 2 in. wide by $\frac{1}{2}$ in. thick, is next placed along the side of the course of brickwork upon a layer of mortar that serves to raise it about 1 in. above the board. After this has been done, a second course of bricks on edge is laid, thus enclosing the strip of steel. Two similar courses of brickwork are then laid above the others, but without the addition of the steel bar. Several double courses, the bricks laid flat, with steel bars between the lower courses, are then built and, after them, another series of four courses of bricks on edge as before. The process is continued until the required space is entirely covered. It should be observed that the steel bars are supported on the flanges of the main girders at each end, and that the courses of bricks on edge form stiffening ribs for the floor, the spacing of the ribs being varied according to circumstances. The lower flanges of the main girders are protected by cement mortar plastered into the gap left by the rebated bricks. In the case of short spans, all the courses may be laid flat in the ordinary manner. Another mode of building floors upon the Kleine system is to employ hollow bricks, made similarly to the Hempstead bricks which were recently described in our columns, the advantage there secured being reduction of weight and labour. If made of sufficient depth, a single layer of hollow bricks will suffice for the entire thickness of the floor, thus saving further time in construction. The under surface of the floor can be plastered in the usual way, and the upper surface may be finished with concrete and cement or covered with any suitable material, such as wood-block flooring, terrazzo, or floor boards.

It will readily be understood that examination of constructional details during the progress of work and inquiry into the questions of mechanical strength and physical properties are functions that cannot be performed simultaneously. For this reason, we are unable at the present moment to express any definite opinion as to the strength, fire-resisting, or sound-resisting qualities of the new floor system. We are satisfied, however, that the employment of steel in the manner described will afford considerable resistance to tensile stress in the area below the neutral axis of the construction, and, assuming all details to be properly settled with due regard to the weight to be carried, there is every reason for believing that the claims of the patentee may be fully justified by practical tests. So far as concerns resistance to fire, there is no doubt whatever that any floor built of brick is sure to give satisfactory results. We are informed that a full test of this floor system under heavy loads will be made in the course of a few weeks, and we may, therefore, have occasion to make some further reference to the subject. In conclusion, it should be stated that the inventor claims that his floor can be built so cheaply as to compare favourably in cost with ordinary timber floors, such as are almost invariably found in dwelling-houses. If this claim can be substantiated, there will certainly be great future for the system we have here discussed.

JOINT ISOLATION HOSPITAL, NORMANTON DISTRICT.—Contracts were let on Friday last week by the Hospital Committee for the Normanton and District Joint Isolation Hospital to be built at Featherstone for 13,977. The hospital is intended to serve the districts of Normanton, Castleford, Featherstone, Wetherby, and Altofts, and comprises administration block, laundry, two fever pavilions, a canteen pavilion, an isolation pavilion, porter's lodge, and discharge block, and is for 100 beds. Mr. W. Hamilton Fearnley, Featherstone, is the architect for the work.

* Owing to lack of time, we were only able to be present during the first fifteen minutes of this test.

EXHIBITION OF HANDICRAFTS AT HASLEMERE.

THERE was an interesting exhibition at Haslemere last week, when the six handicraft societies which have in recent years been held there, held their first annual exhibition. The exhibition was interesting from an architect's point of view, for the furniture and work which was shown, as well as for church hangings, pottery, and tiles. Many architects experience the difficulty of getting such embroidery or hangings with any balance of living art about them, or of mixed textiles of any sort that will stand wear and remain permanent in colour. The shop-sold article, both in furniture and weaving, is made by machines human or artificial, with a result that it is almost a universal belief that good and permanent furnishings for our houses cannot now be obtained. The reason, of course, is that no machinery can ever supplant the handicrafts; until that lesson is learnt people will go on spending their money on things that are cheap and fashionable at the time bought, which are in reality dear at any price, because they are both of a fashion and of a craftsmanship that passes away. We do not wish to support those who would show us the stoniest stones of construction and hold them as a type of beauty. Simplicity has its place in art, the humblest object can show an ingenuity of construction or be decorated with the richest forms of decoration so long as it retains those qualities of beauty, fitness or grace that justify its existence; and it is rarely one of the pleasantest duties of an architect to discover individual craftsmen who do what they are about. Architects know a deal about all the trades, but they cannot do everything. In furniture, for instance, knowledge of the nature of different woods is vital to right design, and in weaving and embroidery there are the same kind of technical questions, which no design on drawing-board can take into account. The inference is that, though the architect should control the furnishing and decoration of a house that he has planned, intimate co-operation is necessary to bring it to a successful issue. An exhibition at Haslemere was in this respect an interesting and instructive, and if kept up it has been begun, may do a great deal towards forwarding the interest of handicrafts.

A PROPOSED BRUGES RESTORATION.

OF the old city gates of Bruges still extant, the greatest interest has of late been centred on the Porte d'Ostende, perhaps the least ornate. Many of the Bruges restorations have been based so far on the celebrated plan by Marc Gheeraert, dated 1562, which Mr. Wrale discovered in North Germany some years ago.

Why the Porte d'Ostende rather than any of the others—Maréchalé, Ste. Croix, and de Gand—has been chosen might puzzle architects, for more scope for effect lies in the other interesting gates of the city; but the proposed restoration is owing to the great docks recently made between there and the "Bassin," and the altering of the course of the Canal d'Ostende, and the building of a new "Quartier." Round the base of the old gate, however, so as to still have it surrounded by water, for effect's sake, a "foot-bath" has been formed, with quaint result ("Bain-de-pieds" is the local nickname for the new arrangement).

There are many residents for and against the restoration, and there have been lengthy discussions of a lively nature on the matter, in and outside the Conseil Communal, and much ink and paper has been used between the members of the ruling bodies (Conseil Communal, Conseil Provincial, and the State), all of whom go shares in public matters where financial considerations come in.

By the sketch herewith, from Gheeraert's plan of Bruges, an idea of what the old gate was like in the middle of the XVIIth century may be obtained. What the other side of the gate was like must be left, unfortunately, to the imagination, but the whole effect was undeniably picturesque.

No doubt the foundations of the demolished gates could be found *in situ*, if looked for.
J. A. R.

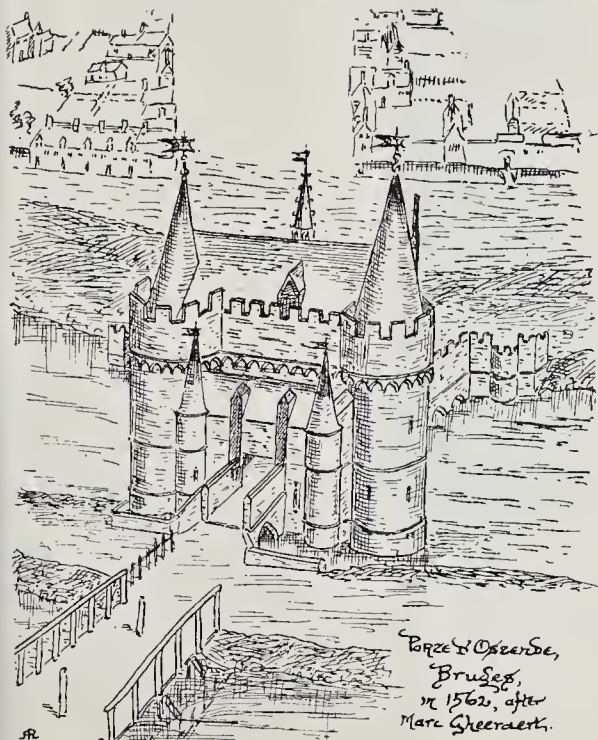
ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION.—We are asked to remind those of our readers who are interested in architectural photography that the photographic competition organised by the Architectural Association Camera and Cycling Club closes on October 1, on or before which date all photographs for the competition must be sent in to Mr. Gilbert H. Lovegrove, the

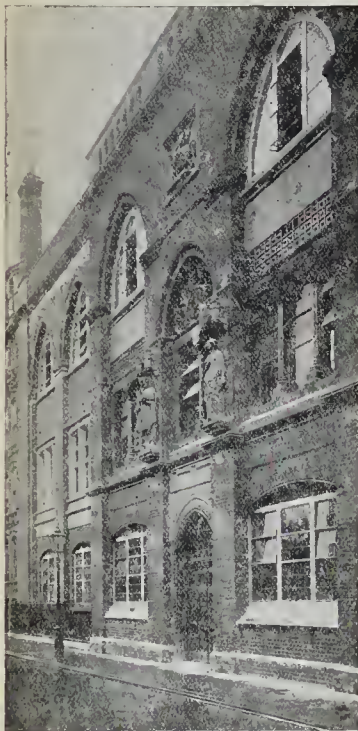
Hon. Secretary of the above-named Club. The competition is confined to sets of photographs adapted for the purpose of architectural study, and is open to members of the Architectural profession, and all members of the Architectural Association. Each set should consist of not more than twelve prints, and should illustrate one subject or class of subjects; but a competitor may submit any number of sets. The photographs will have to be approved by the Committee of the Architectural Association Camera and Cycling Club as having reached a fair standard of technical excellence, and will then be finally adjudged by a gentleman, not a photographer, who is an expert in architectural tuition, and who will be chosen by the President of the Architectural Association. A prize value three guineas will be awarded to the best set of prints, and will take the form of hooks or apparatus.

ARCHAEOLOGICAL SOCIETIES.

BUCKS ARCHAEOLOGICAL SOCIETY.—For the annual excursion of this Society, which took place on August 23, a part of the northern end of the Vale of Aylesbury was selected; and in the course of a long day's touring, many objects of ecclesiastical and domestic interest were seen. It is noteworthy that an unusual consistency was found in the general scale and extent of the churches and in the character of the other buildings visited. After leaving the county town, the party of forty halted at Quarrendon to inspect the ruins of the Chapel of St. Peter, formerly a chapel of ease to the parish church of Aylesbury. Enough remains to tell a sad tale of wilful neglect of a fine mediæval monument; this beautifully-proportioned fabric no longer cries out for authoritative protection, for it is past reclaiming. Various illustrations were produced to prove that in the earlier half of the XIXth century roofs covered the complete structure, but the subsequent destructive agencies of man, he it deplored, and of nature have demolished the larger part of the chapel. There still exists, however, a part of the XIIIth century north arcade and some XVth century insertions in the outer north walls to demonstrate how perfect a specimen of the building arts of the Middle Ages is lost. At Hardwick the church of St. Mary was found to contain much of an attractive nature to archaeologists. The nave arcades suggest a rebuilding of the church in early times, for the arches, caps, and shafts do not in any way harmonise, and the moulded shafts appear to be latest in date of the three features. The decorated south door, the XVIIth century mural monument to Sir Thomas Lec, the active honesty of the tower arch, and the Jacobean communion table were all points claiming special attention. The XIXth century operations here, as indeed in most of the Bucks churches, leave much to be desired, and in all future true restorations the work of that period should invariably be the first to be removed. The church of St. John at Whitechurch proved to be somewhat larger than other examples in the district, and is principally Early English in character. A double piscina and triple sedilia in the chancel are of special interest, but the general effect of the interior is much marred by the unpleasant colour applied to the walls. Two exquisite specimens of Jacobean woodwork are to be seen in the oak halster-almshouse and in the sliding font cover, the latter an adroit arrangement of chains, pulleys, large turned wooden weights, shaped brackets, and turned finials. The mid-day interval with lunch was here entered upon, followed by a business meeting, presided over by Mr. A. L. Liberty, of Great Missenden. An inspection was made of the earthwork marking the site of the castle of Hugh de Bolbec, built about 1145, and which was finally demolished at the close of the Civil War. At Whitechurch several cottages are to be seen of remarkable interest. A late XVIIth century plastered house with brick stables adjoining and the timber-framed schoolhouse with an arched end to the ground story are specially fine. At Oring, the church of All Saints was found to be a very compact and satisfactorily-proportioned fabric, and may be said to have excited the general admiration of the visitors. The main lines of the fabric are XIIIth century work; the north arcade is incomplete, with only one bay, which opens into a very short north aisle. The XVth century oak roofs have unusual struts rising from carved oak corbels, but all the parts are in excellent scale. Perhaps the



Porte d'Ostende,
Bruges,
in 1562, after
Marc Gheeraert.



The Architectural Association Premises, Tufton-street (the Old Architectural Museum Front).

most important church in the neighbourhood is St. Mary's at North Marston, dating principally from the XIVth century. The Perpendicular chancel is said to have been built from the offerings of pilgrims to the shrine of Sir John Schorne, who was Rector from 1290 to 1314; on the north side is a vestry, with watching-chamber above it. The chancel was restored by Queen Victoria in memory of an inhabitant with miserly instincts, who left property to Her Majesty. This work was carried out under the direction of Sir Digby Wyatt, but the value of the interior is destroyed by the crude colouring and design of the reredos and west window. Much of the mediæval work, however, repays careful examination. Granborough Church was the last, and, curiously enough, the least attractive of the very interesting series visited during the day, and it is worth remark that each of the churches possessed a western parapeted tower, amongst other features, similar in design.

THE ARCHITECTURAL ASSOCIATION PREMISES.

We are indebted to the Secretary of the Architectural Association for the loan of these two engravings, illustrating the exterior and one of the interiors of the new home of the Architectural Association. The exterior is, in fact, the old front of the Architectural Museum in Tufton Street, built in the days of the Gothic revival, and familiar to many in a former generation; but, standing as it does in so out-of-the-way corner of London, it may be worth while to remind our younger readers of the aspect of this monument of the enthusiasm of the Gothic revival. It is likely to be a building better known in the future than it has been in the past, now that it shelters the new life and activity of the large Society which has taken it over.

The other illustration shows the interior of one of the rooms for study.

The interior of the building has been almost entirely remodelled, in a very solid and substantial manner; but there is still much to be done before its final arrangement is reached.



The Architectural Association Premises: Interior of the First Year Room in Day School.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—The present year being the jubilee of the Society, the Council have decided that it shall be celebrated by a conversazione. The date is fixed for November 16, at the Royal United Service Institution, where the Society's ordinary meetings are held. On this occasion the museum of the Institution will be thrown open to members and their friends, including ladies. Invitations to the conversazione, with detailed particulars, will be issued in due course.

to the free library, towards the cost of which Mr. Carnegie has given 10,000*l.* On the first floor is a secondary school and the top floor devoted to art. The large north windows of the art school governed the design, producing a somewhat novel combination.

The contract now completed by Mr. F. O. Minter is for 34,730*l.* Mr. Hindson was the first clerk of works and Mr. Hanley the second. The finishing to the basement remains to be done, and the fire station, at the back, to be built.

DESIGNS FOR THE DECORATION OF A PUBLIC BUILDING.

THESE are designs made by two students of the Royal College of Art, South Kensington, Mr. W. J. Stamps and Mr. Lancelot Crane.

The students were asked to make a design suitable for a mural decoration for a public building, it being suggested that each should choose a subject connected in some way with the neighbourhood in which he lived or of which he was specially interested.

Mr. Stamps, who lives in an iron-works district, has suitably chosen "The steel hammer." Mr. Lancelot Crane selected the interesting and suggestive subject of the choice of the emblems of the Houses of York and Lancaster; a subject we do not remember to have seen treated in painting before. The conditions of photographic reproduction have reduced the white and red roses of the original, nearly the same tint, so that one point of the illustration has been lost; but the incident does not affect the general design.

Illustrations.

WAR MEMORIAL, HAILEYBURY COLLEGE.



THIS is the design by Mr. Reginald Blomfield for a South African war memorial to be erected at Haileybury College, reproduced from the architect's own free and effective pen-drawing which hung in this year's Royal Academy.

Owing to Mr. Blomfield's absence from town we are unable to give his own description of the design, or of the materials of which it is composed. From the appearance of the drawing it is evidently either stone or marble with bronze decorative additions. The general intent and symbolism of the design are too obvious to need comment.

Mr. Blomfield's thorough acquaintance with Renaissance work has enabled him to reproduce its spirit in the free and sculptural lines of the base or podium which carries the obelisk, while preserving at the same time a certain originality of treatment.

COUNCIL CHAMBER, DEPTFORD TOWN HALL.

THIS room occupies the centre portion of the north front of the building on the first floor. It is 72 ft. long by 33 ft. wide. The dado and furnishings are in fumigated oak and the upper part in plaster.

The sketch is taken from the Public Gallery.

TECHNICAL INSTITUTE, EASTBOURNE.

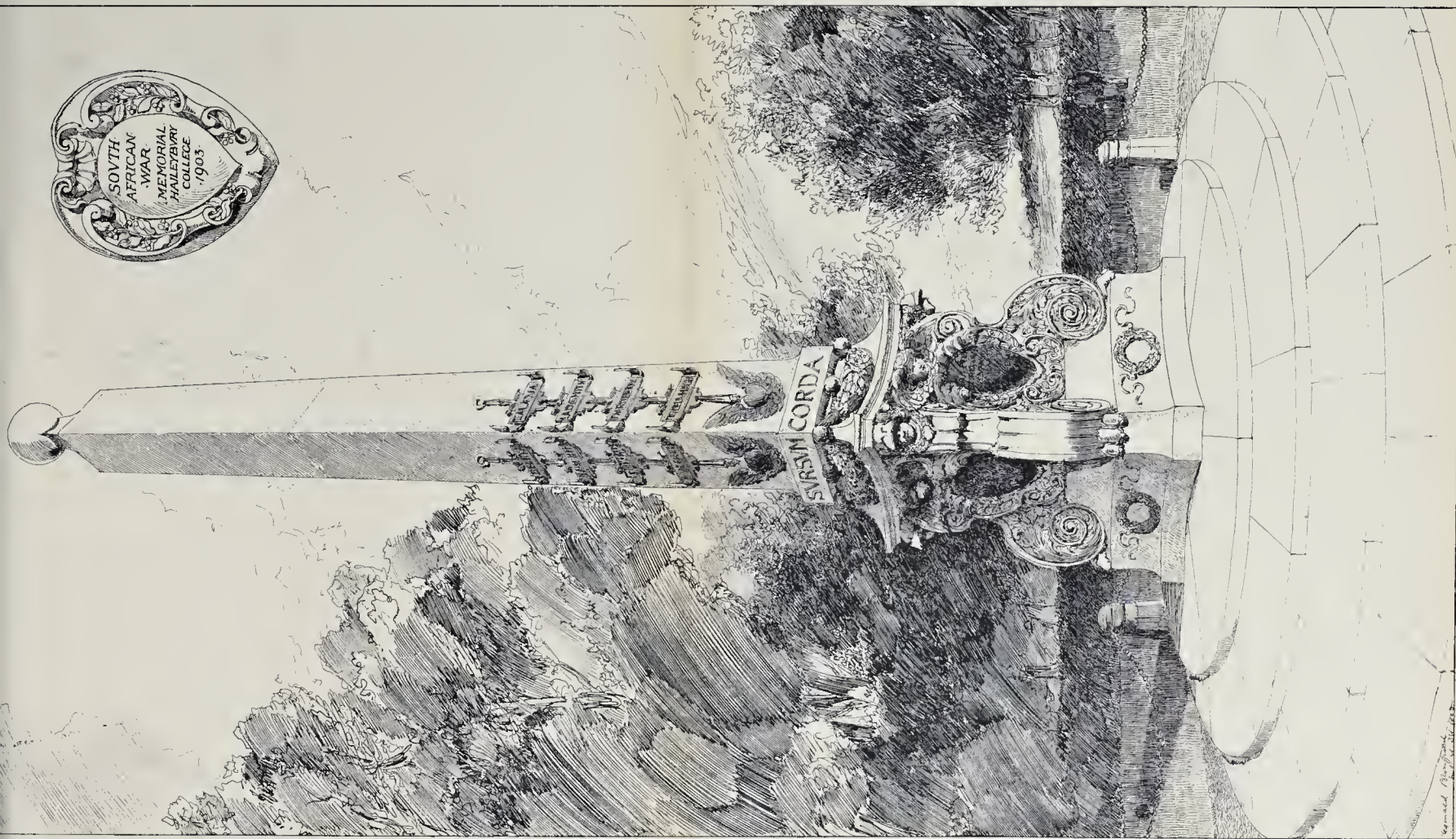
THIS building was opened on August 8 by the Duke and Duchess of Devonshire.

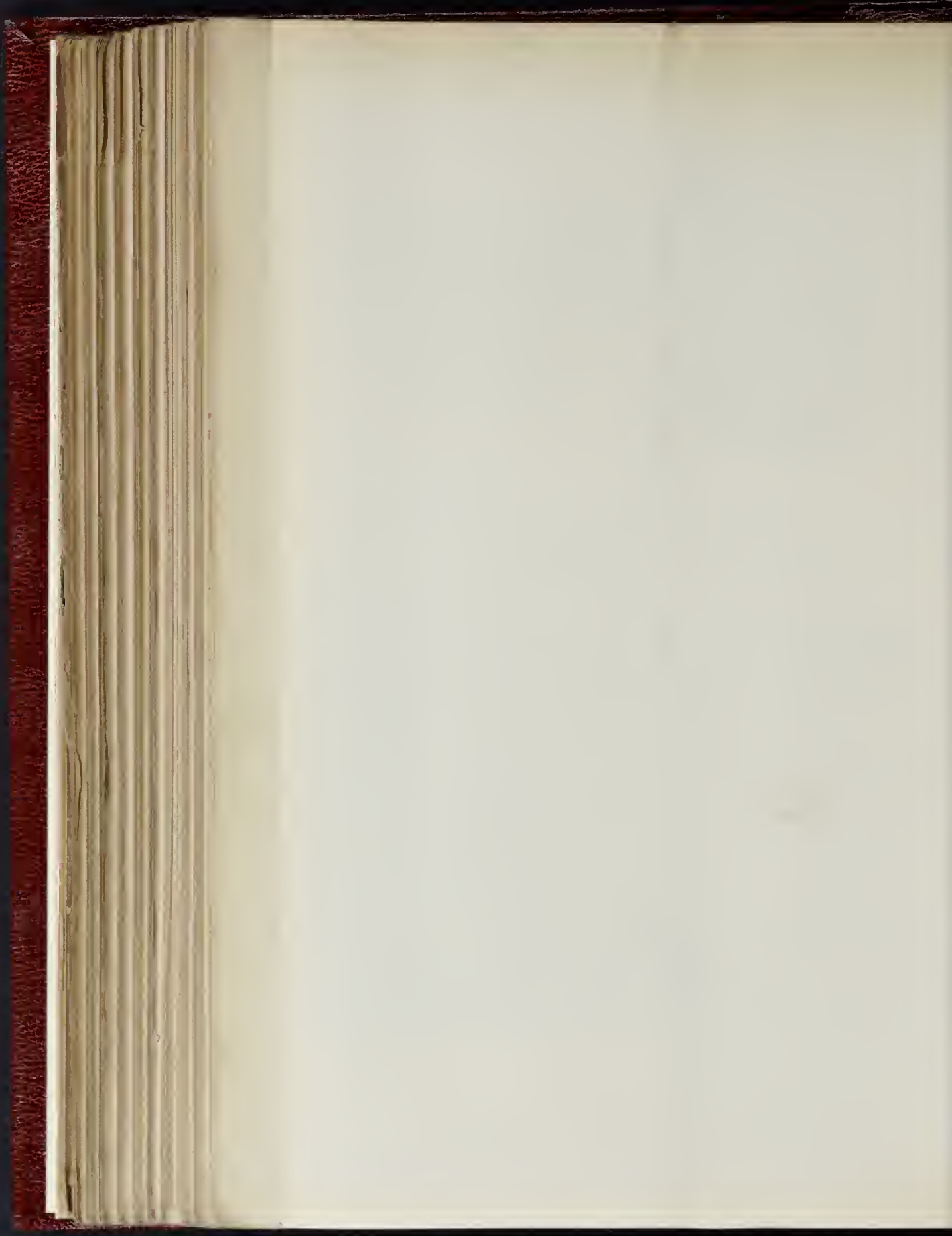
An open competition was held in 1899, and won by Mr. Philip A. Rolson, the late Professor T. Roger Smith being appointed by the then President of the R.I.B.A. to act as assessor.

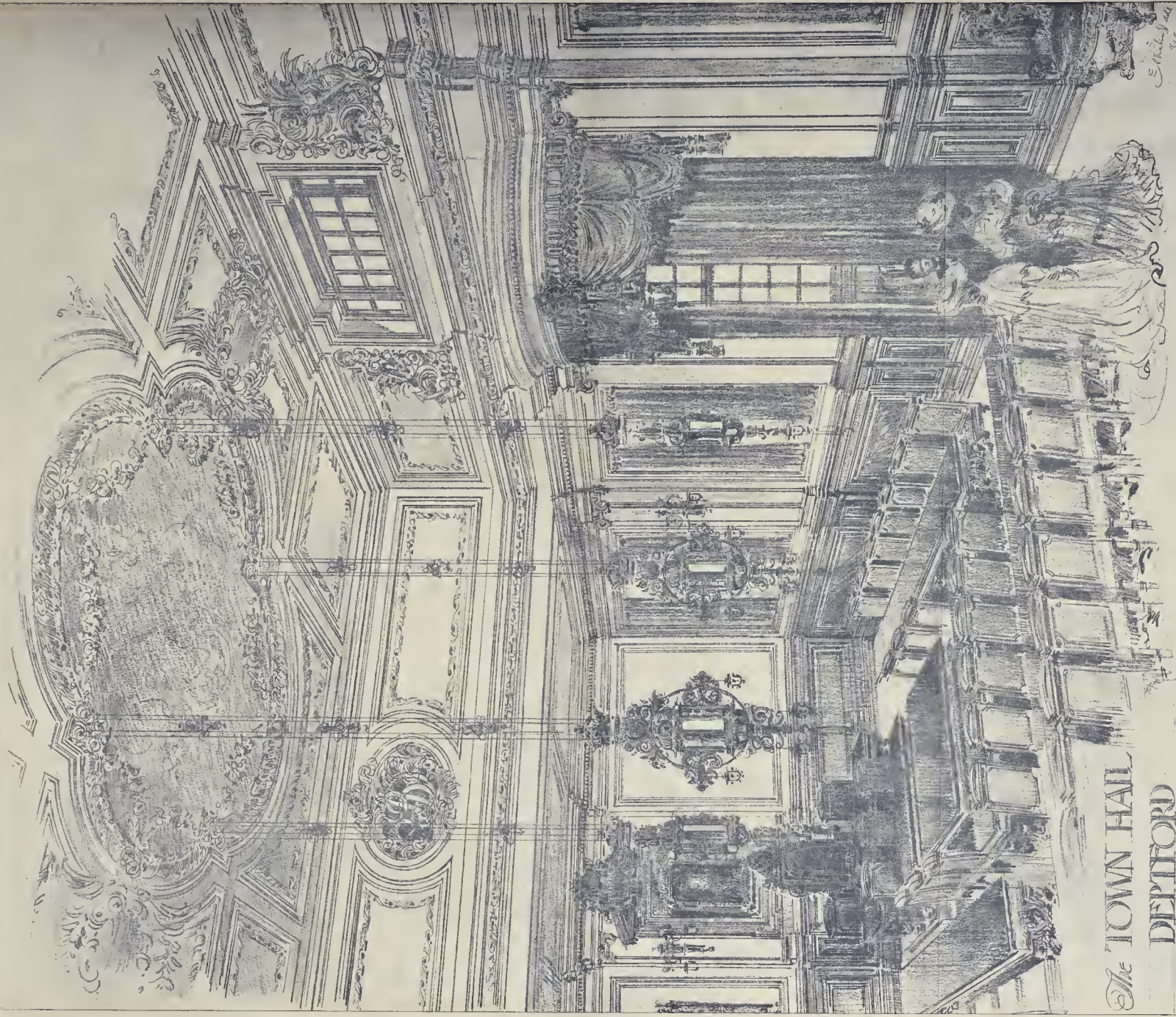
To meet the wishes of the Council, the original design was considerably altered and the cost thereby increased. The main floor is devoted

SCHOOLS, HOLYSTONE, NORTHUMBERLAND.

The new Council schools at Holystone, near Backworth, are one story in height, and consist of two departments—viz., infants and elder scholars. The mixed department comprises a central hall with separate entrance and hat and cloak rooms for boys and girls on the north side, and two classrooms on the east and west sides of the hall. Each classroom contains accommodation for a class of sixty children, while provision is made, by means of movable partitions, for a class of forty-six in the central hall. The infants school is built up against the east wall of the main school, and comprises school-room, 32 ft. by 20 ft., classroom for forty-four, marching corridor, 13 ft. wide, and cloakroom and lavatory accommodation. Covered playsheds at the usual offices are provided on the north side of the playground. The schools are heated with hot water pipes. The elevations are executed in red bricks, and the roofs are slated. The whole of the work has been done by Mr. Nichol Ritchie, contractor, Whitley Bay, from the designs and under the superintendence of Messrs. Oliver, Leeson, and Wood, architects, Newcastle.



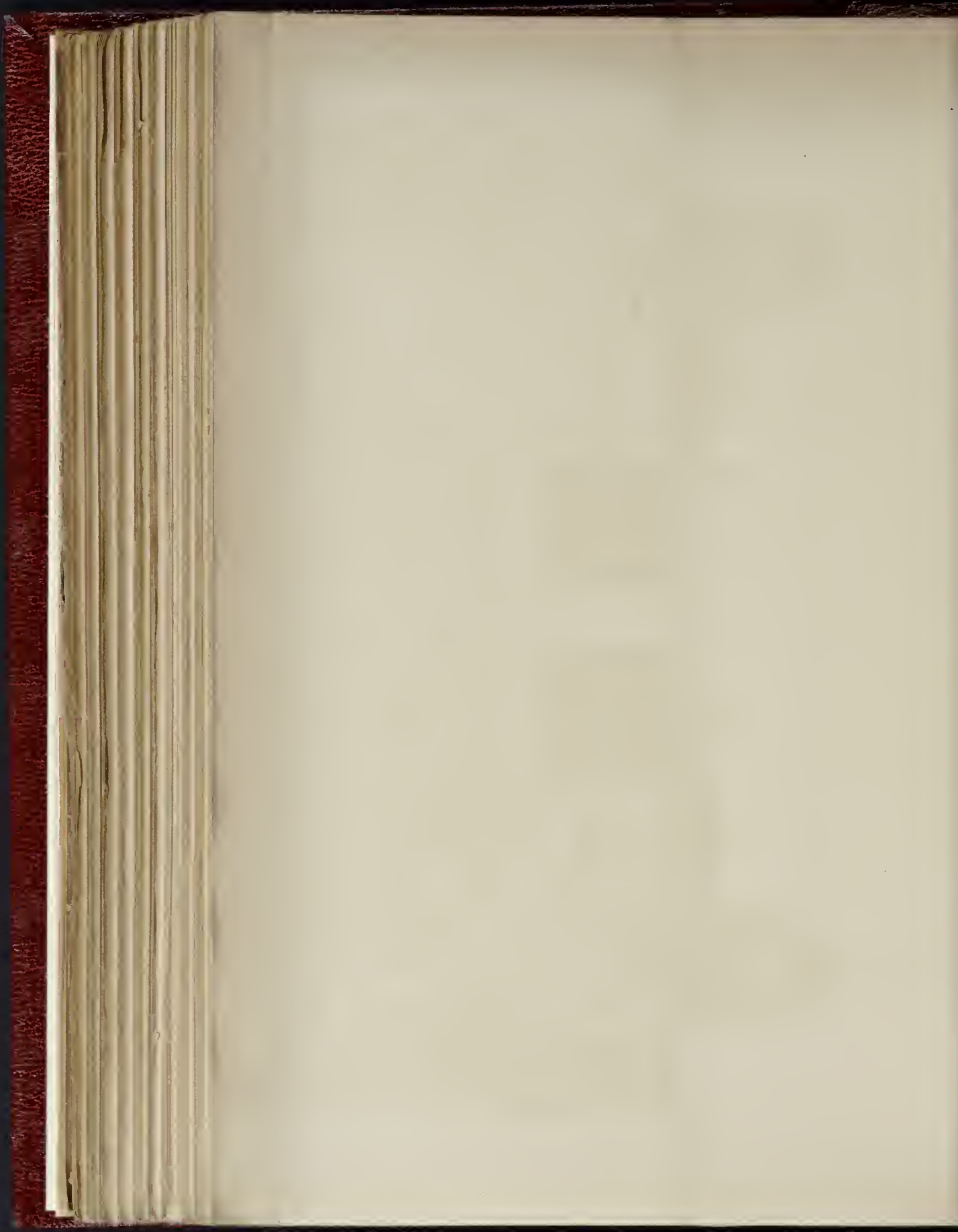


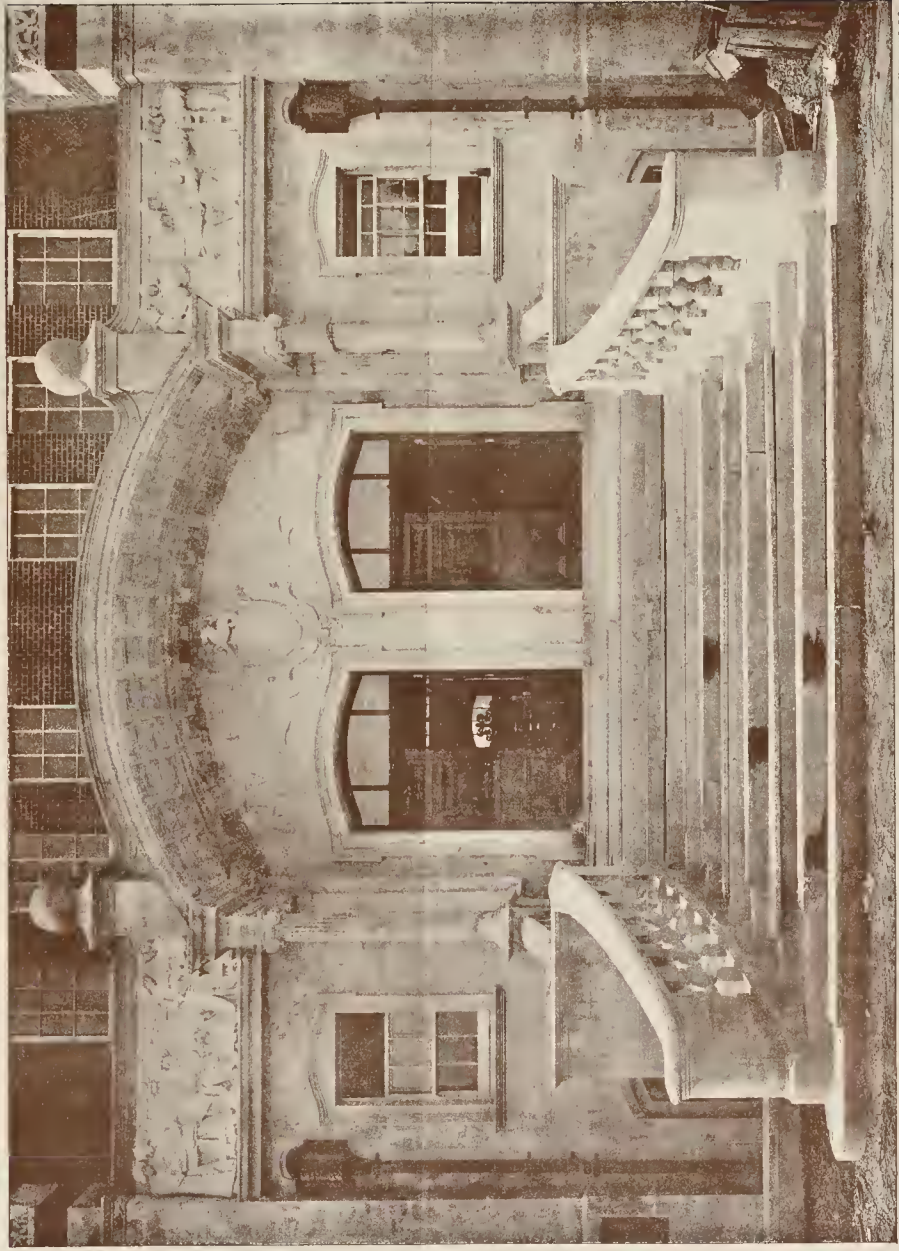
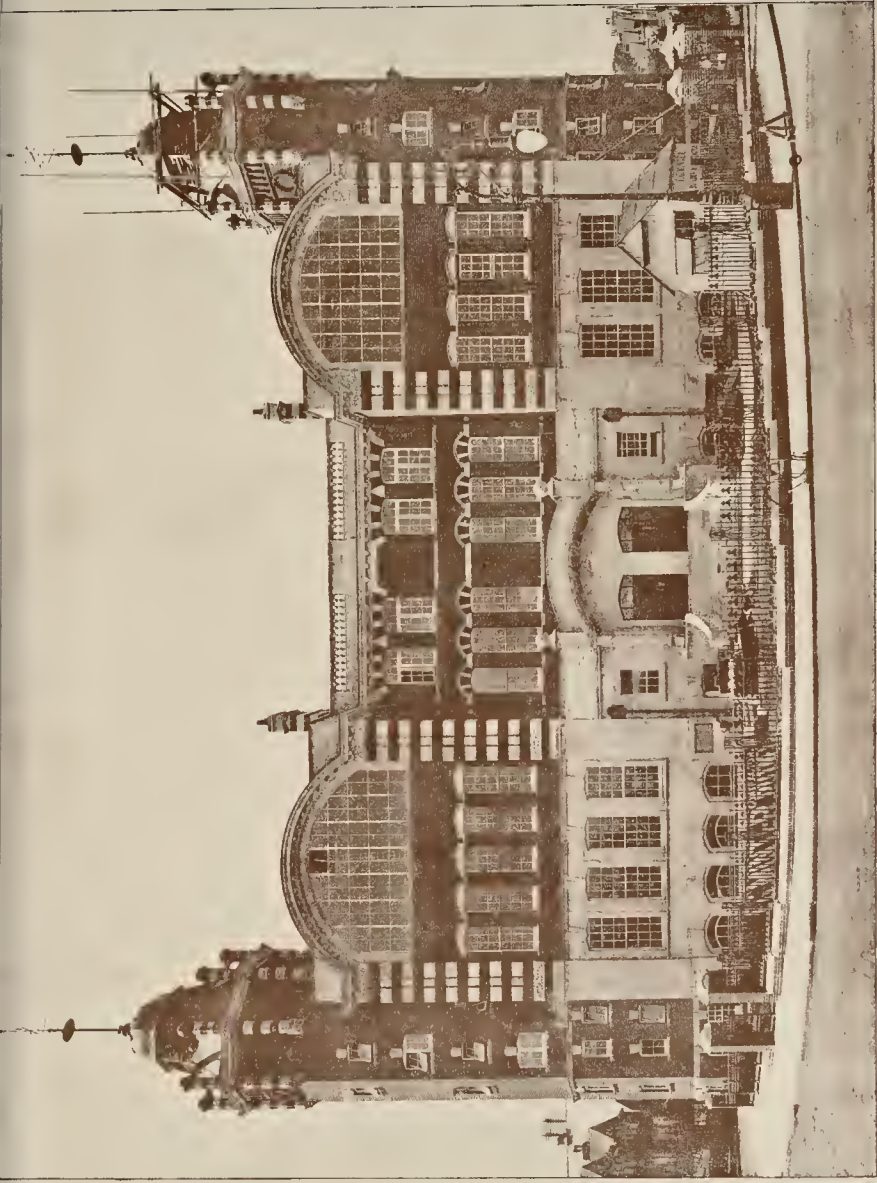


*The TOWN HALL
DEPTFORD*

*View showing interior of
Council Chamber*

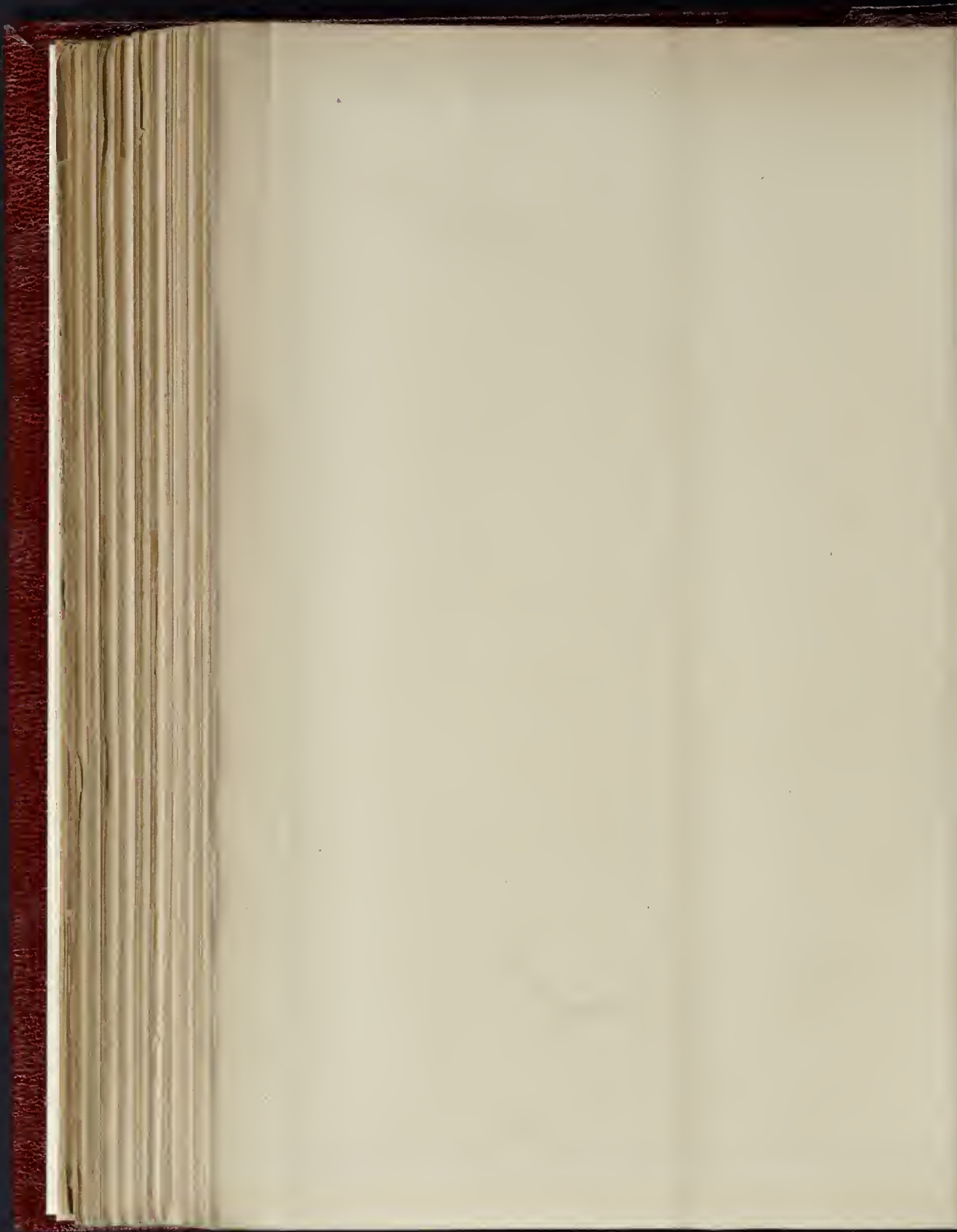
*Tombechester and Roberts
Architects. 1904.*





THE PHOTO. BRADGUE, & CO., 4 & 5 EAST HANOVER STREET, LONDON, E.C.

EASTBOURNE TECHNICAL INSTITUTE.—MR. PHILIP A. ROBSON, A.R.I.B.A., ARCHITECT





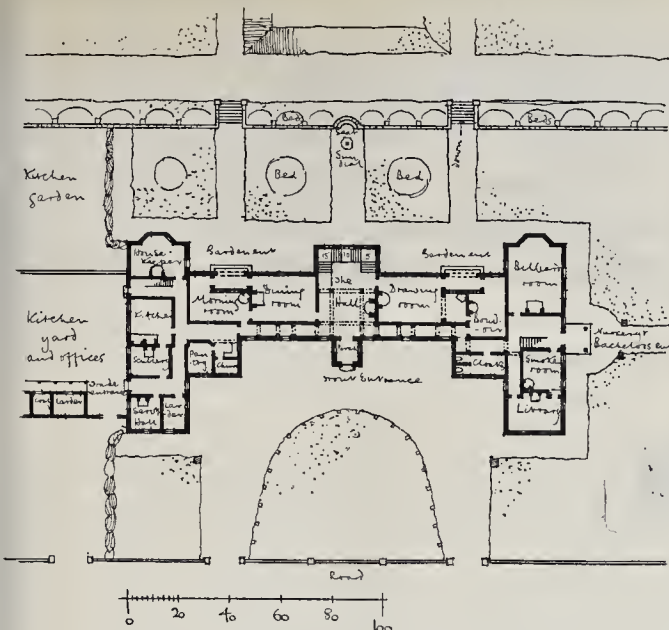
STEAM HAMMER.—BY W. J. STAMPS



THE SELECTION OF THE EMBLEMS BY THE HOUSES OF YORK AND LANCASTER.—BY LANCASTER.—BY LANCASTER CRAN

DESIGNS FOR THE DECORATION OF A PUBLIC BUILDING BY STUDENTS OF THE ROYAL COLLEGE OF ART





Plan of Country House: Mr. C. J. Bathurst, Architect (see last issue).

PLAN OF A COUNTRY HOUSE.

This is the plan of the Country House by Mr. C. J. Bathurst, of which two views were given in the plates in our last issue.

The plan, as will be seen, is rather unusual character; the long corridor is an effective ornamental feature, but the boudoir and the recessed drawing-room seem rather insufficiently lighted, and we notice the often-repeated mistake in house-planning of having a right-hand light on the kitchen fireplace, instead of a left-hand one. There is no compass point; presumably the garden front faces south. It is, however, an interesting attempt at a special character in a house plan.

Books.

Hydraulic Power and Hydraulic Machinery. By Professor Henry Robinson, Professor Emeritus of Civil Engineering, King's College (London), M.I.C.E., M.I.M.E., M.L.E.E., F.S.I., etc. Third edition, revised and enlarged with sixty plates and numerous illustrations. London: Charles Griffin and Co., Ltd. 1904.

Since the modern hydraulic power system was developed some fifty years or more ago by the late Lord Armstrong, its use has been extended in many fields of industry, and during recent years water-power has been employed for many purposes other than those mentioned in the first and second editions of Professor Robinson's well-known handbook. Books written by men who are really proficient in the subjects discussed are always possessed of distinctive value, and in the example now before us an additional feature of interest to be found in the fact that the earliest experiences of the author in hydraulic engineering were obtained when acting as an assistant to Lord (then Sir William) Armstrong. We do not so much as refer to the preliminary discussion of "Discharge Through Orifices," "Flow of Water Through Pipes," and kindred matters, except for the purpose of remarking that due attention is paid to recent investigations embodied in the transactions of the Institution of Civil and Mechanical Engineers and of the American Society of Civil Engineers. These transactions refer chiefly to the importance of the water-mains in an adequate manner, and instances are cited showing the serious diminution of discharging capacity and other desirable results which follow the accumulation of deposits in pipes and the absorption of iron compounds by the water conveyed. The

results of some experiments by Mr. Weston, described in the transactions of the American Society of Civil Engineers, are also quoted showing the effect produced by the sudden closing of valves against water in pipes. In the first series of experiments, the author tells us that water at an average static pressure of 70 lb. per square inch flowed through lengths of pipes thus:—"111 ft. of 6-in. pipe, 53 ft. of 2-in. pipe, and 99 ft. of 1½-in. pipe to a 1-in. outlet pipe, with a ¼-in. orifice. In this case the velocity was 0.15 ft. per second in the 6-in. pipe and 5.30 ft. in the 1-in. pipe. Upon closing the orifice (which was effected in 0.16 of a second) the force of the ram in pounds per square inch was 129.2 lb. in the 1-in. pipe, 127 lb. in the 1½-in. pipe, and 14.5 lb. in the 6-in. pipe." Similar results were obtained in other experiments, some of which showed important reduction of ram force when an air vessel was connected to the pipe system. These tests were a most useful series, and the notes upon them given by the author should be much appreciated by his readers.

After discussing "The Accumulator" and some recent developments of that device, Professor Robinson commences in earnest the detailed consideration of hydraulic machinery as applied in modern engineering practice. We need not traverse the whole of the ground covered by the author, and will confine ourselves to some notes relative to new material introduced in the pages of the present edition of his work. Among hydraulic presses may be mentioned an advantageous type of forging press, in which the application of two cylinders, one near each end, permits the weight and width of the upper framework to be reduced to a minimum. In this press, also, a groove is turned in the mouth of each cylinder to receive the packing leathers, so that the ram, instead of the cylinder, is the surface which works against the packing leather. The advantage of this is that, as the ram is always exposed to view, any scratches can be detected at once, whereas when the packing leather is fixed to the ram any "grooving" that takes place will be on the inside of the cylinder, where it cannot be seen and is always difficult and expensive to rectify. An item of considerable interest is the description of the swing aqueduct by which the Bridgewater Canal passes over the Manchester Ship Canal. Numerous hydraulic lifts of modern construction are noticed in succeeding sections of the book. Among them we may mention the Otis elevator, the Glasgow Harbour elevators, wagon lifts for railway companies, grain conveyors, and the Waygood lift. Professor Robinson also describes the

hydraulic lifts used on the City and South London Railway. These are still retained, but we may remark that in recent extensions of the line electric lifts have been installed. Some excellent views are given of hydraulic hoists and cranes for docks and on board ship; and among recent examples of hydraulic power the author cites the machinery at the Tower Bridge and dock-gate machinery at Liverpool and elsewhere. Those interested in the application of hydraulic power to machine tools will find an account of some appliances of the kind, chiefly hydraulic riveters of various types. Among pumping engines we may specially single out the description of a recent installation carried out by Messrs. Easton and Co. for the Tasmania Gold Mining Company in order to permit water to be pumped from the depth of 918 ft. Another interesting section, devoted to the "Worthington Pumping Engine," describes the characteristics of the recently-installed high duty engines at the East London Waterworks, and includes a summary of some results brought before the Institution of Mechanical Engineers in February, 1903. The use of hydraulic power in tunnelling, hydraulic brakes, hydraulic jets for pile sinking, pump dredgers, hydraulic pile drivers and pile screwing apparatus, hydraulic excavators, water meters, water wheels, and turbines are among the remaining branches of the subject discussed in this most excellent work.

The Application of Electric-Motors to Machine-Driving. By ANDREW STEWART, A.M.I.E.E. Special Edition. London: S. Rentell and Co. 1904.

AS OUR readers are aware, the application of electricity to the transmission of power is no new thing, but the system is not so generally adopted as it ought to be. In large works, where power has to be provided at widely separated points, the employment of electricity provides a simple and effective means of avoiding the losses arising from miles of steam pipes connected with various outlying steam engines, or the excessive consumption of fuel resulting from the use of separate steam boilers in different departments. But in small and compact establishments, where all the machinery to be driven is situated within easy reach of the main engine, it is not so clear that advantage will follow the adoption of electrical driving. Our readers are more or less concerned with the design and management of establishments complying in the main with the two cases mentioned above. Architects have frequently to consider the needs of public institutions where power is required in various buildings scattered over a comparatively large area, while builders and contractors have similarly to apply power for the purpose of erecting such buildings, or for the needs of their own works. Again, the attention of both architects and builders is constantly occupied by the requirements of smaller institutions and commercial establishments where all the machinery is situated near to the source of power. The two points generally considered in connexion with electrical driving are (1), initial cost as compared with the mechanical transmission of power, and (2) economy of working. Some useful information on both these points is contained in the handbook to which we now direct attention, and which also gives particulars of the most approved methods of electrical driving, and of the auxiliary appliances for the control of such systems.

Society of Engineers: Transactions for 1903. London: E. and F. N. Spon, Ltd. 1904.

MOST of the matter in this volume has already been reported in the Press, and the more important papers and discussions have been noticed in our columns. Readers have now an opportunity of studying the various contributions at leisure, in conjunction with the tables and diagrams which are bound with the Transactions. The paper by Mr. Butler on "Certain Vexatious and Fallacious Cement Tests now in Vogue" is of importance as demonstrating the absolute fallacy of the temperature test, a point which is emphasised by tables and a plate including two sets of figures reproduced from photographs. Figs. I. to IV. represent pats of cement which evolved considerable heat during setting, and yet passed every known test for soundness; while Figs. V. to VIII. show pats which evolved no heat during setting, and yet were utterly unsound and

worthless. Architects, as well as engineers, will find useful material in the contribution by Mr. Ernest R. Matthews on "Electric Light Stations, their Design and Arrangement," a paper which deals exclusively with structural work and is illustrated by five folding plates containing plans and sections of buildings suitable for such establishments. Other papers worthy of perusal are those upon "Motor Transport for Goods," by Mr. Douglas Mackenzie, and "Mechanical Stokers for Electricity Generating Stations," by Mr. Albert Gay. The volume concludes with a general index for the period 1857 to 1903.

Sea Coast Erosion and Remedial Works. By T. ALLONSON-WINN, M.Inst.C.E.I. London: St. Bride's Press, Ltd. 1904.

PUBLIC interest in the subject of coast protection is by no means on the decrease, although in many parts of the country the ravages of the sea appear to be regarded with comparative indifference. The pamphlet to which we now refer is reproduced from four consecutive articles which appeared in the pages of our contemporary *Public Works*, and the author, who has devoted much time to the study of marine engineering, propounds a theory which presents a new aspect of the foreshore protection problem, and is worthy of careful consideration. Interest is added to the pamphlet by a series of short notes upon some two dozen coast lines, on most of which the author has been professionally engaged.

Oxted, Limpsfield, and Edenbridge, with their Surroundings. By GORDON HOME. London: The Homeland Association, Ltd. 1904.

AS INDICATED by the title, this addition to the Homeland Handbooks deals with that delightful tract of country so essentially "English" in all its features at the junction of the three counties of Surrey, Kent, and Sussex. Crowhurst Place and church and the fine castle at Hever (now closed, unfortunately, to the public) are included. Lingfield, with its interesting church and village, although but a short distance south of Crowhurst, is omitted; no visitor to this district should, however, miss seeing it. The guide is excellently illustrated with reproductions from photographs and drawings by the author.

Holy Trinity Church, Rothwell, Northants. By H. CAYLEY, M.A., A.R.I.B.A. Kettering: W. E. and J. Goss.

ROTHWELL is perhaps best known for its market house—now repaired and in use; but this pamphlet serves to draw attention also to the very interesting church, and gives a good account of its various architectural features in order of date. The illustrations consist of two full-page photographs and a ground plan. The latter, which has been apparently very carefully measured, would have been of still greater value had it not been reduced quite so much in reproduction. The various dates of the church, so far as they show on the plan, should also have been marked on it; it would have been easier to follow in the letterpress the numerous changes and alterations which this interesting building has undergone.

Single Entry Book-Keeping for Builders. Edited by PAUL N. HASLUCK. London: Cassell and Co., Ltd.

THIS useful little manual is a reprint of a series of articles originally appearing in the *Building World*, and is simple, fairly comprehensive—and cheap. The novice who contemplates opening a set of books, will perhaps be dismayed at the number declared to be necessary. The list is certainly a long one, but, as the business of a builder and contractor is practically a combination of several industries, this is unavoidable. At the close of the book, a chapter (No. IX.) is devoted to a simplified system for small builders; and another to book-keeping for Builders' Foremen, in both of which some very useful hints are given.

The title suggested for one of the books mentioned in Chapter IX. (Invoice Book) clashes with Chapter VI. In the former case the book thus entitled is described as a summary of all bills or accounts sent out, whereas the Invoice Book of Chapter VI. is a record of goods purchased. The alternative title for the last-named, shown at page 8 (Bought Book), appears preferable, and would obviate confusion.

The compiler anticipates "a future" for this

work, and in the copious examples given the year 1909 is employed throughout. Here and there, however, are indications that this date replaces an earlier one. Thus at page 75 occurs January 1, 189-; while at pages 82 and 84 the dates, September 16, 1898, and September 19, 1909, both relate to the same job. The examples themselves are clear and concise, and can be readily followed.

BOOKS RECEIVED.

RESISTENZA DEI MATERIALI E STABILITÀ DELLE COSTRUZIONI. G. Sandrinelli (Milan: Ulrico Hoepli).

LE ABITAZIONI POPOLARI. E. Magrini (Milan: Ulrico Hoepli).

The Student's Column.

NOTES ON PORTLAND CEMENT.

CHAPTER VII.—WEIGHT PER BUSHEL AND SPECIFIC GRAVITY.

THE weight-per-bushel test is a relic of the early days of Portland cement when it was sold by the bushel, and is of no value to the user, as it is chiefly governed by the fineness of grinding and the age of the sample. A cement a year old weighs about 15 per cent. less than when it is new. All that can be said for the test is that it is a rough way for the manufacturer, who knows what his cement of a certain fineness should weigh, to keep a check on his burning.

There are several apparatus for determining the weight per bushel, the object of which all are that the cement shall fall into the measure in a steady, uniform stream from a given height. It is evident that if the cement is shovelled in it will weigh more than when lightly filled.

The best-known apparatus is that designed by the late Sir John Coode. It consists of a hopper carried on a frame, into the apex of which is fitted an elongated cone. The cone is supported by four horizontal pins fixed to the sides of the hopper. The space between the cone and the outlet of the hopper is $\frac{1}{2}$ in. wide, so the cement, which is fed into the hopper, passes therefrom in a steady stream. The top of the bushel measure is 18 in. from the outlet of the hopper, and the cone projects 9 in. below this outlet. When the bushel measure is full, the cement is struck off level with a straight-edge. Of course, it is evident that no jarring of the measure is permissible till after it is filled and struck off level.

The weight per bushel is now being abandoned for the specific gravity test, which is much more reliable and not affected by the fineness of grinding. The age of the sample, however, affects the results, a cement after six months' aeration showing a decrease of from 4.5 to 8 per cent. of its original specific gravity. This is due to the cement taking up moisture and carbonic acid from the air.

Cement being acted on by water it is impossible to estimate the specific gravity in the ordinary way by weighing in water. It is therefore necessary to use a liquid having no action on cement. The most generally used are turpentine and petroleum.

The method used by some operators is to estimate the weight of liquid displaced by a known weight of the cement and calculate the specific gravity of the latter therefrom, an ordinary specific gravity bottle having a perforated stopper and a liquid of known specific gravity being used. The specific gravity is calculated thus:—

$$\text{S.G.} = \frac{\text{Weight of cement} \times \text{S.G. of liquid}}{\text{Weight of liquid displaced.}}$$

One of the oldest apparatus is that devised by Mann (Fig. 1), whose description is as follows:—

It consists of a small glass vessel, holding, when filled to the mark A on the neck, a given quantity of liquid, and of a glass pipette furnished with a graduated stem and stopcock, and containing, when filled to the mark B on its upper extremity, a volume of liquid equal to that held by the first-mentioned vessel minus the quantity displaced by 1,000 grains of the densest substance intended to be examined. In using the gravimeter, the pipette is filled to the mark B with paraffin, turpentine, spirit of wine, or any other liquid which does not act on the cement (preferably paraffin); 1,000 grains of

the cement are then introduced to the smaller vessel, which is placed under the pipette and filled to the mark A. Before this is quite completed the vessel may be corked and the contents shaken to remove any air bubbles that may be entangled in the cement. The height of the column of liquid remaining in the pipette determines the specific gravity, which can be at once read off on the graduated stem.

Schumann's apparatus (Fig. 2), which is in use on the Continent, consists of a graduated tube A ground into a small flask, the graduations being from zero to 40 ccs. divided into tenths of a cubic centimeter. To estimate the specific gravity of cement with this apparatus, the tube is fixed into the neck of the flask, and paraffin introduced until flask and tube are filled to the zero mark; 100 grammes of cement are then introduced down the tube and the reading taken. This gives the volume of liquid displaced by the 100 grammes of cement from which the specific gravity is calculated thus:—

$$\text{S. G.} = \frac{100}{\text{Volume displaced.}}$$

The temperature should be the same at each reading, and for this purpose the apparatus is placed in water of constant temperature.

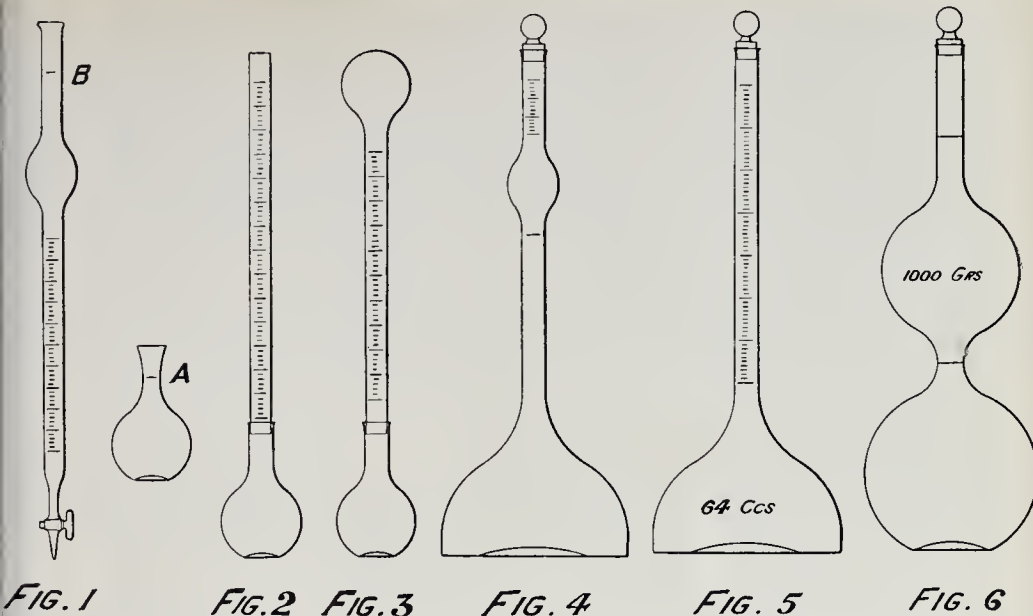
Candlot devised a modification of this apparatus (Fig. 3). It is the same in every respect, only the top of the tube terminates in a bulb. The *modus operandi* is as follows:—A quantity of paraffin is put in the bulb so that when the flask is attached and the apparatus reversed the flask is filled as far as one of the first graduations. The apparatus is again reversed, so that the liquid flows back into the bulb, and 100 grammes of cement are put in the flask. The apparatus is again reversed, the liquid flows back into the flask, and the displacement caused by the cement is read on the graduated tube.

Fig. 4 shows an apparatus designed by Le Chatelier and recommended by the French Commission des Méthodes d'Essai des Matériaux de Construction. It consists of a flask of about 120 ccs. capacity. About half-way up the neck is a bulb of exactly 20 ccs. capacity indicated by marks above and below it. Commencing at the mark above the bulb the neck is graduated from zero to 3 ccs. in tenths of a cubic centimeter. The method of using the apparatus is as follows:—The flask is filled with the necessary liquid to the mark below the bulb; 64 grammes of cement are weighed and introduced to the flask down a funnel until the liquid rises to the zero mark on the neck. The flask is then immersed in water of the same temperature as the liquid, and more cement added, if necessary, to bring the liquid up to the zero mark. The remainder of the cement is then weighed, and the quantity that has been introduced to the flask corresponds with the weight of cement equivalent to 20 ccs. of water. This weight divided by 20 gives the specific gravity.

Keat's specific gravity flask consists of two bulbs, one above the other (Fig. 6) the neck of each being marked. The bottom bulb is of any capacity, but the capacity of the upper one between the two marks is that of 1,000 grains of water at normal temperature. To do an estimation with this apparatus, the lower bulb is filled with the necessary liquid to the mark on the stem, and the weight taken. The cement is then introduced till the liquid rises to the upper mark. The flask is immersed in water of the same temperature as the liquid, and, after allowing time to cool, more cement added, if necessary, to bring the liquid to the upper mark. The weight is again taken. The difference between the first and second weighings gives the weight of a bulk of cement equivalent to 1,000 grains of water, and the specific gravity is this increase, divided by 1,000.

In apparatus like that of Schumann's, the difficulty in getting the cement down the long narrow stem, and in that of Keat's and Le Chatelier's, the cooling of the liquid and adding small quantities of cement to bring the liquid to the required mark, introduce sources of error.

To obviate this a flask was devised by Messrs. Stanger and Blount (Fig. 5). It is practically the same as Le Chatelier's, only the stem is straight and graduated in tenths of a cubic centimeter from the bottom to the top. To the bottom mark the volume is 64 ccs. and to the top mark 67 ccs.; 50 ccs. of liquid are measured into the flask by means of a pipette then 50 grammes of cement gradually added. After bringing to a constant temperature, the



At first sight, it appears a very simple operation to estimate the specific gravity of cement. It is a scientific test, and a very small error in the manipulation will give a result far from correct. If a chemical action is set up between the cement and the liquid employed, wrong result will be obtained.

Of the liquids generally used, turpentine which has been thoroughly dehydrated is the best, but even this liquid after standing for a few days in contact with cement evolves a gas, which can be shaken out by gently tapping the flask. Cement has a still stronger action on turpentine, and with it the cement clogs and closes air, which is difficult to get rid of.

The author knows of one engineer who uses kerosene and petroleum as the liquid. The cement is introduced to the flask, it is allowed to stand for hours, sometimes overnight, for the second weighing. By this time the liquid has swelled through the evolution of gas which is held in the cement. This engineer seldom gets a specific gravity greater than 1.2 and more often under 3.

Xylol is a liquid which has recently come under the author's notice, and gives good results. The cement drops through it without entangling with air, and there is absolutely no action between it and the cement, even after standing overnight. Xylol is very volatile and requires careful handling.

Mann, in describing his apparatus, gives spirit wine as one of the liquids which can be used. At this is worthless in testing cement for specific gravity, as it contains about 15 per cent. water. Whatever liquid is used, it should be absolutely free from water. If necessary hydration by distillation or some chemical absorbent of water must be resorted to.

A point which should be taken into account in determining the specific gravity of cement is the amount of aeration to which it has been subjected. Some operators dry the samples in an air-oven before weighing, to drive off the moisture, but the greater part of the moisture taken up by cement combines chemically with it and can only be driven off at a red heat, and a carbonic acid which is absorbed can only be expelled at a still higher temperature.

All graduated apparatus should be calibrated before use, to make certain the markings are correct. A very small error in the volume of liquid, such as a drop or two, will give a considerable error in the specific gravity. For a number of years the author used a 50-cc. pipette which held 2 to 3 drops in excess, and allowance had to be made for this.

Another point worth noting is that apparatus

which is constantly used for measuring off turpentine should not be left for any considerable time without cleaning, as the turpentine deposits a skin of resin on the glass and so reduces the volume of the measure.

OBITUARY.

MR. ELLISON.—We regret to announce the death, on August 17, at his residence, No. 22, Mannering-road, Liverpool, of Mr. Christopher O. Ellison, aged seventy-one years. Mr. Ellison was the senior partner of the firm of Messrs. C. O. Ellison and Son, of Liverpool, architects and surveyors. Mr. Ellison had an extensive practice in the northern counties, and the firm were among the eighteen who were invited by the London County Council to submit competitive designs for the erection of working-class dwellings upon a part of the site at Millbank, as cleared by the demolition of the convict prison; in February, 1894, they gained the first premium for the North Wales Counties Asylum, at Denbigh; in our columns of November 27, 1897, we described and commented upon their invention, "the O.B. closet," for minimising the noise of the flush. Messrs. C. O. Ellison and Son were architects of the new Infirmary in Smithdown-road for the Toxteth Guardians, Liverpool (1893-4), and of the extensive additions thereto made five years subsequently; of Bevington House, for the People's Homes Co., at Bevington Bush, Liverpool, begun in June, 1898, and opened for 450 lodgers on January 11, 1900, with provision in the plans for 650 beds when completed, and established after the plan of the "Rowton Houses" in London; and of the Bradstock Lockett Home at Stockport for Crippled Children (1901-2). They prepared the plans and designs for the Town Hall in Hamilton-road, Birkenhead; the Eye, Ear, and Throat Hospital for Shropshire and Wales in Marivance, Shrewsbury (1891); hospitals at Belper and Boodle; and, in Liverpool, of the Eye and Ear Hospital, in St. Paul's-square; the artisans' dwellings (1890) for the Corporation; the Adelphi Hotel, in Ranelagh-place, W.; the Adelphi Bank; and the Eye and Ear Infirmary, in Myrtle-street. They were the architects of several Board schools in Lancashire, and of churches in some of the large towns of Yorkshire, W.R., in Rugby, Newcastle-on-Tyne, and elsewhere, and of the promenade at Douglas, in the Isle of Man. We may add that Mr. Ellison, an enthusiastic volunteer, was mainly instrumental in the founding and establishment of the 1st Lancashire Engineer Volunteer Corps, Liverpool; on his retirement from the command of the regiment, in 1875, he was appointed its honorary colonel, and eleven years ago he was presented with the "V.D." in recognition of his long service in the auxiliary forces of the Crown.

MR. LANSDOWNE.—We have also to announce the death of Mr. E. A. Lansdowne, member

of the firm of Messrs. Lansdowne and Griggs, of Metropolitan Bank-chambers, Newport, Monmouthshire. In conjunction with the late Mr. Thomas M. Lockwood, of Chester, Mr. Lansdowne prepared the plans and designs for the town hall and municipal offices, Newport, of which we published three illustrations, with plans, on August 29, 1885—in the competition he and Mr. Lockwood won the first and second premiums, respectively, and they were ultimately appointed to be joint architects of the building; Mr. Lansdowne was also employed as architect (1893-4) for the alterations, with improvements, of the Duffryn, at St. Nicholas, near Cardiff, for Mr. John Cory, J.P., etc. Of the principal architectural works carried out by him and his partner, Mr. H. J. Griggs, we may instance the following:—The institute and mission hall at St. Nicholas, Cardiff; extension of the British Schools in Park-street, for the Blaenavon School Board; additions, etc., to the workhouse buildings at Panteg, and at Griffithstown, for the Pontypool Union Guardians; the cottage hospital, for accident cases, with operation theatre, convalescents' day-rooms, and three wards, near Hillside House, Ebbw Vale, Mon.; hotels at Tredegar Junction and Casrphilly (the King's Arms), for Griffiths Brothers, Ltd.; the schools near Crumlin and (for 400 children) at Lower Garndiffaith, Pontypool, for the Trevechin School Board; the School at Pontnewynydd; and the parish hall in Risca-road, Newport. Amongst their most recent works are comprised the enlargement, etc., of the Williams Endowed Schools at Caerleon; the Infants' School at Garndiffaith; the rebuilding of the Three Salmons Inn, at Bassalley, for Lloyd and Yorath, Ltd.; an extension of the Gwehelog School, near Usk; the rebuilding of the Greyhound Hotel, at Christchurch, near Newport; the church institute and school for St. John the Baptist Church, Newport; and the Tredegar Arms Hotel, at Pill, Newport.

MR. JOSEPH MASTIN.—After a painful illness, the death took place on Saturday last, at his residence, 256, Fulwood-road, Sheffield, of Mr. Joseph Mastin, head of the Sheffield firm of builders and contractors, 15, Cavendish-street. The deceased, who was sixty-six years of age, was a native of Shropshire, and came to Sheffield about forty-five years ago, starting business on his own account ten years later. For the last twenty-two years his place of business was in Cavendish-street, and during that time he has erected many large buildings in the city.

STAINED GLASS AND DECORATION.

REDECORATION OF THE ASSEMBLY ROOMS, BATH.—The redecoration of the Bath Assembly Rooms is now being undertaken. The rooms, which were originally erected from the designs of the younger Wood, are being restored under the supervision of Mr. Stanley D. Adhead, architect.

GENERAL BUILDING NEWS.

CHURCH TOWER, ARMLEY, LEEDS.—Twenty-seven years after the consecration of the church, the tower of St. Bartholomew's, Armley, Leeds, has just been completed. The church itself, by the side of which stands the original building erected in 1630, was built at a cost of 25,000*l.*, and was consecrated in 1877. The base of the tower was at that time carried 75 ft. above the ridge of the roof, being a total elevation of 153 ft., and was left incomplete through lack of funds. The new tower has been erected from the designs of Messrs. Walker and Athron, the architects of the church, Mr. J. T. Wright being the contractor for the masonry. Altogether, the tower with spire is a little short of 200 ft., and on the apex is a gilt knob surmounted with a gilded iron cross 9 ft. high.

WESLEYAN METHODIST CHURCH AND SUNDAY SCHOOL, HEBDEN BRIDGE, YORKSHIRE.—The foundation-stones of the new Wesleyan Methodist church and Sunday school at Hebden Bridge, have been laid. The buildings are estimated to cost 4,500*l.* The ground floor provides for a large school-room, a young men's room, infants' room, and nine class-rooms, with heating accommodation; while the chapel above will seat 500 people. The premises will be lighted by electricity. Mr. W. H. Cockerott, of Hebden Bridge, is the architect. The work is being carried out by the following contractors:—Masonry work, Messrs. H. Mortimer and Sons, Hebden Bridge; carpentry and joinery, Mr. Robertshaw, Greenwood, Hebden Bridge; slating and plastering, Messrs. Wrigley and Son, Hebden Bridge; plumber's and glazier's and heating work, Messrs. Boulton and Kershaw, Mytholmroyd; concretor's work, Messrs. Greenwood and Son, Halifax.

NEW PRIMITIVE METHODIST CHURCH AND SCHOOLS, WALSALL.—The foundation-stones were laid recently of the new Primitive Methodist church and schools which are being built in Stafford-street, Walsall. The buildings are being erected from the plans of Messrs. John Wills and Sons, of Derby and London, and will accommodate a congregation of 650 persons. The general design is late English Gothic. There will be a tower and spire. The front of the building is being faced with best red Accrington bricks, and the dressings are being executed in terra-cotta. The glazing is in cathedral leaded lights. The cost of the buildings, which will also include a school with assembly room and five classrooms, will be 4,550*l.* The builders are Messrs. Henry Gough and Son, of Wolverhampton.

NEW SCHOOL, TULLIBODY, N.B.—On the 20th ult. a new school was opened in the parish of Alloa, at Tullibody. The building is built to accommodate 320 pupils. The total cost being 4,100*l.* Messrs. Thomas Frame and Son, architects, Alloa, prepared the plans for the work.

PARISH HALL, SUNDERLAND.—The foundation-stone of the new Sunday school and parish hall, which is to be erected in Fulwell-road, Sunderland, in connexion with All Saints' Church, was laid on the 20th ult. The plans for the new building have been prepared by Messrs. W. and T. R. Milburn, and the work is being carried out by Mr. J. R. Birney. The cost is 1,500*l.*

PUBLIC LIBRARY, KEIGHLEY.—The opening of the Carnegie Public Library, at Keighley, took place on the 20th ult. The new building occupies a site in North-street. It has been erected with slight modification from the plans submitted by Messrs. A. McKewan and James A. Larn, of Birmingham, and placed first by Mr. Leonard Stokes, the assessor, out of the 146 competitive designs sent in. Sufficient land is provided on the south side for extensions, and the important rooms—viz., the lending library and news-room, and reference library, have therefore been placed on that side. The premises are designed in a free treatment of Early Renaissance. The ground floor contains the lending library and news-room. The library has accommodation for 40,000 volumes, and the news-room will seat about 150 readers. Access to both is obtained from the entrance hall. The reference library, with accommodation for 100 readers; the patent library, and the book-room are on the first floor. All the walls are plastered, and the principal rooms have tile dadoes. The floors are of solid wood blocks, with mosaic work for the halls and passages. Red deal, stained green, has been used for the woodwork, but the furniture throughout is of fumed oak, dull polished. The rooms are lighted by electricity, with a separate system of gas-lighting in case of emergency. Local stone has been used for the outside structure, and the roofs are covered with green Fibberthwaite slates. The stone carving was executed by Mr. Alex

Smith (Keighley). The work has been carried out under the superintendence of Mr. Robert Midgley, one of the Corporation building inspectors, as clerk of works. It is anticipated that the total cost will not exceed the sum of 10,000*l.* given by Mr. Carnegie.

BUSINESS PREMISES, HALIFAX.—New business premises have been erected in Commercial-street, Halifax, for Messrs. Alexander Scott, Ltd. The principal contracts have been carried out as follows:—Masonry, Messrs. Crawshaw and Sons, Ripponden; joiners' work, Messrs. Moore and Sons, Clifton; plumbing and glazing, Mr. T. Boccock, Halifax; electric light, Messrs. H. Nunn and Co., South Parado; fibrous plaster ceiling and painting, Messrs. Jonas Binns and Son; iron and steel work, Messrs. Wood and Co., Manchester; plastering, Mr. Bancroft, Halifax. The architect was Mr. W. Clement Williams.

NEW PREMISES, BANBURY.—New business premises are to be erected at the corner of the town hall buildings, at Banbury. The work is to be carried out from the plans of Mr. W. E. Mills, architect.

NEW OFFICES OF THE GLASGOW CLEANSING DEPARTMENT.—The Glasgow Cleansing Department have moved into new premises in Cochrane-street. The premises have been remodelled under the supervision of Mr. M'Donald, the City Engineer.

ALTERATIONS TO THE TOWN HALL, LEEDS.—The reconstruction of the orchestra and ante-rooms at the Leeds Town Hall is now being carried out. The old structure has been removed, with the exception of the platform, and it is being replaced by a larger orchestra, which is of classic design. The seating accommodation has been arranged for a chorus of 354, and a band of 221. Previously there were only permanent seats for 300. The existing doors on each side of the orchestra will open into a square vestibule, and folding-doors will be fixed between the ante-room and the hall. Two retiring-rooms for principals have been provided under the platform, and also a band-room, the latter being on a level with the crypt. Additional facilities have been planned for reaching and leaving the orchestra. Mr. J. B. Fraser, architect, Leeds, planned the alterations, and the cost is estimated at 1,200*l.*

NEW HOSPITAL, NEWCASTLE.—At the annual meeting of the Newcastle Throat and Ear Hospital, held on the 17th ult. it was proposed that a new hospital should be erected at a cost of 4,500*l.* Mr. Parsons, architect, of Newcastle, has prepared the plans for the proposed work.

ISOLATION HOSPITAL, PONTYPRIDD.—The opening of the isolation hospital erected by the Pontypridd District Council at Llantwit Fardre was performed by Sir Alfred Thomas, M.P., recently. The hospital is situated on the right-hand side of the road leading from Ponteg to Llantwit Church. The hospital is built in terraces in four separate blocks, consisting of an administrative block, with accommodation for matron and for nurses; two separate pavilions, each containing a six and four bed ward, nurses' kitchen, lavatories, bathrooms, and other necessary offices, and the laundry block, which consists of washing and ironing rooms, disinfectant and disinfecting rooms, mortuary, and accommodation for ambulance van. The total cost of the buildings is 6,700*l.* The work has been carried out from drawings prepared by Mr. Edward Rees, late Surveyor to the Council, acting in conjunction with Dr. Howard Davies, the Medical Officer of Health. The contractor was Mr. William Davies, Hopkinstown, the clerk of works being Mr. W. J. Davies, Pontypridd.

FREE LIBRARY, IKESTON.—The Ikeston Free Library has just been opened. The new building occupies a site in the Market-place. It is designed in the Renaissance, and is built of red brick and stone. On the ground floor are a porch, space for cycles, entrance hall, lending library in the centre, with the news-room and ladies' room on the right, and reference library and magazine room on the left. On the first floor, which is reached by a stone staircase, are two rooms for students' library and patent library, with a storage gallery round the upper portion of the lending library. The librarian's house is situated in South-street, and includes a librarian's room in communication with the lending library. The staff-rooms (for both sexes), unpacking-room, magazine store, book store, heating chamber, coals, etc., are approached by a separate entrance from South-street. The building has been fitted with polished oak fittings. The borrowers' counter is 40 ft. long. The book stands and shelving will hold about 19,000 volumes; and the main rooms on the ground floor will accommodate 110 readers. The whole building is lighted throughout with electric light. The building was erected by Mr. Thomas Barlow, of Nottingham, to the

designs of Messrs. Hunter and Woodhouse, of Belper and Derby.

EXTENSION OF NORTHWICH INFIRMARY.—A mid-Cheshire memorial of the late Queen Victoria, the foundation-stone was laid on the 25th ult. of an extension of the Victoria infirmary. The work, which will involve an outlay of about 5,000*l.*, has been designed by Mr. C. E. Bolshaw, architect, Southport, and C. E. Crewe. It will provide for twelve additional beds, together with nurses' duty-rooms, operating and anaesthetic rooms, offices, sitting-rooms, etc. The annex will be coupled up with the existing institution, and the opportunity will be taken advantage of to establish the patients' rooms (now upstairs) on the ground floor.

SHOPS, VAUXHALL BRIDGE-ROAD.—A block of shops, with residential flats over, is to be erected on the site of Nos. 253 to 256, Vauxhall Bridge-road (Victoria street end). The buildings to have a roof garden approached by electric lift. The elevation will be carried out in red brick, with brick carving and terra-cotta dressings. Messrs. Palgrave and Co., Westminster, are the architects.

BUSINESS PREMISES, DUBLIN.—The reconstructed premises of Messrs. Charles L. Rea and Co., in Grafton-street, Dublin, have just been opened. Mr. Lynn, architect, Belfast, designed the building, and the contract was carried out by Messrs. Laverty and Co., Belfast.

NEW ARCADE, BEDFORD.—The building of the new arcade between High-street and Harpur-street, Bedford, is now in progress. The work is being carried out by Mr. Cornelius Haynes, contractor, of Kempston, from the plans of Messrs. Usher and Anthony.

APPOINTMENTS.

THE CROWN SURVEYORSHIP.—The appointment of Surveyor to the Crown, rendered vacant by the recent decease of Mr. Arthur Green, who was formerly a member of the late firm of Archer and Green, has been conferred upon Mr. John Murray, F.R.I.B.A., of John-street, Adelphi.

VICTORIA AND ALBERT MUSEUM.—Consistently upon the retirement, through superannuation, of Major-General Festing, C.B., F.R.S., the President of the Board of Education has appointed Mr. W. I. Last, A.M. Inst. C.E., Senior Keeper of the Science Division of the Museum, to be Director of that division. Mr. Last has been senior keeper, with the special charge of the Engineering collections, during some years past. He gained the senior Whitworth Scholarship in 1877, and in 1887 the Watt Medal of the Institution of Civil Engineers.

CITY AND GUILDS TECHNICAL COLLEGE.—Professor W. Ernest Dalby has vacated the chair of Mechanical Engineering and Applied Mathematics at the Technical College, Finsbury, upon his appointment to the Professorship of Civil and Mechanical Engineering at the City and Guilds Central Technical College, Exhibition-road, S.W. in succession to Professor W. C. Unwin, F.R.S.

SANITARY AND ENGINEERING NEWS.

PROPOSED NEW DOCK FOR ABERDEEN.—Mr. R. Gordon Nicol, C.E., Harbour Engineer, has prepared, for the consideration of the Harbour Board, a scheme for a new dock on the Links, for the accommodation chiefly of the timber trade. The dock will be situated on the Links and foreshore behind the shipbuilding yards and to the north of Footdee-square, with an entrance from the tidal harbour on the east side of Poca Jetty. It will form a tidal basin 1,600 ft. long, with a width of 250 ft. at one end, and 500 ft. long at the other, while the depth will, in the first instance, be taken out to 15 ft. at low water of ordinary spring tides, and be deepened afterwards when found necessary. It will be protected from the sea by a strong embankment wall, extending from the beach battery to the North Pier, and the area thus reclaimed from the foreshore will provide space for the landing and storage of timber. For the construction of the dock about 16 acres of ground on the Links will have to be acquired from the Town Council, and 25 acres of foreshore from the Crown. Mr. Nicol estimates, provisionally, the cost of the dock and sea wall at 125,000*l.*, which will require to be added to the cost of the necessary land.

WATER SUPPLY, CHRIST'S HOSPITAL.—The Governors of Christ's Hospital are about to carry out the extension of their water supply by sinking a deep shaft and driving storage adits. The work will be carried out by Messrs. Duke and Ockenden, waterworks contractors, of London and Littlehampton.

DOCK IMPROVEMENTS, PENNAN, N.B.—Foundation-stone was laid recently of the pier at Pennan, which completes the scheme of improvement planned by Mr. James Brown, C.E., Aberdeen. The new structure is 356 ft. long, and the cost is estimated at £800.

SEWERWORKS EXTENSION, NEWBURGH, N.B.—A scheme for the provision of a supply of water to the hill district of Newburgh, and for the purification of the whole of the town's supply, which has been in process of construction since March, under the superintendence of Messrs. Sang and Lockhart, C.E., was opened recently. The filtration of the water is accomplished by means of self-cleansing pressure filters.

FOREIGN.

GERMANY.—The façade of the new town hall in Dresden is to be built according to the designs of the architect, Herr Karl Roth, of Chemnitz, but the ground plans by Herr Roth are to be utilised. The Society of German Architects and Engineers will hold an annual meeting at Düsseldorf from September 11 to 14.

AUSTRIA.—Professor Karl Edler von Ottenthal on August 2 at Brünn, in his sixty-ninth year. The restoration of the "Minoriten" church at Vienna, which was entrusted to the architect, Professor Luntz, is being now carried out by Herr Ritter von Giacomelli. A new theatre is to be built at Vienna, which will be opened next spring. Herr Wilhelm Schöner is architect for the barracks that are to be erected at Bozen.

SWITZERLAND.—Herr G. Wülflke, architect, died at Zurich on August 13. The Mont-Cenero Railway has been open since August 13. The Swiss Society of Electricians held a meeting at St. Moritz on August 21 and 22; 150 members were present and fifty firms were represented.

MISCELLANEOUS.

COMPENSATION AWARD.—In his capacity of arbitrator, Mr. Ralph Clutton has just announced the terms of his award, amounting to £8,110*l.*, in respect of a claim preferred by John Murray, of Albemarle-street, Piccadilly. The controversy arose in the course of the construction of the Great Northern, Piccadilly, and Brompton Railway Company's line and the building of a station in Dover-street, with a consequent disturbance of Mr. John Murray's property and business.

THE CLOISTER OF ST. BARTHOLOMEW'S, WESTMINSTER.—Complete legal possession has been obtained of the stables in Barlow Close in which are buried the remains of the XVth century cloister on the north side of the Church of St. Bartholomew the Great. The work of restoration will be proceeded with by, firstly, clearing away the level ground, in an area of about 45 ft. by 110 ft., which now rises to within a short distance below the capitals of the columns; the building was mutilated for the building of billiard-rooms when the remains were conserved for stabling purposes. The arched gateway which formed an entrance into the cloister from the belfry tower, near the south-west corner, is at present bricked up, but it will be opened and restored to its original use.

DRURY-LANE THEATRE: L.C.C. REQUIREMENTS.—In moving the adoption of the report at an annual meeting of the Theatre Royal, Drury-lane, on Wednesday, Mr. T. H. Birch, chairman, referred to the extensive alterations which are now being carried out at the theatre. He said that, owing to the work being to be completed before the Christmas pantomime season, the theatre would have to be closed during the whole of the autumn, so the usual autumn drama would not be performed. Mr. Birch declared that while they were in the height of their last pantomime season, certain members of the London County Council went out of their way to make allegations against the safety of the theatre, and even taking the trouble to verify the same on which they based their conclusions. Many of the requisitions of the Council were very unreasonable and exacting character, they were informed by the Superintendent-Architect to the Council that even if the whole of the requirements were complied with, they would not be satisfied. Mr. Birch went on to deal with the appeal made by the directors, and its result in the appointment of John Slater, F.R.I.B.A., as arbitrator. The result of arbitration had been the disallowing of many of the requirements and the modification of others, but as it was the cost of the works ordered by the arbitrator would be about 20,000*l.* or 25,000*l.* Mr. Arthur Birrell, the managing director, speaking on

the same topic, said that the County Council had used the fire at Chicago as a lever, but such a fire as that could never occur at Drury-lane.

CAPITAL AND LABOUR.

GLASGOW MASON'S STRIKE.—A meeting of the men was held on the 25th ult. in the Albion Halls, Glasgow, to consider the proposed arbitration, which was the outcome of the preceding day's negotiations between the labour representatives of the Corporation and the Lord Provost. It is stated that, after a prolonged discussion, it was agreed by a large majority to accept the masters' terms of 9*d.* per hour. A deputation was appointed to proceed to the headquarters of the federated employers in order to sign an agreement in accordance with the decision. The strike now at an end lasted for about six weeks. At the outset over 2,000 men were affected, but during the last few weeks of the strike fully half of these were restarted owing to several employers agreeing, conditionally, to the demands of the operatives.—*Scotsman.*

Legal.

ANCIENT LIGHT DISPUTE.

In the Vacation Court on Wednesday Mr. Justice Bigham again had before him the case of Milton and another v. Maskelyne, on an application by the plaintiffs to restrain the defendant from so building in Langham-place, W., as to obstruct the plaintiffs' ancient lights.

Counsel stated that the parties were coming to an agreement, and asked that the motion should stand over for one week. The application was granted.

REMOVING OLD MATERIALS AT ILLEGAL HOURS.

On Tuesday at the Guildhall (Summons Court), before Mr. Alderman Simmons, George Tatum, builder, of Walerston-street, Harrow-road, appeared to a summons for causing certain materials—namely, old bricks—to be removed from a building in course of demolition during prohibited hours.

Police-sergeant Robt. Wilson deposed that at 120 on the 14th inst. he was in Arthur-street West, when he saw defendant's men carrying baskets of old bricks and shooting them into a cart. Having spoken to defendant's foreman some days previously, he went to defendant, who said his men were not acting in defiance of the law. On the previous day (the 17th) Mr. Tatum had gone down to the police station and read the by-law under which the summons was taken out.

In answer to defendant, witness said he was sure the men were carrying old bricks, and he called Constable Martin, who corroborated his statement.

Defendant said as soon as he knew it was illegal for him to remove old building material after ten o'clock in the morning he stopped his men working at ten o'clock. It was a loss to them and to him. The loads complained of were old rubbish from the foundation and the wood from the hoarding. The building in question had been pulled down inside the hoarding. He was under a contract to get it all cleared away, and in default was liable to a penalty of 20*l.* per week. Messrs. Mowlem had been at work in Arthur-street West for three weeks, and that had hindered him. In answer to the Alderman, defendant said he had been thirty-three years in the trade. It seemed almost worth it, a brick to pull down in the City. The Alderman said this was the first case under the new by-law for the regulation of pulling down buildings. It only came into force in July. The summons would therefore be dismissed, with a caution.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

14,374 of 1904.—D. F. HENRY, JUN.: *Continuous Kilns for Burning Fireproofing Tile, and other Clay Products.*

This consists in the combination of a kiln, having slotted walls, ware supports, movable in the kiln one above the other, each support consisting of tubular members united at their ends by manifolds, a tubular extension on each manifold projecting through the kiln slots, a combined water chamber and hanger at the outer end of each of said extensions, water supply and discharge means for each

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

of said chambers, and carrying means to which the combined chambers and hangers are pivotally secured.

20,789 of 1903.—J. BLACKBURN: *A Channel Way and Covers for Footpaths to Prevent Accumulation of Refuse.*

A footpath channel way, and cover therefor, consisting of a channel way of suitable section having plain vertical sides, a short, fixed covering at one end, with an aperture formed therein for receiving a down spout, one or more nuts, plates, or the like connected to, or integrally formed with, said channel way, and with or without one or more ridges formed on the tops of said sides; a removable cover, having a tongue at one end and a number of projections, and with or without a recess or recesses formed upon its underside, and provided with one or more counter-sunk holes, said cover being adapted after slipping said tongue beneath said short fixed covering of the channel way to be dropped in position thereon, and thereafter secured by one or more screws engaging said cover and nut or nuts, or the like.

22,512 of 1905.—W. HALL: *Street, and Similar Lamps.*

A street or similar lamp, fitted with a tube or pipe, terminating directly, or by branches, over a burner or burners within the lamp at one end, and at the other end extending up into a double-walled head part outside the lamp, and such head part, or its inner wall, formed with an opening, and with the space between its walls open to the atmosphere, the parts being so proportioned and arranged as to suit both for ventilation and lamp-lighting purposes.

22,769 of 1905.—N. PERFIGNANI and E. CANDLOT: *Kilns for Burning Cement, Lime, etc.*

A kiln for the burning of cement, lime, and the like, consisting of a circular grate arranged round the kiln below the combustion zone, the said grate forming cylindrical shaft and being surrounded by a casing, provided with openings for stirring the charge in the kiln.

30,003 of 1904.—G. STADE: *Process and Devices for Filtering Liquids.*

A process for filtering liquids by the utilisation of filtering material arranged at its natural incline, which process consists in causing the liquid to be filtered to first describe an angle at its escape from the filtering element, instead of being caused to flow in a straight course upon the inclined face of the filtering material, the angle causing the liquid to impinge against a solid body, so that the force of the forwardly-rushing current of liquid is broken at the said body, and is distributed in such a manner that the incline of the filtering material is prevented from taking up the main pressure at a single place, the said pressure being instead of that evenly distributed for the entire surface of the incline.

4,022 of 1904.—J. H. HATZEL, J. KREUZIGER, and P. MAACK: *A Moulding box for Forming Perforated Cement Bricks.*

This invention relates to a moulding-box for forming perforated cement bricks. It has for its object to overcome the disadvantages existing in similar moulding-boxes hitherto known by permitting the readier removal of the moulded bricks. In the ordinary boxes, as at present constructed, pins for effecting the perforation are fixed to the base of the moulding-box, so that the bricks could not be pushed out of the mould sideways, but had to be lifted off the pins by raising the base-plate, by means of a treadle arrangement. This inconvenience is avoided in this moulding-box.

7,227 of 1904.—A. BIBERFELD: *Decorative Building Block or Plate.*

A process for the production of building plates or blocks which consists in cutting out and shaping to the requisite design a fabric of wire or the like and causing crystals of candy alum, rock-salt, sulphate of copper, sulphate of iron, and the like to form thereon.

13,934 of 1904.—C. FOSTER: *Scaffolds, and the Method of Erecting the same.*

A scaffold consisting in the combination of a set of flexible cables, platforms supported thereby, outriggers from which the cables are suspended, and means for making the cables fast to the said outriggers at points between their ends, the upper portions of the cables extending beyond the outriggers, whereby such portions are arranged to be continued upward and suitably supported without interfering with the platforms below such outriggers.

17,029 of 1903.—W. A. C. WALLER: Apparatus for the Manufacture of Cement Blocks or Slabs.

An apparatus for manufacturing cement blocks or slabs, consisting of a mould having one or more moulding chambers, each of which comprises a bar forming one side of the chamber, two plates on opposite sides of the said bar, connected together and adapted to move relatively with said bar, means for effecting such relative movement, two hinged doors forming opposite sides of the chamber, and a removable bar forming a fourth side of the mould.

18,157 of 1903.—W. JONES: Domestic Fireplace. Grates or mantel register grates prepared with openings at the sides to show tiles, for effectively fixing enamelled slate panels or panels of any other material over the said openings, the said means consisting essentially in fixing one end of a shaped strip of steel or other suitable material to the grate by means of a screw and nut, and by tightening up the nut to bring the other end of the strip to press upon the panel, and thereby hold the same securely in position.

18,412 of 1903.—S. RANGELEY: Method of and Apparatus for Polishing the Surfaces of Flags, Ashlar, and the like.

The object of this invention is to abrade and polish the surfaces of flags, window mullions, door jambs, blocks of ashlar, and the like. The invention consists in placing flags and the like in suitable frames in such a manner that, by giving a reciprocating motion to one of the frames, the outer faces of four flags or the like can be polished simultaneously, the necessary friction for abrasion being obtained by the weight of the flags and frames themselves.

18,786 of 1903.—J. TOMLINSON and S. ABRAM: Ventilators.

The manufacture of louver ventilators from plastic material in one piece by pressure, consisting in forming the cores on top and bottom dies of the mould for producing the louvers of uniform configuration, each having one side vertical to the face of the die, and one inclined side so proportioned and disposed that the vertical sides of the upper die slide against those of the lower die as the article is being pressed.

20,184 of 1903.—LOCKEBIE and WILKINSON, LTD., and C. F. GRAY: Door Furniture.

This consists in the combination with the door furniture of a washer mounted loosely upon the spindle, and having means of attachment to the face of the door upon the side of the adjustable handle so as to form a stop or face against which the inner side of wedge washer butts.

21,103 of 1903.—A. CORTI: A Composition for Removing Lacquers, Varnish, Oil Paint, and the like, and Process for the Manufacture of the same.

A process for the manufacture of a composition or paint for removing lacquer, varnish, oil varnish, oil paint, and more especially burnt lacquers, which consists in stirring into a mixture of alcohol or acetone and petroleum and soft soap, a mixture of slaked lime with potash or soda without water.

21,236 of 1903.—R. S. BRANFORTH and W. B. DAVIS: Metallic Buckets, Baths, and other Washing Utensils.

A bucket, bath or other receptacle having a piece cut out from one side to form an opening, a pocket or opening closed on all sides save one, and the open side of the pockets fixed to the edges of this opening to form a soap tray.

13,857 of 1904.—D. BOWIE: Apparatus for Ensuring Safety in the Working of Hoists, Lifts, and the like.

An apparatus for ensuring safety in the working of hoists, elevators, and the like, which consists in providing vertically-sliding safety gates closing the gangways that lead to the hoist at the bottom, a trip device near the bottom of the hoist, and means for connecting said trip device with the safety gates moving part of the hoist as it nears the bottom strikes the trip device and raises the gates clear of the gangway, or permits them to close by gravity on the ascent of the cage.

14,624 of 1904.—H. ALLES: Wall Hook or Hold-fast for Pipes.

A wall hook, consisting in combination of two curved members adapted to clasp the pipe between them, one of said members being rigidly secured to the wall or the like, and the other of said members being hinged to said first member, and a lever pivoted to said first member, and adapted to engage a projection or the like on said second member, so as on turning said lever on its pivot to bring said members together to clasp said pipe.

14,656 of 1904.—R. G. HOWSON: Water-closets, Lavatory basins, and the like.

Water-closets, lavatory basins, and the like, consisting in the provision of carrying brackets upon the wall upon which they are to be mounted, and pins, bars, or plates upon the closet basin, or the like, and means for securing the latter upon the brackets and against the wall.

14,944 of 1904.—J. NELSON: Hinges.

A hinge consisting of the combination of flaps for fixing same, and knuckle portions with pin or pins for connecting the separate portions thereof, and second flaps or extensions provided with or without indiarubber blocks or pneumatic cushions on one or both flaps.

3,538 of 1904.—A. PROBST: Ceiling and Flooring.

A floor and ceiling in which the sides of each hollow block are provided with corrugations adapted to engage with the corrugated sides of the adjacent blocks characterised, that the joints between the corrugated sides of said blocks are formed over wires fastened to the floor-beams, and carried down the centres of cross-beams, said wires being adapted to relieve the weight of the hollow blocks upon the said cross-beams.

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SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT. August 17.—By STRIDE & SON (at Chichester). Oving, etc., Sussex.—Elbridge Farm, 138 a. 2 r. 9 p., £6,350. By SIMMONS & SONS (at Oxford). Nether Worton, Oxon.—The Nether Worton Estate, 37 a. 3 r. 14 p., £3,050. August 23.—By KING & KING (at Botley). Swanmore, etc., Hants.—Forest Farm, several cottages and enclosures, 176 a., £10,970. By FLEURET, SONS, & ALPHAS (at Masons' Hall Tavern). Brighton, Sussex.—"The Northern Hotel," with stabling and shop adjoining, £13,250. August 24.—By MURKIN, MILLS, & MADDOX (at Great Yarmouth). Great Yarmouth.—"Mill-rd.," "Hill Mill Estate," 1 a. 1 r. 38 p., £2,650. South Quay, freshhold malting, 480. Stalham, Norfolk.—Wayford Bridge malting, £1,900. Hensby, Norfolk.—Marham-rd., three freshhold houses, y.r. 18s., 300. August 25.—By NEWBORN, EDWARDS, & SHEPHERD. Stoke Newington.—49, Darville-rd., u.t. 72 yrs., g.r. 6l., c.r. 36l., 435. Ialham-rd., u.t. 26 yrs., g.r. 24l., y.r. 18s., 810. 23, Barnsbury-st., u.t. 19 1/2 yrs., g.r. 8l. 10s., c.r. 55l., 185. Holloway.—17, Upper Tottenham-rd., u.t. 64 yrs., g.r. 7l. 10s., y.r. 42l., 455. 33, Despard-rd., u.t. 80 yrs., g.r. 6l., c.r. 32l., 265. Finsbury Park.—140, Stroud Green-rd., u.t. 59 1/2 yrs., g.r. 7l., c.r. 45l., 455. Stanmore.—Stanmore Hill, "Talbot House," 780. Stanmore Hill, "Northampton House," l., y.r. 25l., 510. Stanmore Hill, "Child's Cottages," area 3,000 ft., l., 220. By PERFECT & SON. Hammersmith.—8, 9, and 10, Chancellor-st., u.t. 30 yrs., g.r. 27l., w.r. 72l., 150. Holloway.—53, St. John's-rd., u.t. 45 yrs., g.r. 10l. 10s., c.r. 42l., 310. By SIMMONS & SONS. Brixton.—17, 18, and 19, Charbel-rd., u.t. 94 yrs., g.r. 15l. 9s., y.r. 96l., 320. Camberwell.—55, Westminster-st., l., w.r. 74l. 8s., 415. Homerton.—Durrington-rd., l.g.r. 6l., reversion in 95 yrs., 113. Durrington-rd., freshhold plot of building land Old Kent-road.—156, 158, Cobourp-rd., u.t. 11 yrs., g.r. 6l., w.r. 75l. 8s., 165. Stoke Newington.—37, Bethune-rd., u.t. 70 1/2 yrs., g.r. 8l., c.r. 60l., 450. Waltham.—3 and 5, Aliver-st., l., w.r. 74l. 8s., Peckham.—127, Gloucester-rd., u.t. 38 1/2 yrs., g.r. 8l., w.r. 39l., 270. Contractions used in these lists.—F.g.r. for freshhold ground-rent; l.g.r. for leasehold ground-rent; l.f.r. for improved ground-rent; c.r. for copyhold-rent; for rent; f. for freshhold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; l. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; g.r. for grove; b.h. for berthouse; p.h. for public-house; o. for office; s. for shops; c. for court.

PRICES CURRENT OF MATERIALS

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table with columns for material types (e.g., Hard Stocks, Rough Stocks, Facings, etc.), prices in £ s. d., and quantities. Includes sections for GLAZED BRICKS, STONE, and HARD YORK.

SLATES.	
£ s. d.	per 1000 of 1200 at r. d.
Best blue Bangor	13 17 6
First quality "	13 0 0
" "	13 15 0
" "	7 5 0
Best blue Port-	12 12 6
modoc	6 12 6
Best Eureka un-	15 17 6
fining green	18 7 6
" "	13 5 0
" "	10 5 0
" "	11 12 6
Permanent green	11 12 6
" "	6 12 6

TILES.	
£ s. d.	per 1000 at rly. depot.
Plain red roofing tiles	42 0
and Valley tiles	3 7 per doz.
Roof tiles	50 0 per 1000
Decorative tiles	52 6
and Valley tiles	4 0 per doz.
Carbon red, brown, or	57 6 per 1000
colored do. (Edwards)	60 0
Decorative do.	4 0 per doz.
and Mottled Stafford	3 0
red do. (Peakes)	51 9 per 1000
Decorative do.	54 6
and Valley tiles	4 1 per doz.
Roof tiles	3 8
" Rosemary brand	48 0 per 1000
Decorative do.	50 0
and Valley tiles	4 0 per doz.
Roof tiles	3 8
" Hartshill brand	48 0 per 1000
Decorative do.	50 0
and Valley tiles	4 0 per doz.
Roof tiles	3 6

WOOD.	
At per standard.	£ s. d.
Best 3in. by 11 in. and 4 in.	15 10 0
Best 3 in. by 11 in.	14 10 0
Best 3 in. by 7 in. and 4 in.	11 10 0
Best 2 1/2 in. by 6 in. and 3 in.	10 10 0
Best 2 1/2 in. by 6 in. and 3 in.	10 10 0
Seconds	1 0 0 less than best
Seconds	1 0 0
By 4 in. and 2 in. by 6 in.	9 10 0
By 4 in. and 2 in. by 5 in.	8 10 0
Sawn Boards—	0 10 0 more than
and 1 1/2 in. by 7 in.	battens.
Best middling Danzig	At per load of 50 ft.
(average specification)	4 10 0
Best "	4 5 0
Timber (8 in. to 10 in.)	3 12 6
Timber (6 in. to 8 in.)	3 0 0
Shish planks	2 15 0
pine timber (30 ft. average)	3 5 0

JOINERS' WOOD.	
At per standard.	£ s. d.
Sea: first yellow deals,	23 0 0
by 11 in.	24 0 0
by 9 in.	21 0 0
by 7 in.	17 0 0
by 11 in.	18 10 0
by 9 in.	17 10 0
by 7 in.	13 10 0
by 11 in.	15 10 0
by 9 in.	14 10 0
by 7 in.	11 10 0
by 11 in.	21 0 0
by 9 in.	18 0 0
by 7 in.	15 0 0
by 11 in.	16 0 0
by 9 in.	14 0 0
by 7 in.	11 0 0
by 11 in.	13 10 0
by 9 in.	13 0 0
by 7 in.	10 0 0
by 11 in.	14 10 0
by 9 in.	13 10 0
by 7 in.	10 0 0
by 11 in.	14 10 0
by 9 in.	13 10 0
by 7 in.	10 0 0
by 11 in.	14 10 0
by 9 in.	13 10 0
by 7 in.	10 0 0
by 11 in.	14 10 0
by 9 in.	13 10 0
by 7 in.	10 0 0

OILS, &c.	
per gallon	£ s. d.
Raw Linseed Oil in pipes	0 1 7
" " in barrels	0 1 8
" " in drums	0 1 10
Bolled " in pipes	0 1 9
" " in drums	0 1 10
Turpentine, in barrels	0 3 6
" in drums	0 3 8
Genesee Ground English White Lead	18 10 0
Red Lead, Dry	18 10 0
Best Linseed Oil Putty	0 6 6
Stockholm Tar	1 12 0

VARNISHES, &c.	
Per gallon.	£ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hand-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flating Varnish	0 18 0
White Copal Enamel	0 15 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 8 0
Bruswick Black	0 16 0
Berlin Black	0 16 0
Knottling	0 10 0
French and Brush Polish	0 10 0

WOOD (continued).		Per square.
£ s. d.	£ s. d.	£ s. d.
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and mated	0 12 6	0 15 0
1 1/2 in. by 7 in. white, planed and mated	0 15 0	0 16 6
3 in. by 7 in. yellow, mated and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. do. do.	0 14 0	0 15 6
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do.	0 11 0	0 13 6
6 in. at 6 ft. to 9 ft. per square less than 7 in.		

JOISTS, GIRDERS, &c.		In London, or delivered
£ s. d.	£ s. d.	Ballway Vans, per ton.
Rolled Steel Joists, ordinary sections	8 15 0	8 5 0
Compound Girders, ordinary sections	8 2 6	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 0
Fitted Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6	8 5 0

METALS.		Per ton, in London.
£ s. d.	£ s. d.	£ s. d.
Common Bars	7 5 0	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0	8 5 0
Staffordshire "Marked Bars"	10 0 0	9 0 0
Mild Steel Bars	9 5 0	9 10 0
Hoop Iron, best price	9 5 0	9 10 0
" Galvanized	17 10 0	17 10 0
(*And upwards, according to size and gauge.)		
Sheet Iron, Black	9 15 0	—
Ordinary sizes to 20 g.	10 15 0	—
" 24 g.	12 5 0	—
" 26 g.	12 5 0	—
Sheet Iron, Galvanized, flat, ordinary quality—		
Ordinary sizes—5 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	—
Ordinary sizes to 22 g. and 24 g.	13 5 0	—
" 26 g.	14 5 0	—
Sheet Iron, Galvanized, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0	—
" 22 g. and 24 g.	16 10 0	—
" 26 g.	18 0 0	—
Galvanized Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0	—
" 22 g. and 24 g.	13 0 0	—
" 26 g.	13 15 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0	—
" 26 g.	14 0 0	—
Cut nails, 3 in. to 6 in.	9 0 0	9 10 0

LEAD, &c.		Per ton, in London.
£ s. d.	£ s. d.	£ s. d.
LEAD—Sheet, English, 3 lb. and up	14 10 0	—
Pipe in coils	15 0 0	—
Soil pipe	17 10 0	—
Comp. pipe	17 10 0	—
ZINC—Sheet	27 10 0	—
Vieille Montagne	27 5 0	—
Silesian	27 5 0	—

ENGLISH SHEET GLASS IN CRATES.		per ft. delivered.
£ s. d.	£ s. d.	£ s. d.
15 oz. thirds	24d.	13d.
" fourths	24d.	13d.
21 oz. thirds	34d.	17d.
" fourths	24d.	13d.
25 oz. thirds	44d.	21d.
" fourths	34d.	17d.
32 oz. thirds	54d.	25d.
" fourths	44d.	21d.
Fluted Sheet	15 0 0	—
" 21 oz.	4d.	—
" Hartley's Balled Plate	13d.	—
" "	2d.	—
" "	24d.	—

TO CORRESPONDENTS.
F. R. H. (Amount should have been stated).—F. P. —T. W. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, manuscripts, or other documents sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lead a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

BATH.—Alterations and decoration, Syncombe House, for Mr. G. H. B. Moger. Mr. E. S. Payton, architect and surveyor, 3, Wood-street, Bath:—

J. Long & Sons	£ 270 0
Wills & Sons	559 0
Praet & Co., Bath	£ 387 .. £ 165 0*
F. Parsons	350 .. 166 10
W. Webb, Bath	333* .. 153 10
Cottrell Bros.	217 10
Knight & Son	160 0 ..

BATH.—For alterations and decoration, drainage, etc., 10, Lama-place, Bath, for Messrs. F. H. & R. A. Moger. Mr. E. S. Payton, architect, 3, Wood-street, Bath:—

Cottrell's, Ltd.	£ 545
Parsons, Bath	£ 520
Knight & Son	343
Amery	425
Wills & Sons	529
Withdrawn	—

BATH.—For addition, bath room, etc., 32, Brock-street, Bath, for Mr. Duncan Harding. Mr. E. S. Payton, architect, 3, Wood-street, Bath:—

West	£ 184 0
Long & Son	£ 124 0
Webb	145 0
Wills & Sons	119 10
Parsons	139 0
Bath	119 10

BLACKADON.—For painting, etc., the Asylum Buildings at Blackadon, near Ivybridge, for the Visiting Committee:—

J. H. Hosking, Charlotte-street, Moricetown, Devonport	£ 132
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BRIDGWATER.—For removing existing stone arch and substitution of steel structure, to cradle bridge over King's Sedgmoor drain, for the Somersetshire Drainage Commissioners. Mr. Wm. Lunn, A.M.I.C.E., Bridgwater, Engineer to the said Commissioners:—

Gleed Bros.	£ 189 10 0
A. Stevens	£ 105 0
J. Culverwell	180 5 0
Pittard & Son,	—
F. Hulsh	120 0 0
Langport	102 15 0

BRISTOL.—For erecting a new surgery, for Dr. James Young, St. George. Mr. W. H. Watkins, architect, 15, Clare-street, Bristol:—

T. R. Lewis	£ 222
G. A. Hayes	£ 507
E. Clark	£ 220
J. Perkins	£ 604
Neale Bros.	£ 680
E. Love	£ 502
G. Humphreys	£ 565
A. J. Beaven	£ 489
Bennett Bros.	£ 560

BRISTOL.—For a private school at Burnham, Somerset, for Mr. T. J. Spencer. Mr. T. J. Moss-Flower, C.E., architect and surveyor, Carlton-chambers, Baldwin-street, Bristol. Quantities by Mr. W. L. Bernard, St. Stephen's-chambers, Bristol:—

H. W. Pollard	£ 9,900
R. F. Ridd	£ 8,593
C. E. Peckin & Sons	£ 8,795
T. Stockman	£ 7,998
W. Cowlin & Son	£ 8,717
Chancellor & Sons,	—
C. Taylor	£ 8,600
Bath	£ 7,790

BRISTOL.—For electric lighting, wiring, and fittings at Nynhead Court, Wellington, Somerset, for Mr. G. S. Lyssaght. Mr. T. J. Moss-Flower, C.E., engineer, Carlton-chambers, Baldwin-street, Bristol:—

Stansell & Sons, Tauton	£ 2754
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Oil Engine.
Petter & Sons, Yeovil and Bristol

BRITON FERRY.—For supply of road metalting, for the Urban District Council. Mr. H. Alex. Clarke, Engineer and Surveyor, Council Offices, Briton Ferry:—

Per ton. Per ton.	
Gauge 2 in. 1 1/2 in. Chippings	—
L. Sumnerfield	8 6 0 .. 8 9 0
J. Runnalls	8 0 0 .. 8 0 0
6 0 Penlee Basalt	—
Portugian Quar-	—
ries	7 0 0 .. 7 0 0
Oranite	—
J. E. Ordlith	6 0 0 .. 6 3 6
6 0 Limestone.	—
T. Ellis	5 8 0 .. 5 11 0
T. Jenkins & Sons	5 7 0 .. 5 7 0
W. P. Powell & Co., Hivwain	5 0 0 .. 5 0 0

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Design to be Delivered.
*New Public Offices	Wallasey U.D.C.	250 <i>l.</i> , 75 <i>l.</i> , and 50 <i>l.</i>	Get.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tender to be Delivered.
Shooting Lodge, Carr Bridge, Duthil.	Strathspey Estate	Strathspey Estate Office, Granttown, N.B.	Sept.
Painters' Works to Roofs of Cattle Market	Glasgow Corporation	City Engineer, City-chambers, 64, Cochrane-street, Glasgow	do.
60 Lockers, 6 Cupboards, etc., Gravelly Hill Works.	Aston Guardians	Workhouse	do.
Thirty-seven Cottages at Mountain Ash	Avenfrow Cottage Co.	Morgan & Elford, Architects, Mountain Ash	do.
Thirty-six Cottages at Mountain Ash	Park Cottage Co.	do.	do.
Fitting-up Poorhouse, Oldmill	Aberdeen City Parish Council	Brown & Watt, Architects, 17, Union-terrace, Aberdeen	do.
Engine House and Bed, Albion Mills, Idle	W. Samuel	J. H. Bakes, Architect, Calverley-chambers, Victoria-sq., Leeds	do.
Seven Brick Dwelling-houses, Nantir Est., Blangarnw	The Committee	Dwyer, 16, Brynbedw-terrace, Blangarnw	do.
Primitive Methodist Church, Eymouth	Southend Masonic Hall Co.	W. Gray & Nephew, Architects, 2, Ivy-place, Berwick-on-Tweed	do.
Heating Barham Chapel, Beaufort	Barking Town U.D.C.	L. Jones, Architect and Surveyor, Beaufort	do.
Extension of Masonic Club Premises, The Broadway	do.	J. Thompson, Architect, Preston-road, Southend-on-Sea	do.
Rails, Fishplates, and Bolts	do.	H. Hargreaves, Clerk, Public Offices, Barking, Essex	Sept.
Permanent Way Construction	do.	do.	do.
Overhead Line Equipment	do.	do.	do.
Underground Feeder Cables	do.	do.	do.
Stabling, etc., Clifton-road Depot, Burgess Hill	U.D.C.	Surveyor, Council Office, Church-road, Burgess Hill	do.
Re-making, etc., Sewer by Crescent, Bridlington	do.	S. Dyer, Architect, 29, Quay-road, Bridlington	do.
200 Tons of Broken Granite	Shoehurness U.D.C.	F. Gregson, Clerk, Southend-on-Sea	do.
Water Supply, Otterton	St. Thomas R.D.C.	D. Cameron, Engineer, 7, Bedford-circus, Exeter	Sept.
Apparatus, Boroughmuir High Grade School	Edinburgh School Board	J. Arnott, Clerk, Castle-terrace, Edinburgh	do.
Additions, etc., Newtown British Schools, Trowbridge	The Managers	T. B. Silcock & S. S. Reay, Architects, 47, Milcom-street, Bath	do.
Morrison to Pontardawe Road Widening	Glamorgan County Council	Glamorgan County Council Offices, Cardiff	do.
Widening Pontardawe, etc., Road, at Gelligron	Aberdeen Harbour Commissioners	R. Gordon Nichol, Engineer, Harbour Engineer's Office, Aberdeen	do.
1,000 Tons of Portland Cement	Rhonda U.D.C.	W. Beddoe Rees, Architect, 37, St. Mary-street, Cardiff	do.
English Pres. Ch., etc., Thorpe, Llandrindod Wells	Greslet R.D.C.	W. J. Jones, Surveyor, Public Offices, Pentre, Rhonda	do.
Street Works, Stanford-le-Hope, Essex	Lanark Upper Ward District Com.	S. I. Adams, Surveyor, Weston-chambers, Southend-on-Sea	do.
14 Miles Cast-iron Pipes and Service Tank	Swansea Guardians	Warren & Stuart, Engineers, 94, Hope-street, Glasgow	do.
Ventilation of Dining-rooms, etc., Workhouse	Hale U.D.C.	L. Jenkins, Clerk, Union Offices, Alexandra-road, Swansea	do.
Macadamising Streets, Falkirk, Scotland	Burslem Town Council	D. Ronald, Burgh Engineer, Burgh-buildings, Falkirk	do.
Making-up Queen's-road, Hale	do.	T. Blagburn, Surveyor, Hale, Cheshire	Sept.
Electric Lighting Station	do.	Borough Surveyor's Office, Queen-street, Burslem	do.
Brick Chimney Shaft, 120 ft. high	Southend-on-Sea Corporation	E. J. Elford, Borough Surveyor, Southend-on-Sea	do.
Purifier, 10 ft. by 10 ft.	Wimbledon U.D.C.	City Engineer's Office, Municipal-buildings, Leeds	do.
Paving and Flagging Streets	Woolwich Guardians	C. H. Cooper, Engineer, Council Offices, Broadway, Wimbledon	do.
Roofing Extension, Tipping Platform, Dust Works	Rothwell U.D.C.	F. Cutler, Clerk, Union Offices, Woolwich	do.
200 Tons of Spalls	Coventry Persev. Co-op. Soc., Ltd.	Market House, Rothwell, Kettering	do.
Shop and Stores, London-road, Coventry	Guardians	Harrison & Hatrell, Architects, 23, Hartford-street, Coventry	Sept.
Building Materials, etc., Cardiff Workhouse	Nottingham Health Committee	A. J. Harris, Clerk, Queen's-chambers, Cardiff	do.
Urinals, Ilkeston-road, Radford, etc.	Yorkshire Inebriates Act Bd. Com.	F. B. Lewis, City Architect, Guildhall, Nottingham	do.
Furnishing Inebriates' Reformatory, Gattai	do.	J. Vickers Edwards, Architect, County Hall, Wakefield	do.
Sluice and Pump Well	Admiralty	G. Smith, Clerk, Horbling, Folkingham	do.
Corrugated Iron Engine-house	do.	F. Sanderson-Robins, C.E., 5, Horncastle-road, Boston, Lincs.	do.
25-h.p. Engine and 30-in. Pump	Wath-upon-Deane U.D.C.	Superintending Engineer, H.M. Dockyard, Portsmouth	do.
New Coastguard Buildings at Howe	Select Vestry	Director of Works Dept., Admiralty, 21, Northumberland-ave., W.C.	do.
New Coastguard Buildings at Barrow-in-Furness	Glasgow Corporation	Supt. Engr., H.M. Naval Estb., Rosyth, near Inverkeithing, N.B.	do.
New Coastguard Buildings at Finess	Stockton-on-Tees Guardians	F. B. Lewis, Surveyor, Town Hall, Wath-upon-Deane	Sept.
Tar Paving or Asphalt (2,000 sq. yds.)	Ryton U.D.C.	Moyan & Gill, Architects, Nenagh	do.
Schoolhouse and Residence, Nenagh, Ireland	Holeworthy Guardians	J. R. Sutherland, Engineer, 45, Jolim-street, Glasgow	do.
800 Tons Cast-iron Pipes	Warrington Paving, etc., Committee	J. Rodman, 16, Tinkle-street, Stockton-on-Tees	do.
Alterations to Children's Homes, Hartington-road	Dublin Corporation	J. P. Dalton, Surveyor, Ryton-on-Tyne	Sept.
Cartage of Road Material	Manchester Rivers Committee	C. Kinsman, Clerk, 12, Chapel-street, Holsworthy	do.
Fire Escapes, etc., at Workhouse	do.	T. Longin, Borough Surveyor, Town Hall, Warrington	do.
Forming and Paving Streets and Passages	Leeds Guardians	City Treasurer, Municipal Buildings, Cork Hill, Dublin	do.
Workmen's Dwellings, Mooney's-lane, Clontarf	Nottingham Public Hks. Committee	Secretary of Rivers Department, Town Hall, Manchester	do.
353,300 Common and Blue Bricks	Ilford R.D.C.	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Ironwork, Valves, etc.	Liverpool Select Vestry	F. G. Webb, Architect, Holly Bush, Lower Machen, Mon.	do.
Electric Sub-station & Subways, Wand, Beckett-st.	Warlington U.D.C.	F. B. Lewis, City Architect, Guildhall, Nottingham	do.
Wiring Install. and Subway, etc., for Hospital Bldgs.	Torquay Town Council	H. Shaw, Surveyor, Town Hall, Ilford	do.
Alterations, etc., Wesleyan Church, Machen	The Corporation	H. J. Hagger, Parish Offices, Brownlow Hill, Liverpool	do.
Public Conveniences, Bulwell Forest	West Ham Corporation	H. W. Stringfellow, Surveyor, Public Offices, Emsworth	do.
Extension of Buildings, Ley-st., Electric Lighting Sta.	East India Ry. Co.	Luke Bell, Highway Surveyor, Town Hall, Settle	do.
Stores	S. Staff. Small-Pox Hospital Board	Borough Engineer, Town Hall-chambers, Torquay	do.
Paving, Emsworth, Hants	Wallasey U.D.C.	J. J. Webster, Engineer, 29, Victoria-street, Westminster	Sept.
Division of 590 lined yds. of Highway, Colgarth Hill	N.E. Ry. Co.	W. J. W. Bullock, Electrical Engr., Electrical Wks., Canning-Town	do.
Erection of Chimney Shaft	Kinsale R.D.C.	W. W. Young, Secretary, Nicholson-lane, London, E.C.	Sept.
Widening Warrington Bridge	Buntingford R.D.C.	G. Green, Town Hall, Wolverhampton	do.
Electrical Equipment of Tramway Track	Commissioners of H.M. Works, etc.	J. A. Crowther, Seaview-road, Liscard, Cheshire	do.
Through Spans (110 ft. in the clear)	Maldens and Coombe U.D.C.	W. Bell, Company's Architect, York	do.
Coal Waggon and Wheel and Axles	Bradford Gas Committee	R. Evans, C.E., 53, Southmail, Cork	do.
Small-Pox Hospital, Bradley, Bilston	Wimbledon U.D.C.	E. G. Thody, Surveyor, Buntingford	do.
High-Tension Switch Gear for Sub-Station	Lancaster Streets Committee	S. Hill, Architect, Green-lane, Reading, Newcastle-on-Tyne	do.
Twenty-three Cottages on Hull and Selby Railway	Southgate U.D.C.	Superintendent of Mercantile Marine, Newcastle-on-Tyne	do.
Additions, etc., to Parcels Office, Hartsells	Worley U.D.C.	District Surveyor, Council Offices, New Malden	Sept.
Public Water Closets, etc., Crosshaven	Edinburgh Tramways Co., Ltd.	do.	do.
383 yds. of 9-in. Pipe Sewer, etc.	King's Norton, etc., U.D.C.	do.	do.
*New Mercantile Marine Office, Newcastle-on-Tyne	Erith U.D.C.	do.	do.
Road Materials	Camberwell Borough Council	do.	do.
Team Labour and Steam Rolling	do.	do.	do.
Ironmongery, etc.	do.	do.	do.
Stores	do.	do.	do.
Making-up Roads	do.	do.	do.
Ramparts Railway (800 yds.)	do.	do.	do.
*Making-up Private Streets, Bowes Park	do.	do.	do.
Farm House, etc., Walla and Crilla, Liskeard	do.	do.	do.
Sewage Disposal Wks., Barton Old Hall Sewage Farm	do.	do.	do.
600 Tons of Cable Ropes	do.	do.	do.
Depot, including Fire Sta., Silver-st., King's Heath	do.	do.	do.
Additions to Elementary Schools, Barnaby-le-Wold	do.	do.	do.
Street Works, Crabtree Manor Way, Belvedere	do.	do.	do.
*Additions to Nunhead Library	do.	do.	do.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be delivered. Lists various construction contracts and their details.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Lists public appointments such as Staffs, Education Committee, etc.

Those marked with an asterisk (*) are advertised in this Number. Competitions, iv. Contracts, iv. vi. viii. x. Public Appointments, xviii. xix.

TENDERS.—Continued from page 250.

RELEON.—For extensions and alterations of ... DEWSBURY.—For paving, bagging, etc., Reservoir-street and Greenwood-street, for the Corporation. Mr. Henry Dearden, Borough Surveyor. Quantities by Surveyor:— Reservoir-street. S. Bedford & Son, Huddersfield-road, Halifax* ... £1,411 1 8 Greenwood-street (part). S. Bedford & Son, Huddersfield-road, Halifax* ... £61 1 6

FEATHERSTONE.—For erecting an isolation hospital, for the Normanton and District Joint Isolation Hospital Committee. Mr. W. Hamilton Fearnley, architect, Station-lane, Featherstone. Quantities by Messrs. G. Connell & Son, Newcastle-upon-Tyne:— A. Lyons ... £16,743 18 6 Walker & Ward ... £14,450 3 10 Salmon & Co. ... 14,350 4 6 G. Clements ... 13,981 0 0 W. Judge ... 13,680 14 9 G. T. Wright ... 13,632 18 8 F. W. Deane ... 13,410 0 0 J. T. Wright ... 13,410 0 0 A. Graham & Sons ... 14,720 18 8 A. Thompson ... 14,618 12 5 J. Pullan ... 14,531 0 0 [Architect's estimate, £12,543 4s. 6d.]

LONDON.—For the erection of a studio at 22, Aubrey-walk, Kensington, for Mr. A. Withers. Messrs. Selby & Kinsbury, architects, 44, Chancery-lane:— B. Colley & Sons ... £840 E. Newton ... £756 Mattock & Parsons ... £251 J. V. Kiddle & Son ... 727 Barrett & Power ... 793 W. Toot* ... 695 LONDON.—For the erection of a factory in Great Allen-street, Whitechapel, for Messrs. S. and H. Harris. Messrs. Selby & Kinsbury, architects, 44, Chancery-lane. Quantities by Messrs. Northcroft, Son, & Nicholson, 9, Regent-street:— Sykes & Son ... £3,932 0 J. Grover & Son ... £3,194 0 J. Willmott & Sons ... 3,628 0 Mattock Brothers ... 3,157 0 W. H. Lascelles & Son ... 825 J. V. Kiddle & Son* ... 3,150 1 0 Co. ... 3,589 0

MANSTON.—For erecting an isolation cottage, for the Isle of Thanet Guardians. Mr. R. A. Harris, architect, 3, Cecil-square, Margate:— E. Padgett & Son ... £735 0 0 Horne & Co. ... £380 0 0 G. H. Pettman ... 717 0 0 Anderson Bros. ... 575 0 0 J. Brown & Son ... 700 0 0 G. Miriams ... 500 0 0 W. H. Boucher ... 665 0 0 A. E. Good-bourne ... 490 0 0 Huckell & Grim-bury ... 637 3 0 G. Gray ... 475 0 0 C. G. Townsend ... 635 0 0 E. Yeates ... 445 16 8 Woodhall & H. Noble, St. Son, Ltd. ... 588 10 0 Peters* ... 395 0 0 A. Dyke ... 587 8 0

NORMANTON.—For road-making and drainage, Normanton and District Joint Isolation Hospital. Mr. W. Hamilton Fearnley, architect, Station-lane, Featherstone. Quantities by Messrs. G. Connell & Son, Newcastle-upon-Tyne:— E. Leake & Sons ... £1,630 0 0 Barker & Co. ... £967 3 0 M. Hall ... 1,281 4 9 G. M. Kerry & Co. ... 950 0 0 J. Rodger & Sons ... 1,207 10 7 G. Clements ... 913 5 7 E. Rogers ... 1,132 1 3 Featherstone* ... 938 8 3 J. Brook ... 1,077 7 8 A. Yeates ... 1,012 18 10 W. Morley & Sons ... 1,012 18 10 [Architect's estimate, £997.]

NORWICH.—For erecting an octagonal brick chimney at the City Asylum, Halesdon, for the Corporation. Mr. Arthur E. Collins, City Engineer, Guildhall, Norwich:— J. W. Oray & Co. ... £479 0 0 Alphons Custodis Chinnery Construction ... £448 0 0 Downling Bros. ... 449 15 0 Co. ... £418 0 0 Alexander, Nevins, & Co. ... 444 0 0 M. Warrington ... 430 0 0 Neil & Co. ... 431 11 0 Youngs & Son ... 369 19 9 A. D. Boddy & Son ... 420 0 0 J. S. Smith ... 366 0 0 A. S. Lincoln ... 363 0 0 W. J. Hannant, Churchhill-rd., Norwich* ... 358 0 0 [Architect's estimate, £297.]

NOTTINGHAM.—For erection of a pair of villas, in the Rise, Nottingham. Messrs. A. H. Calvert & William R. Gleave, architects, 18, Low-pavement, Nottingham:— W. & J. Simons, Nottingham* ... £830 [Lowest of eight tenders.]

PORT TALBOT.—For erecting shop and premises, stables, and outbuildings, for Mr. Rees Evans. Mr. Frank B. Smith, architect, Port Talbot:—
J. Davies £1,140
M. Cox, Port Talbot* 1,125

ROCHESTER.—For alteration to Delee Grange and erection of coals and wood lodge and two water-closets, for the Wardens of the Rochester Bridge. Mr. E. J. Hammond, surveyor, Balmoral-road, Gillingham:—
G. Baker, High-street, Strood* £151 10 0

ROCHESTER.—For repairs and repainting to exterior of Delee Grange, Upper Washenden Farm, and Bridge Chamber, Rochester, for the Wardens of the Rochester Bridge. Mr. E. J. Hammond, surveyor, Balmoral-road, Gillingham:—
H. Hollis, Strood and Brompton* £117 10 0

SCUNTHORPE.—For cast-iron pipes, etc., for the Urban District Council. Mr. A. M. Cobban, engineer, Scunthorpe. Quantities by engineer:—
W & S O B, A. G. Cloake £4,343 11 6
Cove. & Co. £5,216 9 4
Holwell Iron Co. 4,428 6 7
H. Hall 4,389 15 4
Stanton Iron Co. 4,375 0 0

SITTINGBOURNE.—For laying out building estate, sheerness, for Messrs. Vallance, of Sittingbourne, Kent. Mr. E. J. Hammond, surveyor, 21, Balmoral-road, Gillingham:—
G. Anger, Chatham and Herne Bay* £520

STAFFORD.—For erecting new elementary schools, etc., St. Leonard's-avenue, for the Education Committee. Mr. H. T. Sandy, architect, 22, Greengate, Stafford:—
G. L. Mulhead £10,094 0 0
A. White & Sons 9,531 0 0
J. Dallow & Sons 9,400 0 0
A. J. James & Pemberton. 9,175 0 0
C. J. Novitt. 8,900 0 0
F. L. Jones. 8,734 0 0
Young & Son 8,700 0 0
T. Lowe & Sons 8,677 0 0
Pezz & Bailey 8,647 0 0
H. Gough. 8,580 0 0
J. Hodges 8,560 0 0

STRATFORD.—For new premises, for Messrs. Williams & Thomas. Messrs. George Baines & R. Palmer Baines, architects, 5, Clewley's-inn, Straud, London, W.C.:—

Shurnpur & Sons, Ltd.	Estimate A. £7,083	W. Wallis £5,009
T. H. Kinglerie & Sons 7,177	G. J. Hosking 5,977	F. & H. E. Higgs. 5,947
F. Gough & Co. 6,491	W. Stothorpe 5,797	Battley, Sons, & Co. 5,797
Coulson & Lofts .. 6,267	C. North, Grove Works, Maubey-road, Stratford, E.T. 5,620	
H. L. Holloway .. 6,190		
L. Grover & Son .. 6,182		
Kerridge & Shaw. 6,177		
Patman & Potheringham 6,177		

* Accepted with modifications.

SUTTON (Sarrey).—For alterations and additions to a part of the late South Metropolitan District Schools as a first section of the Belmont Asylum for Imbeciles, for the Metropolitan Asylums Board. Messrs. Thomas Dinwiddie & Sons, architects, Parkhurst-street and Greenwich. Quantities by Messrs. R. L. Curtis & Sons, Finsbury:—
Eames Bros., Erith* £15,730

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TIPTON.—For construction of manholes and cast-iron pipe sewers under the Birmingham Canal at Toll End, for the Urban District Council. Mr. W. H. Jakes, Surveyor, Public Offices, Owen-street, Tipton:—
H. Hughes & Sons £490 0 0
C. Smith 320 0 0
E. Boore 245 10 9

[Surveyor's estimate, £245 6s.]

WARRINGTON.—For alterations to Stockton Heath swing-bridge over Manchester Ship Canal, for the Corporation. Messrs. Preece & Cardew, engineers, 8, Queen Anne's-gate, Westminster, S.W.:—
Sir W. G. Armstrong, Whitworth, & Co., Ltd. £229
G. Thompson & Co. 172

WHALEY BRIDGE.—For steelwork for bridge over the river Goyt in Bridge-street, for the Yeardeley-cum-Whaley Urban District Council. Mr. C. R. Brady, engineer, 13, Warren-street, Stockport:—
Trafford Park Steel Co., Liverpool* £232 4 0

WHALEY BRIDGE.—For demolishing old bridge and erecting new over the river Goyt in Bridge-street, for the Yeardeley-cum-Whaley Urban District Council. Mr. C. R. Brady, engineer, 13, Warren-street, Stockport:—
Scathergood & Sons, New Mills* .. £275 10 0

WINCHESTER.—For alterations to shop front and premises, 1, High-street, for Messrs. Hillier & Sons. Messrs. Colson, Furrow, & Nisbett, architects, 45, Jewry-street, Winchester. Quantities by architects:—
G. White £215 0 0
H. Douilly 206 14 8
J. J. Wise 198 0 0
F. Bancroft 198 0 0
Bagshaw & Son. 189 0 0

WROUGHTON, WILTS.—For alterations and additions to the Three Tuns Inn, for Messrs. T. & J. Arkill. Messrs. W. Drew & Sons, architects, Regent-circus, Swindon:—
E. Cowley, Wroughton* £282 5 0
[Four Tenders received.]

WORKMEN'S HALL, NEW TREDEGAR.—In the list of Tenders for this work in our last issue the name occurs of "Cassmore & Perkins." It should have been Passmore & Perkins, Ynysyddu. The mistake was not ours.

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VOL. LXXXVII.—No. 3214.

SEPTEMBER 10, 1904.

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Haggerston Public Baths.....	Mr. A. W. S. Cross, F.R.I.B.A., Architect.
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The Church of Prittlewell.



THE Church of St. Mary, of Prittlewell, is by far the most important building in the Hundred of Rochford, which occupies the south-eastern corner of

Essex, and is rightly considered to be one of the finest churches that the county possesses.

There was a church here at the time of the Domesday Survey which was evidently one of some importance in pre-Norman days. The entry pertaining to it is of an unusual character, for it states that "to the church of this manor thirty acres of another estate were added by two men."

The Priory of Prittlewell was founded by Robert of Essex for the residence and support of Cluniac monks in the 11th century; it is usually said, *temp. Henry II.*, but it was more probably first founded in the reign of Henry I. The priory stood a little distance to the north of the parish church, and was quite independent of it. It is necessary to say a few words as to the priory, of which there are practically no remains extant, as the parish church is sometimes assumed to have been that of the Cluniac monks. Contrariwise it would have been quite irregular for them in any shape or form to serve it, although the rectory and great tithes of Prittlewell, in conjunction with those of several other parishes,

were conferred on the priory about the time of its foundation. The parish church was served by an episcopally instituted vicar; no monk could have held the vicarage save by special dispensation.

Although Prittlewell Priory had a considerable endowment, which was at its own disposal, it was but a cell of the important priory of Lewes, which was the leading Cluniac house in England. It had no full conventual rights of its own, for the priors of Prittlewell, right down to the days of the Dissolution, were always nominated by the prior of Lewes instead of being elected by their own monks. Prittlewell had to pay a mark of silver to Lewes every recurring feast of St. Pancras as a token of subserviency, but save in this respect and the appointment of prior it seems to have been allowed to administer its own affairs. When the commissioners of the Abbot of Cluni visited Prittlewell in 1276 (the Cluniac houses were visited every three years) there were fifteen monks. The visitors three years later found fourteen monks "living good and regular lives, observing the rule of their order, and properly conducting the Divine offices"; they reported that the prior had just had to rebuild his church, but that the other conventual buildings were in good repair. At a visitation of the next century it was found that the monks numbered twenty-four; their church must have been of considerable size, as there were four daily masses.

The foundation charter of the priory names the parish church of Prittlewell first among a variety of gifts, and states

that this grant included everything in land and tithes that was held by the three priests of Prittlewell. These three priests were probably those who served the mother church of Prittlewell, and the two churches of Sutton and Eastwood, which were then parochial chapels.

The church of St. Mary is finely proportioned and consists of chancel with south chapel, nave with south aisle, south porch, and western tower. The interior dimensions of the chancel are 37 ft. by 23 ft. 6 in.; of the Jesus chapel, 24 ft. 10 in. by 19 ft. 3 in.; of the nave 98 ft. 10 in. by 23 ft. 6 in.; and of the base of the tower 15 ft. by 14 ft. 6 in. The interior measurement of the porch is 9 ft. 10 in. by 9 ft. 4 in., and the parvise over it 11 ft. 6 in. by 11 ft.

There was a church here of some importance, as has been already remarked, in Saxon times. In the north wall of the chancel, which is a somewhat puzzling and complex structure of differing dates, half of a round-headed archway turned in Roman tiles may be noted. There is a strong presumption that we have here a remnant of the pre-Norman church.

There was evidently a considerable enlargement or rebuilding of the parish church of Prittlewell in the earlier Norman days. This would most likely be accomplished by Richard of Essex at the time when he founded the adjacent Cluniac Priory. It is possible that the work then accomplished consisted in the adding of a large Norman nave to the hitherto small Saxon church, the latter being utilised as a chancel.



Prittlewell Church : View from South-east.

This church underwent a strenuous restoration in 1871, at the hands of Mr. Christian; it was re-opened for service on April 4, 1872. During the progress of the work three round-headed Norman windows were opened on the south side of the nave, which had given light to the church before the south aisle was built.

This aisle was first thrown out early in the XIIIth century, as is shown by the construction of the three pointed arches supported by massive piers at the western end of the nave. The arcade between the nave and south aisle consists of six bays, but the three arches nearest the east end are of undoubted XVth century work, and supported on very light octagonal piers. Above these three arches, and in the corresponding space in the raised north wall of the nave, clearstory lights have been inserted.

The story of this alteration is fairly easy to read. About the time of Edward IV. (1461-1483) the parish authorities, in conjunction, doubtless, with the prior of Prittlewell, resolved on a handsome reconstruction and enlargement of the church. The tower was then built, the south aisle enlarged, a south porch built, and the chancel with the south chapel reconstructed. To give more grace to the interior of the church it was resolved to rebuild the south arcade, particularly as the XIIIth century arches had been pierced through the Norman walling after a somewhat clumsy fashion. But this work was never finished; it began at the east end,

and when half done came to an abrupt end, probably through failure in funds. Hence arises the singular contrast between the western and eastern halves of this arcade as it now stands. A particularly handsome piece of work that was then accomplished was the embattling of nave, aisle, chapel and chancel in chequered work of alternate squares of stone and flint.

The windows and buttresses of this church throughout are of late XVth century style, though there are traces on the north side of certain alterations of the XIVth century. The tracery of a three-light pointed window of the nave near its east end is obviously XIVth century work, but it was renewed during the 1871 restoration, and we could not ascertain whether or no it is a reproduction of its predecessor.

It is fortunately possible to date with some precision not only the building of the tower but of the interesting Guild Chapel at the east end of the south aisle. Thomas Warde, by will of 1469, directed Agnes his wife to pay 3s. 4d. towards the building of the south aisle. The word aisle was not infrequently used at this period for what we generally term a chapel, and this was probably a bequest to the extension of this aisle to form the Jesus Chapel. John Hoke, of Prittlewell, desired by his will of 1505 to be buried in "the new Ile of Jhu," and bequeathed to it 40d. There was an old-established guild or fraternity of Jesus in connexion with this parish, possessed of a considerable

endowment, and re-established on improved basis in the time of Edward IV. The Jesus priest acted as assistant priest or curate to the parish, and was also schoolmaster; but school and were swept away by the legislation of Edward VI. The chantry roll entered prior to its confiscation, put its annual value at 7*l.* 1*s.* There were "T. wardens, one master, one priest, a certaine bretherne and sisterne therto to finde a priest called Jesus priest ever by license of King Edward the first Fowerthe. And one Sir William Redbothum, clerke, of the age of fifty-three yeres, of honest conversation, a teachithe a scole their, having no other lyyunge, is now incumbent thereof. The seid priest singithe within the sa church of Pritwell."

The south porch is of good construction but sadly overweighted with exuberant ivy, which is already working mischief on the south and east sides. The square-headed windows on each side are brickwork. There is a projecting stair turret in the west angle of the porch to give access to the upper room or parvise doorway into it is within the church. The south door within the porch is a fine, well-carved example of XVth century woodwork in excellent condition; it has a good latch-ring, as well as a large closing-ring, often, but quite mistakenly termed a "sanctuary" ring.

The most striking feature of the church is the exceptionally fine western tower of greystone. It is of four stages

d is supported by diagonal buttresses four set-offs, which reach to the top of the third stage. A good and unusual effect is produced by the angles of the permost stage above the buttresses being boldly chamfered. The battlements, which are ornamented with a squere of flint and stone, rise from a slightly corbelled stringcourse. At the angles are octagonal battlemented pinnacles, which are crowned with richly decorated finials.

There is a good west doorway to the tower, with squared hood-mould and pinnacles in the spandrils; there is no large left on the south of these shields, but on the north bears a Latin cross. Immediately over the doorway runs a band of chequered work. Above this is a three-light pointed Perpendicular window, the tracery of which has been preserved. On each side of this window, at a level with the spring of the arch, is a small image niche, deeply recessed. There is also a projecting image bracket about 5 ft. from the ground, on each side of the west doorway. On the north and south faces of the tower there is a single deeply-recessed image niche immediately above the centre of the west stringcourse. There are small single-light windows on the four sides of the third stage, though that on the north side is concealed by a clock-face. The bell-chamber windows are of three cinquefoiled main lights under somewhat recessed arches. Any sound student of English architecture would be inclined to date this tower about the middle of the XVth century. Documentary evidence shows that such a surmise is correct. The tower, which was probably long time in building, was approaching completion in 1469. In that year Thomas Warde, yeoman, of Prittlewell, by will 6s. 8d. towards the construction of the pinnacles of the tower of the parish church. Another benefactor the same year left 40s. by will for a like object.

Against the lower stage of the south side of the tower four corbels, that were formerly supported a lean-to building of some size, may be noted. From this turret there was a doorway into the church at the west end of the south aisle. At this building was a chantry house for the priest of the Jesus Guild is a likely supposition; it was here probably that he held his school.

The tower has for a long time been celebrated for its fine ring of bells. In 1840 it enjoyed an unenviable reputation owing to the fierce disputes, involving the production of pistols and knives, between the vicar (Dr. Nolan) and the parishioners, which ended in legal proceedings. These happier times the ring has been ceased from eight to ten bells, in honour of Queen Victoria's jubilee.

The font is one of unusual construction, of peculiar interest. It is of octagonal shape and 2 ft. 7 in. in diameter. Six of the concave sides or panels bear sculptured ornaments. The panel facing east bears a rood, which is now much decayed; other panels have respectively a Tudor rose, a half rose, a dimidiated rose and a pomegranate, a chevron between a fleur-de-lis, and the unusual, if not unique, design, at this date, of a heart between two spears in saltire, which was

probably intended as a symbol of the Passion. The coat of arms most likely represents the family of the donor, but it is almost hopeless to attempt its identification without the tinctures, for a chevron between three fleur-de-lis was borne by so many families; perhaps it may be for Fansbawe, who had extensive Essex possessions about this period.

This font is obviously towards the end of the third pointed or Perpendicular period. The cognisance of the conjoined halves of a rose and pomegranate helps, however, to assign a more precise date. This combination of the Tudor rose and the pomegranate of Aragon points to that fateful and irregular marriage, fraught with immeasurable consequences to England, the cause (humanly speaking) of the Reformation and the breach with Rome. On November 14, 1501, Henry VII.'s eldest son Arthur, a lad of fifteen, was married in St. Paul's Cathedral to Catherine, the seventeen-year-old daughter of Ferdinand and Isabella, the sovereigns of Aragon and Castile. Prince Arthur died in April, 1502, and in June, 1503, his widow was betrothed to his brother Henry, then barely twelve years of age. The marriage ceremony did not, however, take place till June, 1509, when Henry VIII. was united to Catherine of Aragon at St. Paul's, and crowned at Westminster Abbey. The date of this font is probably just after the accession of Henry VIII., before he had begun that career which made him, as has been cynically observed, "a professional widower."

On the west side of the pier of the arcade nearest to the tower is a small niche, which may have served as a depository for the chrysmatory, or vessel with the holy oils which were used at baptism.

To the north side of the altar of the Jesus chapel is a large mutilated image niche, that has had a groined canopy and projecting bracket. There can be little or no doubt, judging from analogous cases, that here stood a large figure of Our Lord, with the orb in his left hand, and the right hand raised in blessing.

The monuments of this church, are unusually few. In the north-west angle of the nave is reared up a large early XIIIth century stone grave-cover with chamfered edges, and a cross in relief; it was found during the restoration.

On the north side of the church, near the pulpit, is a boldly lettered mural tablet of alabaster and coloured marble, of curious orthography, which is thus inscribed:—

"Here lieth buried Mary Davies the wife of Richard Davies (the sonne of John Davies the elder of Middleton in the County of Salop Esq.) Esq. of the Body Extraordinary unto his Majesty. Shee was the eldest daughter and heire of Richard Cocks of this parishes Esq. the sonne of John Cocks Esq. by Elizabeth his wife, one of the daughters of the Right Honorable Thomas Lord Wentworth Lord Chamberleyn to King Edward the 6. Shee departed this life without issue borne one the 2 day of September Anno 1623."

In a circular frame above is a shield bearing four quarters of Davies impaling quarterly of Cocks. The crest is a boar passant, collared; the pig is somewhat clumsily carved, and by one heraldic note-taker has been turned into a hippopotamus! A grant of arms was

made in 1587 to John Cocks, of Prittlewell, grandfather of Mary Davies.

The east window of the Jesus chapel is filled with most valuable and highly interesting stained glass, to which a romantic interest is attached. About the close of the XVIIIth century, during the terrible troubles that afflicted France, an Englishman purchased the coloured glass of the south-west window of the noble church of St. Ouen, Rouen, to save it from destruction. This glass, carefully packed away in cases, remained in a cellar near Colchester almost forgotten for about seventy years, in the possession of the Neave family. Soon after the incumbency of the present vicar began (Rev. T. O. Reay, 1880), to whose assiduous care the present good condition of this fabric is so much indebted, this foreign glass was placed by Lady Neave in this window to the memory of Sir Arundell Neave, Bart., who died in 1877. Glass experts put the date of this series of glass pictures, twelve in number, between 1500 and 1540. Some of the designs are exact reproductions of the drawings of Albert Durer. They all illustrate scenes from the Old and New Testaments. The latest, which does not harmonise with the rest, is the Blessed Virgin and Child in a handsome Renaissance border. The most striking of the Old Testament scenes is the death-bed of David, with the crowning of Solomon on a smaller scale in the background. The picture of "Behold the Lamb of God," on the banks of the Jordan, is a fine composition and beautiful in detail. It is somewhat curious that this excellent and interesting glass escaped notice by Mr. Lewis Day in his recent work on "Stained Glass."

In this chapel there is a handsome large panel of Jacobean carving which forms the front of a case for altar frontals, but it has no ancient connection with the church, having been purchased and put to its present use by the vicar.

In the churchyard are a large number of window mullions and other moulded stones discarded during the too vigorous restoration of 1871-2.

INVENTIONS AND THEIR NOVELTY.



THE Patents Act of 1902 embodied two highly important amendments of the Patent Law, the one relating to compulsory licences and the other to the examination of the novelty of inventions on applications for patents. The first amendment relating to compulsory licences has already come into operation, while the second amendment relating to the examination of the novelty of inventions is, by an order of the Board of Trade just published, to come into operation on January 1 next. On and after that date all applications for patents upon which complete specifications have been filed will be subjected to an examination for the purpose of ascertaining whether the invention claimed has been wholly or in part claimed or described in any specification of an English patent published within fifty years next before the date of the application. The expert examining staff has been largely increased in view of the additional work thus rendered

necessary; the new procedure will affect all applications for patents that reach the "complete specification" stage, and each specification will be examined for the purpose of ascertaining whether the invention has been either wholly or in part described or claimed in any previous specification, other than a provisional specification not followed up with a complete specification, published in this country during the fifty years next preceding the date of the application. The official search will be conducted amongst the classified specifications and abridgments which have been prepared to cover the period beginning in 1855. In the spring of last year the Comptroller-General visited Berlin to see the methods adopted in Germany for pursuing inquiries into novelty, and he also caused himself to be informed of the system which has been adopted by the Patent Office of the United States.

This amendment of the law cannot fail to have a substantially beneficial effect. Until now, the examination at the Patent Office has been strictly confined to formalities, and it has always been open to an inventor to make any claims he might choose, without regard to their novelty; so that thus it has always been a matter of some difficulty to determine exactly what an inventor was justly and properly entitled to. By the institution of an examination as to novelty of an inventor's claims, this anomaly will be largely remedied, and it will only now be possible for an inventor to make such claims as are justified in view of the state of the art at the time he files his application. The result of such an examination would obviously be no guarantee as to the novelty of an inventor's claims, for the examination prescribed is strictly confined to the English Patent records. Any anticipations of an invention that may have been previously published in scientific and technical papers, or in the records of scientific and technical societies, will not come into question. Neither will any anticipations contained in the specifications of prior foreign patents published in this country before the date of an application here. So that thus the grant of a patent under the new conditions will hardly be a conclusive guarantee of the novelty of the invention or of the validity of the patent granted; and, in point of fact, this is specially provided for in sub-section 9 of section 1 of the new Act, which prescribes that the examination shall not be held in any way to guarantee the validity of any patent, and that no liability shall be incurred by the Board of Trade in connexion therewith. But still an examination, restricted as it will be to the English Patent Records, will be of considerable public advantage, for it will certainly render impossible the protection or the re-patenting of old inventions; and, having regard to the fact that the English Patent Records are fairly representative of the progress of the manufacturing arts, the result of the search may be taken as *prima facie* evidence of the novelty of the claims that are allowed having regard to it.

Although the examination prescribed under the new law is thus not thorough and conclusive, yet it undoubtedly will,

to a very large extent, effectively serve the purpose of preventing flagrant impositions upon the public in the exploitation of old inventions. In accomplishing this purpose, the procedure provided by the new Act will be particularly useful, inasmuch as the Comptroller of Patents will have power to order in the complete specification filed on an application for patent a reference to the specifications of any prior English patents that describe or claim any part of the invention claimed by the applicant; so that thus a notice will be given to the public in the applicant's own specification as to the limits of his invention, having regard to the prior English patents. The Act, however, provides that the applicant may amend his specification to avoid the prior patents that may be cited in anticipation of his claims, and the power to order a reference to the prior patents is only enforced in event of the failure of the applicant to properly amend his specification and claims having regard to them; so that thus no hardship is ordinarily likely to result in the insertion of these compulsory references.

It is to be observed that under the new law no examination as to novelty will be conducted on a mere application for provisional protection, but the period of nine months' provisional protection hitherto granted will, on and after January 1 next, be reduced to six months, in order to permit of the examinations being completed for the applications to be accepted within the statutory period of twelve months from the date of the application, according to the existing law.

The present proposals, it must be admitted, do not compare favourably with the examinations as to novelty of inventions adopted in other important countries of the world, such as the United States and Germany. In both these countries, for example, the examination extends to all the published Patent Records of all countries, and to all available information published in the text-books, periodicals, and transaction of scientific and technical societies in all the principal countries of the world. It is, however, doubtless impracticable, even if it were advisable, at once to establish in England a more extensive examination approximating to that in vogue in the countries mentioned; but the restricted examination now prescribed is a reform that can easily be developed step by step until it is practicable for the Patent Office to conduct a rigorous and exhaustive examination in regard to the novelty of all inventions submitted for protection; so that thus reliable testimony may be afforded, by the grant of a patent, that the novelty of the invention has been proved.

GUILDHALL, DEVONPORT.—Repairs and re-decorating, and some structural alterations, are to be carried out at the old Guildhall at Devonport, which has been for some time in a rather dilapidated condition. The interior and exterior are to be painted, old paintings taken down and cleaned and the frames regilt, and some alterations are to be made in the jury boxes in order to render the courtroom more commodious. The work will be carried out by Messrs. R. W. Pitcher and Sons, at a cost of 4287, under the supervision of Mr. J. F. Burns, the Borough Surveyor.

NOTES.

Hampstead Heath.

It is very gratifying to find that the money has been collected to enable the Hampstead Heath Extension Committee to purchase the 80 acres of Wyld's Farm, near the intended station of the Tube railway, so as to prevent the portion of the Heath from becoming, if it undoubtedly would have become, a collection of streets and small houses in the vicinity of the railway station. The collection of the money in time to secure the purchase has, however, only been brought about through the trustfulness and generosity of various persons of means who have guaranteed, in sums of from 500. to 5000., the amount of the 4,000 necessary to make up the purchase money. Londoners ought to feel greatly indebted to those who have thus come forward to save the scheme when no time was left for further collection from the general public; but it should be remembered that they expect to be, and ought to be, repaid, and that therefore it is still the duty of those who enjoy Hampstead Heath to give their aid, as each can afford, towards wiping out a debt to those who have trusted in the public to repay them. The land purchased eventually to be transferred in perpetuity to the London County Council.

Continuing the work which has been cut off the Isle of Wight from the mainland.

the sea now threatens to separate the north-west corner of the island by forming a channel from Freshwater Bay to the valley of the River Yar, which enters the Solent at Yarmouth. Although the cliff between Freshwater Bay and the Needles rises to a height of nearly 500 ft., the bay itself lies in a dip of the coast line. Years ago the adjoining land was protected by a concrete sea-wall, but a large portion of this was destroyed during heavy weather in February, 1899. No attempt has been made to restore this wall, and as a natural consequence, a considerable fall of cliff has taken place, a road has been washed away, and, as stated above, the sea now threatens to break through to the Yar valley. From a recent Local Government Board Report, it appears that the position is one of some gravity, and that, unless prompt measures are taken, Totland and Freshwater may soon be cut off from the rest of the island.

No doubt exists as to the nature of the remedy for the present state of affairs; the only trouble is that the local authorities are unwilling to incur the expense of protecting the lands under their jurisdiction, and suggest that the burden should be laid entirely on the inhabitants of Freshwater. The Local Government Board, in forwarding their report, tries to smooth away difficulties by suggesting that a contribution might be obtained from the Hampshire County Council. How long the local authorities will continue to bargain no one can predict, but one thing seems to be certain, that, unless haggling soon gives place to action, a good slice of the rate-payers' area will be eaten up, and serious damage will be done to the new sewage works on which thousands of pounds are being spent.

NOTWITHSTANDING the sadly-changed aspect of its lower reaches, the River Lea maintains its popularity as a pleasure ground among the inhabitants of East Essex, Essex, and Hertfordshire. Early times the river was of far greater importance, for old writers tell us that it was once navigable by ships as far as London. Lambarde says:—"It hath long tyme borne vessels twenty myles up the head, for, in the tyme of King Alfrede, the Danes entered Leyland, whence King Alfrede espied the channell of the ryver might be such sorte weakened that they should not be able to returne. He caused, therefore, the water to be abated by two trenches, and setting the London-ship upon them, he made their battell, in which they lost four of their captains." These Danes had doubtless taken their ships to the fort constructed upon the present site of Ware, protected by the "weare," which bears its name to the town. By the time of King Alfrede, the waters were retarded and the Danish ships left high and dry. In more recent times, the river has played a part in connexion with the defence of London, for in *The Times* of September 5, 1804—a time when Napoleon was preparing for the invasion of England—it is recorded that Rennie, acting under instructions from the Duke of York, constructed a singular floating battery at the Four Mills, Bromley, for the purpose of "sustaining the water at the level of high water," apparently the object of placing an obstacle in the way of an invading army. The battery consisted of a vessel which could be sunk, by means of a valve in the bottom, so as to fit a groove formed in the bottom of the river. On the completion of this defensive work was ordered by the Duke of York, Mr. Rennie and several well-known military engineers, who afterwards rode up the river to observe the effect produced, as the "fishing house"—probably the White Hart at Temple Mills, a house frequented by anglers in the East-End. As reference is made to the operating sluices at Stratford, and the Ham Bridges, the Temple Mills, and Lea Bridge," it is clear that the sluice-gate influenced the various channels of the Lea across the marshes, and not the Navigation Cut, constructed about 1772, which gives free communication from Lea Bridge to the meadowhouse. In the present day our opinions upon the subject of defensive works differ as much from those of a few years ago as from those of the time when good King Alfrede reigned in England.

MORE than twenty years have elapsed since an exhibition fully representative of the gas industry in all its branches has been held, and so many changes and improvements have since taken place in the methods of using gas for lighting, heating, cooking, and power purposes that the Institution of Gas Engineers, in co-operation with the leaders of the gas industry on the Continent and in America, has decided to open an International Gas Exhibition at Earl's Court, London, in

November next. The exhibition is to remain open from November 19 until December 17, and is to serve as an object-lesson for the general public as well as for architects, municipal engineers, and surveyors. The best methods of using gas for street-lighting, for lighting public halls, shops, and private dwellings, and for heating and cooking will be shown. It is also intended that the exhibits shall include models of artisans' dwellings supplied with gas by the prepayment system, and models of apartments used by professional men, merchants, shopkeepers, and private householders, suitably fitted with gas-consuming appliances. Arrangements will be made for the delivery of cooking lectures, with practical demonstrations, as well as for scientific and popular lectures, and prizes are to be offered for artistic gas fittings. The exhibition will be registered under the Patent Acts, for the encouragement of inventors, who will be invited to exhibit models and drawings of their inventions. It is proposed to divide the exhibits into the following seven groups:—
 (1) Lighting. This group will include all kinds of burners, brackets, and lanterns for all descriptions of lighting; (2) cooking and heating; (3) motive power, showing gas applied for pumping, ventilating, printing, driving dynamos, etc.; (4) gas applied to industrial purposes, showing appliances for traction, japanning, lacquering, enamelling, brazing, etc.; (5) science in relation to the gas industry—exhibits to include photometers, calorimeters, pyrometers, leakage detectors, etc.; (6) residual products; (7) engineering in connexion with gas manufacture, distribution, and measurement. The Advisory Committee is remarkably well constituted for the task it has to perform, and we have little doubt that the exhibition will be a success, but we would suggest that when adjudging the competitions for "artistic" fittings the judges appointed should be men who command respect as artists.

In the case of *Robins v. Goddard* Mr. Justice Farwell had to consider the rights of parties under a building contract which was in the form sanctioned by the Institute of Architects. The architect had given his certificates as the work progressed, and the contractor was suing the building owner on those certificates, which embraced the whole of the work, including extras. The defendant admitted the amount due under those certificates, but counterclaimed against the contractor for defective work and materials, and relied upon a clause in the contract which provides that "No certificate of the architect shall be considered conclusive evidence as to the sufficiency of any work or materials, nor shall it relieve the contractor from his liability to make good all defects as provided by this contract." The construction the Court put upon this clause was that it operated to prevent the certificates given by the architect during the progress of the work from being set up against the powers conferred upon the architect by the contract (clause 17) to order certain defects to be made good within a specified time of the completion of the works; but it was of no

use as a defence to this action, since the architect had given no direction as to any defects after the completion of the contract, nor made any order by whom the cost of making them good should be borne; and in consequence the action appeared to be almost an undefended one.

We have received from the Engineering Standards Committee an interim report containing "British Standard Tables of Copper Conductors and Thicknesses of Dielectric." We are informed that the tables published in this report are in their final form. We think that some of the ten resolutions arrived at could have been expressed more clearly, and a few more resolutions might have been added in order to explain the subsequent tables. For example, no definition is given of what is meant by the "lay" of a wire; and thus resolution 9, which states that "a lay, involving an increase of 2 per cent. in each wire, except the centre wire," really means something very different from what we imagine the Committee had in their minds. We also wonder, seeing that "lay" is mentioned, why "spiral" is not also mentioned. The latter is all-important in connexion with three-core cables. On p. 10 it is mentioned that the standard armoring for cables above 2 in. in diameter is to be "two layers of compounded steel tape," each 60 mils in thickness. The weight of this armoring will be many tons per mile, and as the iron surrounding two and three core cables is magnetised by the currents in the cores the eddy current and hysteresis losses will be large. Galvanised iron wires would form a far more suitable armoring, and we were glad to note recently that this armoring is being largely adopted in connexion with the mains for the new underground railways in London. The test pressures in this report are specified in a very unscientific manner. On p. 10 we read that "all test pressures may be applied either with alternating or direct current, the former to be at the standard frequency." We thought that it was well known that all insulating materials withstand much higher direct pressures than alternating pressures. The "Compagnie de l'Industrie Electrique et Mécanique" of Switzerland have recently published an exhaustive series of tests which prove conclusively that a material which will withstand a direct-current pressure of 24,000 volts will break down with 15,000 volts alternating. This is in entire agreement with our experience. In conclusion, we note that the Standards Committee have divided cables into "large sizes," "intermediate sizes," and "small sizes," and that, for example, a cable containing thirty-seven strands of wire, the gauge of which is apparently No. 14, may have a cross-sectional area of 0.2 or 0.18 of a square inch, depending on whether it is a "large" size or an "intermediate" size. No hint is given as to how the cross-sectional area will vary with the "spiral" of the core of a cable.

In the form of an "Interim Report" the Engineering Standards Committee have issued a final specification for tubular

Tramway Poles.

tramway poles, the settlement of which has been attended with more difficulty than was at first anticipated. It appears that the draft specification prepared by the Committee failed to meet with the approval of the makers, and that the various points of difference were not settled until they had been thoroughly discussed at a conference held at the Institution of Civil Engineers in June last. The standard specification provides for three classes of pole—light, medium, and heavy—and for two methods of construction, the overall length for all poles being fixed at 31 ft. One method is to make the poles in three lengths, or sections, either of solid drawn or of lap-welded steel tube, the diameters being such that the sections can be connected by telescopic joints, swaged together when hot. The other method is to make the poles of steel plate, rolled in one length and butt-welded the entire length. Outside diameters are specified for the three classes of pole in each of the two types, and the minimum thickness of metal is fixed at $\frac{1}{4}$ in. Drop and bending tests of simple but sufficiently severe character are prescribed for application to 5 per cent. of the poles supplied, and if one pole should fail to pass the tests a further 5 per cent. is to be examined, and the failure of one other pole will render the whole delivery liable to rejection. The specification seems to be particularly simple, but it should be observed that the selection of a pole suitable for any given duty is left entirely to the discretion of the responsible engineer.

The Motor Dust Problem. WRITING to *The Times* on August 31, a correspondent suggests that, in the interests of ratepayers who now "see their money literally hewn, scraped, and shovelled away," the dust nuisance should be dealt with at its source, by the adoption of materials such as are used on the Nottingham and Grantham main road. The materials in question really form a special type of tar macadam, which we mentioned in our "Note" of August 27, as capable of affording relief from the dust nuisance. Mr. E. P. Hooley, the County Surveyor of Nottingham, is responsible for "the grand stretches of dustless, mudless roads" cited by the writer of the letter to our contemporary, and it may interest our readers to hear that tar macadam has been used throughout the highways of Scarborough for many years, and by various towns in the Midlands. The Glasgow Corporation have also adopted the same material in place of cobble paving and ordinary macadam. Unfortunately, very little has been attempted in the South of England in the way of reform, but there are at last some evidences of awakened interest in this direction. The Croydon District Council have recently laid two short lengths of Hooley's patent tar macadam—one opposite the Vestry Hall, Mitcham, and the other near Hackridge Station. We have inspected the former of these examples during dry weather, and also immediately after the heavy rains of last week, and find the surface to be absolutely dustless and mudless. Further, we may refer to the highly satisfactory

results following the application of gas tar to a portion of the Reigate-road, close to Banstead Downs. While riding along this stretch a few days ago, we were passed by a motor-car which failed to raise the slightest trace of dust, although when entering upon the ordinary macadam beyond, the same car was immediately lost to sight in a dense cloud of dust. As we said before, there is no difficulty in stopping the dust nuisance; the fear of increased expenditure is the only deterrent. In this connexion, we may mention that Mr. Cooper, the Engineer to the Wimbledon District Council, states the cost of ordinary macadam in that district to be 9'15d. per yd. super, exclusive of watering and scavenging; while, on the basis of an estimate recently received by him, the comparative cost of tar macadam would be 10'5d. per sq. yd. He adds that there would be considerable saving both in watering and in scavenging. Hence we may fairly conclude that very little additional expenditure would be incurred in the long run by the adoption of the improved method of construction.

The Basingstoke Canal (Hants. and Surrey). THIS undertaking will be offered for sale by auction in the course of next month. The canal, which, whilst lately repaired, has been but little used for navigation purposes during many years past, was first projected in 1772, when it was proposed to make a canal from Basingstoke to a junction with an intended canal from Reading to Bray on the Thames. That scheme having come to naught, a body of thirty-three subscribers, under the style of the "Company of Proprietors of the Basingstoke Canal Navigation," obtained in 1778 an Act (18 Geo. III., c. 75) to raise 126,000*l.* for the construction of a canal thirty-seven miles long to the river Wey. In 1793 they obtained a further Act (33 Geo. III., c. 16) for raising additional capital of 60,000*l.*, having spent most of their resources upon the tunnel through Grewell Hill. The navigation was opened in 1796 for vessels limited to a beam of 13 ft. and a length of 72 ft., with a minimum burden of 15 tons. Beginning from the river Loddon near Basing village, the canal takes a level and winding course of twenty-two miles through Hampshire, passing Old Basing and Nateley, and in a tunnel nearly three-quarters of a mile long, cut through the chalk of Grewell Hill, whence, as well as from the Loddon, was obtained the principal supply of water for lockage, etc., and so to the river Deepford, passing by Odiham and Winchfield, skirting Dogmersfield Park, and thence by a long aqueduct across the valley to Crookham and Aldershot, where is the reservoir. That length of twenty-two miles had a top-level 38 ft. wide, and was 5½ ft. deep. Crossing the Blackwater river, which separates the two counties, at a point near Ash in Surrey, the canal bends northwards by Romping Down to Frimley, whence it turns eastwards to Pirbright, Horsell, and its junction with the Wey at a point between Weybridge and Byfleet. The latter portion, through Surrey, of which the course is now closely followed by the main line of the L. and

S.W. Railway, is fifteen miles in length and has twenty-nine equal locks, with total fall of 195 ft. between the Blackwater and the Wey. A side branch, miles long, and level, was made across Hook Common northwards to Turf Green near Strathfieldsaye.

Standards of Fire Resistance. THE British Fire Protection Committee send us a pamphlet (No. 82 of the publications) containing—in English, French, and German—a tabular statement of what they consider ought to be the standard of capacity to resist fire (1) floors and ceilings, (2) partitions and (3) doors. Each of these types of structure is again classified under the headings, including respectively structures calculated to afford "temporary protection," "partial protection," and "full protection." In the text it is explained that "temporary protection" implies resistance against a fierce fire for at least three-quarters of an hour; "partial protection," resistance for at least an hour and a half; and "full protection," resistance for at least two hours and a half. The tables do not attempt to define the details of structures which should satisfy the conditions—that would, indeed, hardly be possible, as new methods are being constantly introduced; they give, however, the duration and the kind of test which floors, partitions, etc., ought to pass in order to come under any one of the three headings. The pamphlet is accompanied by a letter, signed by the Chairman and General Secretary, calling our attention to the mis-use of the word "fire-proof" and "respectfully suggesting" whether it would be practicable to adopt instead the word "fire-resisting." To this we may be excused if we reply in the somewhat hoarse phrase—"Don't teach your grandmother." This view was laid down strongly in our columns, and the expression "fire-resisting" definitely adopted in place of "fire-proof," years ago by the British Fire Prevention Committee. We have ever heard of; and to have our advice solemnly offered to us at this time of day is rather amusing.

An Unsatisfactory Competition. AN advertisement has been sent to us, which has appeared in a Newcastle paper in which the Bewell and Fen District Council ask for competition designs for a Public Library to 4,000*l.*, offering premiums of 70*l.*, and 25*l.*, with the simple announcement "the successful plans to become the property of the Council." Nothing said of an assessor, and an architect wrote to ask whether one would be appointed got no reply. The premiums are liberal in proportion to the proposed expenditure on the building; but in every other respect this seems a competition to be avoided by judicious people.

CLUB PREMISES, LEMINGTON, NORTH HAMPSHIRE.—The new premises of the Lemington and Institute, Ltd., were opened on the 3rd inst. The building is of stone at the east and north sides, and brick at the west and south, and the cost will cost nearly 5,000*l.* The contractor is Mr. Harry Maughan, of Lemington, designs having been prepared by Mr. W. Maughan, of Hexham.

MAGAZINES AND REVIEWS.

THE *Art Journal* devotes an article to two painters of more promise than performance, Smetham and Allston Collins, both belonging to the early half of the last century; the latter a son of Collins the Academician, that painter of quiet and luminous coast scenes. Allston Collins was the original of the figure of the Huguenot in Millais's picture. Both Smetham and Collins were more or less associated with the pre-Raphaelite movement, or at least numbered some of their closest artistic friends among the brotherhood.

Smetham had some points of resemblance with Blake, of whom he was a great admirer. Both were painters whose aspirations seem to have been greater than their powers of realising them; indeed Collins "abandoned painting in despair" in his thirtieth year. His picture of "The Novice," which forms the frontispiece to the *Art Journal*, is however a fine and impressive work, as far as one can judge of it in black and white; a nun looking into a pond covered with water-lilies, with a very intricate and elaborate background of flowers and a hedge, on which patient execution of the pre-Raphaelite type seems to have been expended. Among the designs by Smetham which accompany the article, that of "The Enchanted Princess" almost unquestionably influenced the composition of Millais's "Ophelia." The two artists were well worthy of a kindly notice to keep their memory green. Mr. Cecil Smith, the new keeper of Greek and Roman antiquities at the British Museum, contributes an article on the interesting and rather novel subject, "Sunrise on Greek Vase-Paintings"; not of course realistic representations, but symbolical designs.

The *Burlington Magazine* contains an article on the house and collection of Mr. Edgar Speyer, in Grosvenor-street, which seems to include a most remarkable assemblage of pictures and works of decorative art. Among the illustrations is that of the splendid side-board in the dining-room, a partially modern one on XVIIth century lines, with two original Renaissance figures of boys worked in as part of the construction, and a small marble fountain basin of the same period, on a slender stem, placed in a niche in the centre. On this is a bronze group of a nude child with a swan, executed by M. Morel for this position, and having itself all the air of a piece of Renaissance work. "Notes on the decorative vase of Famille Verte (Chinese) porcelain," by Sir W. Bennett, is accompanied by full-page illustrations of two magnificent vases of this ware, one of which forms the frontispiece, and which leave one in no doubt as to their decorative "value." We agree with the writer in thinking that metal mounts on such vases add nothing to their decorative effect, and in fact, whether original or not (which seems often to be a doubtful point), clash somewhat with the character proper to porcelain. Mr. Lionel Cust and Professor Dolschütz, in No. III. of "Notes on Pictures in the Royal Collection," treat the subject of the portrait of Christ, one of a series of sacred pictures acquired by Prince Albert, and probably painted, we are told, by a Greek priest at Venice, about 1640. The point of the article is as to the resemblance between this and the earlier supposed portrait of Christ preserved in the chapel of the convent of San Bartolomeo degli Armeni at Genoa, now inaccessible, and only known through a copy of it made by Thomas Heaphy, and now in the British Museum. The claim for authenticity in the case of the Genoa portrait is of course purely legendary, and the subject narrows itself down to a question of the authenticity of copies of it. One feels it, however, to be not entirely impossible that these pictures may be the survival of some remote and rude representation of the head of Christ, if not contemporary, done from memory or from description handed down, probably somewhat modified and conventionalised by Byzantine taste. It seems a thread of possibility, but no more; nor is that question considered in the article.

The *Berliner Architekturwelt* contains an article written by Professor A. Gotthold Meyer, on "Two Textbooks of Palatial Architecture" (Zwei Lehrbücher Fürstlicher Baukunst). The first of these books, by Paul Decker, appeared in 1711, and the author confined his attention to residences or palaces suitable to "a great lord, who has to rule over his country and people, and whose high position must be indicated in the splendour of his state and residence." In order to carry out Decker's designs he would moreover have to possess

fabulous wealth. This constitutes the charm and also the danger of these idealistic plans. Neither the site nor the materials present any difficulties; ways and means are ignored, and it only remains for the artist to think of a sufficient number of buildings for all possible occasions, and, above all, to display a sufficient wealth of imagination; from this point of view Decker certainly succeeded. His work, however, is chiefly interesting as representing a phase in the history of Architecture, and does not bear any personal significance. About four generations later, Karl Friedrich Schinkel brought out a similar work, describing the plans of a residence, which, "whilst within easy reach of a large town, should contain within itself all the necessities and accessories for the highly-cultured life of its princely owner." Schinkel has less to say than Decker, for he maintains that "the explanatory word can only be an accompaniment. Here, the artistic representation of the object can be the only true mode of instruction." There is a marked contrast in these two conceptions of a palatial residence. Decker provides for festival halls, barons' halls, courts, playhouses, grottos and orangeries; Schinkel considers rooms for collections of brasses and coins, etc., a theatre for the representation of dramatic works, galleries for antique statues, picture galleries, a church, etc. One of Decker's designs is of the most fearful and monstrous *rococo*; Schinkel's, of course, are founded on Greek lines, and contain some fine architectural suggestions. Among the general illustrations two fronts by Herr Messel, of Berlin, in despite of some oddities of detail, show architectural character and expression.

In the *Architektonische Rundschau* two country houses by Herr Schutte, of Barmen, effectively illustrated in broadly-tinted elevations, may claim the praise (not often to be given to German country house designs) of being picturesque without eccentricity. But we have the latter element provided in the Villa Strollberger, by a Munich architect, a sort of nightmare of a house, with a plan twisted into all kinds of shapes, and in the street house in Eisenacher-strasse in Berlin (Herr Paul Jatzow), with its door cut out of the middle of a great circular framework, in the true style of German cleverness. But the most noteworthy thing in the number, in one sense, is the presence of a most daintily-executed little chromolithograph showing an interior in early Georgian style by Messrs. Heal and Son of London. It is the first illustration of English work that we remember to have seen in the *Rundschau*. Perhaps, having discovered the existence of an English furniture firm, we may even hope that the editor of the so-called "Rundschau" may some day recognise the fact that there are English architects.

Public Works is this month very much occupied with Glasgow; there are articles on "The Art Galleries and Museums of Glasgow," by Mr. James Paton, the superintendent of the Glasgow Art Galleries; on "The Glasgow Main Drainage System," by the City Engineer (Mr. McDonald); "Glasgow Municipal Telephones," by Mr. A. R. Bennett; on "Glasgow Botanic Gardens," and on the Glasgow Municipal Buildings, the latter by Mr. W. Macleod; it is merely descriptive, not critical. "Navigable Waterways in Belgium" is the subject of an article by Mr. Hertslett, the British Consul-General of Belgium. The article is a very interesting one, and shows how fully inland navigation is developed in Belgium. About 85 per cent. of the navigable waterways are under the direct control of the State, which is also a large shareholder in the canals conceded to private companies. There is a short article on "The Structural Aspect of the Housing Problem," specially in reference to Glasgow, by the City Engineer. The cheapest houses the Corporation have been able to build are 145 houses of two apartments, letting at 8*l.* a year, and 112 of single rooms letting at 5*l.* a year; built at a cost of 4*½*d. per cubic foot. These undertakings just clear themselves, but they do not provide for the poorest class. The writer says:—

"The only way in which the housing of persons of this class can be approached is to recognise that the habitations provided for them must be structures of a special type, wherein everything is reduced to the simplest form, and everything that is not absolutely indispensable must be discarded. A weatherproof shelter with ample space, water supply, and sanitary accommodation, but little more; the whole details so rigidly plain that some relaxation of the Building Acts may be required should the erection of the houses be resolved on; but a clean, healthy dwelling in every way preferable to the abodes of squalor and misery in which the aethermost units are huddled together at the present moment."

Mr. McDonald gives specimen plans of three types of block dwellings for this purpose, in double and single apartments, which are very compact; but the system of placing the bed in a recess of its own size is not healthy. It would be better to have a turn-up bed which would fold up into a shallow recess during the day, and stand out on the floor at night. Sleeping in the confined air of a recess means want of ventilation.

The *Antiquary* contains an article by Mrs. Cuthell on "The Manor-Houses of the Isle of Wight," partly historical in regard to families etc., partly descriptive in regard to the buildings themselves—Yaverland, Arreton, East Standing, and others. The article is to be continued. The subject is an interesting one, not only as all old houses are of interest, but because, as everyone who knows anything of "the Island" must have noticed, Isle of Wight architectural developments are peculiar and have strongly marked local characteristics. Mr. George Bailey contributes an article on "The Wynno Brasses at Llanrwst" which are attached to the wall of the Gwydr Chapel at St. Mary's, Llanrwst, which chapel, added to a church of the Perpendicular period, is credited to Inigo Jones. Illustrations of these brasses are given; they show portrait heads enclosed in square frames set lozenge-wise. The second, that of Lady John Wynne, furnishes a careful and detailed illustration of the head-dress, collar, and coiffure of a lady of the Charles I. period.

Blackwood, under the heading "Musings without Method," gives some trenchant comments on the result of the Chantry Bequest Commission—one of the many evidences which show how strongly the action of the Royal Academy in this matter has affected the best class of public opinion. We agree in spirit with the comment, except in regard to the writer's favourable view of the Committee's proposal to commission sculptors to carry out, in monumental materials, works only finished in plaster or clay; a proposal which we consider as essentially contradictory of Chantry's provision that no commissions were to be given. The writer expresses only what is the plain truth in his remark—"That the Trustees should buy one another's works at comfortable prices is no doubt convenient to them, but it is a direct violation of Chantry's wishes." The most noteworthy point in the article, however, is the warning which it gives that the public will not much longer put up with the Academy's policy of sublime indifference to all outside opinion. "So long," he observes, "as the number of shillings taken at the doors shows no decrease, the Academicians will regard themselves and their works as above and beyond criticism, even though a gentle acquiescence might be to their advantage. But if they remain obdurate, one day they will find less shillings in the till, and then at last they will realise that in their pride they have killed the goose that laid the golden eggs."

The *Fortnightly* contains an article on G. F. Watts by Professor W. Knight. It is not so much a criticism of his artistic work as a reminiscence of many of Watts's sayings and opinions on men and things; all of them interesting and characteristic, but not all very balanced or central in judgment. To tell a friend who had just returned from Rome, and whom he met at the exhibition of Burne-Jones's pictures in the New Gallery—"Well, in all Rome you saw nothing finer than this, nothing finer than this," certainly savours more of loyalty to a friend than of a sense of the proportion of things. Professor Knight hammers away over and over again at the point that Watts's persistent idea was to make Art a means of moral teaching. Watts undoubtedly thought so in the latter years of his life; he seems to have forgotten the days when he painted such a work as "Daphne"—one of his most beautiful and perfect productions, of which we hear nothing now, so much has this unfortunate idea of Art as a preacher taken possession of the minds of Watts's admirers. But what sane critic would put Watts's latter-day paintings of Eve, for instance, or his almost grotesque typical figure of "Woman," beside a work of such classic beauty as the "Daphne"? But there is no sane criticism about Watts at present; we have not seen an instance among the numerous magazine articles of anything like a serious and thoughtful attempt to discriminate between the greatness and defects of his work. Of the nobility and greatness of Watts's character, apart from his art, there can however be no two opinions. Professor Knight mentions some fine traits of

this; among others (what we have not seen mentioned before) his withdrawing, at the age of 74, from his right as an Academician to place his pictures; requesting to be judged by the Hanging Committee along with the outsiders, lest in his old age he should unconsciously have produced what would do himself or the Academy injustice. When one remembers the absurdities which certain aged Academicians continued to inflict on the public year after year, one cannot too much admire such a noble reserve and distrust of himself as Watts showed in thus acting.

To the *Monthly Review* Mr. T. Andrea Cook contributes an article "On the Romance of Coinage"; a slight sketch of some of the points of interest in coins and medals ancient and modern. He shows good reasons for thinking that our modern effigy of Britannia with the shield may be traced, in its main composition, to a medallion of Commodus. The motif occurs in a farthing of Charles II. and one of Anne, with differences of detail. The Britannia on the penny of 1800, though a little stiff and academic, is a better design, in decorative line, than that on the penny of 1901. The medal commemorating the sixtieth year of Queen Victoria's reign is contrasted with the medal of the French Republic, with its beautiful head with a crown of leaves; the two are typical of the two nations; the sober realistic portrait on one, the *spirituelle* ideal head on the other. But then, of course, a Republic can be symbolised and idealised, while a sovereign's coinage must show the sovereign's head. The same contrast is even more strikingly shown in the penny of 1902, with the King's head, and the French *sou* of the same year, with its lovely ideal head of the Republic again, a quite different design from the other, and even more fascinating. The point is, that in our own coin not the slightest attempt is made to treat the portrait head with any decorative accessories (except a row of dots round the rim of the coin); it is stamped blankly on the circular space, for which it appears too large, in the most prosaic and practical manner. The two coins emphasise painfully the difference between an artistic and an in-artistic nation.

The short article on "Radium: Its Properties and Possibilities," by R. J. Strutt, in *The National Review*, deserves to be widely read. It gives a clear and reasoned account of our present knowledge, and is more instructive than any of the books on radio-activity which we have read. It is not burdened with the names of unknown scientists who have obtained experimental results, apparently at hap-hazard, or whose brilliant and daring speculations on the nature of matter have startled authors. With the exception of Helmholtz, no scientist's name is mentioned. The article is imbued with the true scientific spirit. The temperate statement of the facts and the consistent explanations given by Mr. Strutt will be appreciated by every thinking reader. We were especially struck by the way he proves that radium is not a permanent metal, and how, by supposing that there is a constant evolution of radium in the sun, the millions of years of temperate warmth required by geologists and zoologists to account for the strata and the fossils in the earth's crust can be reasonably obtained.

Harper contains an article by Mr. G. W. Ritchey, Superintendent of Instrument Construction at the Yerkes Observatory (U.S.A.), on "Photographing the Star-Clusters." The article is accompanied by some fine photographs of star-clusters, included a view of the Pleiades group. It appears that the ordinary system of a clock-driven telescope to follow the object in the heavens is not sufficient for these delicate observations with very large telescopes, the movement of the telescope not being sufficiently perfect to give sharp photographs:—

"It is necessary to devise some means by which the astronomer can watch throughout the entire time of the exposure of the photographic plate, can detect any minute movement of the image of the celestial object from its proper position, and can instantly correct or compensate for such movements. There are several methods in use of accomplishing this hand-guiding or correcting; the most refined method is by the use of an attachment called the double-slide plate-carrier. The observer sits with his eye at the guiding microscope of the attachment, and with his fingers on the milled heads of two fine adjusting screws, and he is able to introduce with extreme accuracy and quickness any corrections which he sees are necessary."

Mr. Ritchey believes that when a reflecting telescope is constructed equal in power to the largest refractors, through which observations can be continued for a long term of years, we

may be able to observe and chronicle changes in the star clusters which are too slow to be detected by our present means.

The same issue contains an article on "Ravenna" by Mr. Arthur Symons, which however is of merely literary value—a record of personal impressions given in picturesque language.

In *Scribner*, under "The Field of Art," Mr. Russell Sturgis gives a description and criticism of the pediment sculpture of the New York Stock Exchange, by two American sculptors, Mr. J. Q. A. Ward and Mr. P. W. Bartlett, the original model having been by Mr. Ward. The New York Stock Exchange shows the façade of a Greek temple in the Corinthian style; on the pediment are a collection of a few figures on colossal scale and in very bold relief; mostly nude, the muscular development of the figures being, according to Mr. Sturgis, considerably and purposely exaggerated. The sculptor seems to have found the usual difficulty in dealing with the low angle spaces of the pediment, and his nude figures sprawled on the top of the cornice at this point are not very dignified. The whole thing however, seems from the illustrations to be a powerful piece of work; but the question is whether it is not all architecturally and sculpturally a mistake. What has the purpose of a Stock Exchange in New York to do with this Greek temple decoration? "Reminiscences of Sir Henry Stanley," by Mr. Montmency-Jepson, is a short paper which will interest many English readers.

The Century contains an article on "The Dinosaurs of the Bone Cabin Quarry," by Mr. H. F. Osborn. The Bone Cabin, in Albany, U.S.A., was discovered by Mr. Walter Granger of the American Museum expedition, in 1897. It contains bones of extinct animals of enormous size and length of limb and neck, of which some restorations are given, not so conjectural as might be hastily supposed, for the complete skeleton structure is there. The article is a very interesting one, and Mr. C. R. Knight's illustrations are admirable. "Japan's Highest Volcano," the subject of an article by Mr. H. G. Ponting, is not Fuji, which is extinct, but the highest active volcano, Asamayama. "Ballooning as a Sport," by Mr. G. de Geofroy, gives some practical experiences as to the conditions of ballooning, especially in regard to the modern quasi-dirigible balloon.

In *The Gentleman's Magazine* Mr. Dunlop-Wallace-Goodbody concludes his long article on Forum Julii or Fréjus, a very interesting historical summary, coming down to the day when the Cesar of modern times took up his temporary abode at Fréjus on his way to Elba. The same number contains an article by Mr. Vincent Heward, F.R.A.S., on the planet Mercury, summing up some of the results of modern telescopic information, among which is the fact (of which at least Schiaparelli, after a long series of observations, entertained no doubt) that the relation of Mercury to the sun is the same as that of the moon to the earth; the planet having no diurnal revolution, and presenting always the same face to the sun. On such a planet, exposed to a tremendous glare on one side and perpetual darkness on the other side, there can be at all events no life comparable to life on the earth; and probably Mercury, like the moon, is an arid waste.

The Pall Mall Magazine has an article on Montagu House, Whitehall, the Duke of Buccleugh's town mansion, with illustrations of some of the principal rooms, with their sumptuously decorated ceilings and cornices, and a description of some of the artistic contents of the house. Mr. Lewis Hind contributes an article under the title "A Day with Velasquez," commenting on the contents of the Velasquez room in the Prado Museum at Madrid, the central object of which is what the writer justly characterises as "the greatest historical picture mortal man has produced"—"The Surrender of Breda."

CONVALESCENT HOME, SHOTLEY BRIDGE, DERHAM.—A new wing of the John Spencer Convalescent Home for Sick Children at Shotley Bridge was opened a short time ago. The building is three stories in height, and will provide accommodation for sixty-five additional children, with dining-hall, kitchen, lavatories, and nurses' quarters. The work has been carried out under the supervision of Mr. D. M. Spence, architect, of Shotley Bridge, and the contractor is Mr. T. A. Turnbull, of Rowland's Gill.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A MIDLAND Counties meeting of the Association of Municipal and County Engineers was held at Birmingham on Saturday, for the purpose of inspecting the sewage works of the Birmingham, Tame and Rea Drainage Board. The Birmingham works are of very great interest, by reason of their extent, and the important experiments in the bacterial treatment of sewage conducted by Mr. J. D. Watson, Chief Engineer, and the meeting brought together a large number of members from all parts of the country. Mr. A. T. Davis, County Surveyor of Shropshire, President, occupied the chair, and there were present Messrs. J. D. Watson (Birmingham), J. T. Eayrs (Birmingham), J. E. Wilcox (Birmingham), C. F. Wike (Sheffield), W. Harpur (Cardiff), R. E. W. Berrington (Wolverhampton), J. W. Brown (West Hartlepool), W. H. Hopkinson (Keighley), T. Schlund (Woolwich), R. Pierce (Singapore), W. Stubbs (Blackburn), T. J. Guilbert (Gloucester), H. Richardson (Hendonsworth), hon. sec., J. P. Norrington (London), A. H. Campbell (East Ham), F. W. Ruck (Maidstone), E. W. Holmes (Walthamstow), and others.

The morning was occupied with an inspection of the purification works at Minworth Grange, including the regulating chamber, Dortmund tanks, experimental bacteria beds, and primary and secondary percolating beds.

The President and members of the Association then drove to the Home Farm at Tyburn, where they were entertained to luncheon by Mr. J. D. Watson.

The President proposed the health of Mr. Watson, and thanked him for giving them an opportunity of going over the works, which extended to nearly 3,000 acres.

Mr. Watson, in reply, explained that they had a Drainage Board constituted by Act of Parliament, which included Birmingham—the predominant partner—Aston, Handsworth, Erdington, Smethwick, Sutton Coldfield, and one or two minor places, which had combined together or treating the sewage of a population of 860,000. Formerly the whole system was that of broad irrigation and downward intermittent filtration, but they were now changing it to the bacterial system, though they had a sewage very hard to septicise, as it contained a large amount of iron salts. While they were going in for bacterial treatment very largely, they were not dissatisfied with land treatment, from which they had obtained a purification of 92 and 93 per cent. Their idea was that if they could reduce the area on which they disposed of the sewage they would minimise the chance of nuisance, and they would not have so great a difficulty as to the area of land.

The district business was then transacted, and on the proposition of the President, Mr. H. Richardson, of Handsworth, was re-elected secretary for the Midland district of the Association.

Mr. G. A. Hart read a paper on recent experience in sewage and sludge disposal at the Salfley Outfall Works of the Birmingham, Tame and Rea District Drainage Board. He said the modifications which had been introduced from time to time into the general method of sewage treatment adopted at the Salfley Works during the last three years appeared to have a somewhat interesting bearing in relation to the general question of sewage and sludge disposal. In 1900 the outfall works then constructed for the tank treatment of the sewage and the disposal of the sludge at Salfley, consisted of:—First, an installation of three tanks for preliminary treatment of the sewage, called roughing tanks. Each tank averaged 328 ft. long by 94 ft. wide, and 5-64 ft. deep, having a total combined holding capacity of 3,216,100 gallons. Each of the tanks was rectangular in plan, with side walls constructed of brickwork, and had brick-paved floors, having a slight fall lengthways from the outlet towards the inlet end. They were divided into three sub-divisions by cross walls carried up to within 2 ft. of the sewage surface. The compartment at the outlet end consisted of one-half of the total capacity of each tank—i.e., holding about 500,000 gallons. The remaining two compartments of each tank were of equal size, and held about 250,000 gallons each. Floating scum-boards to prevent the passage of floating refuse, such as corks, etc., were fixed across the inlet end of the tanks. The contributory population to the outfall works was estimated at 707,000, and the average daily dry weather flow was estimated

at 21,000,000 gallons per day. The sewer inlets entered the tanks at a level of about 3 ft. above the floor, and the flow of the sewage was regulated through each of the tanks in parallel. After passing through these preliminary tanks the sewage was conducted into the second installation of tanks, termed finishing tanks. These were also constructed of brickwork, with brick-paved floors, having a fall from the centre line to the inlet and outlet ends respectively. There were sixteen of these tanks, each measuring 150 ft. by 50 ft. wide, with an average depth of 6.07 ft., having a total holding capacity of 4,539,500 gallons. The combined total roughing and finishing tank capacity at the outfall works therefore amount to 7,755,000 gallons. Sumps were constructed in the floors of the compartment of the tank for the collection of the sludge. A Priestman grab attached to a steam crane, travelling in a 4 ft. 3 in. gauge tramway, extracted the heavier lectrus, which was deposited in tip wagons, and at once removed and tipped in the form of a surplus soil bank in the immediate vicinity of the works. Early in 1902 the outfall works were extended by the addition of two further roughing tanks. They were of similar construction to the tanks previously described, holding about a quarter of a million gallons each, and four additional finishing tanks, and having each a holding capacity of 680,920 gallons. No further addition to the tank capacity of the works had since been made. The total combined roughing and finishing tank capacity at the present time was as follows:—Five roughing tanks, 5,610,150 gallons; twenty finishing tanks, 7,263,180 gallons; total tank capacity, 12,873,330. Simultaneously with the increase in the tank accommodation, storm-water filters of an area of half-an-acre each, and containing medium to the depth of 5 ft., consisting of screened gas coke, were constructed for the treatment of storm-water conjointly with the tank extensions. A cast-iron underground sludge main was permanently laid about 4 ft. deep, extending from the outfall works for a distance of 2½ miles through the farm-lands to Castle Bromwich. New buildings were erected containing two Lancashire boilers, each 30 ft. long by 8 ft. diameter, and the existing engines were rearranged and connected to a pair of belt-driven air compressors, which supplied compressed air to a series of four Shone's pneumatic ejectors, which were connected with the cast-iron sludge main. Two additional sludge pumps were installed in the engine-house for the purpose of extracting the sludge from each of the tanks. From the year 1872 to February, 1901, the general system of sewage treatment at the works consisted of chemical precipitation, followed by subsequent sedimentation in the two installations of tanks termed roughing and finishing tanks, the final tank effluent being subsequently treated on land. The cost of the lime treatment amounted, in the year 1900, to 4,332., which was equivalent to a cost of 11s. 6d. per million gallons of sewage treated. On account of the rapid increase in the volume of sludge precipitated by the liming process, it was decided to entirely suspend the liming of the sewage, and to commence the promotion of bacterial action in the tanks. It was predicted that it would be practicable by adopting a method of frequently and rapidly removing from the roughing tanks the sludge as it was deposited, to counteract the effect of some of the acidified discharges of sewage which periodically passed down to the works by increasing the effective tank space, and that an important advantage anticipated by the promotion of septic fermentation would be a reduction in the volume of sludge produced in the tanks, together with a saving in treatment at least amounting to the cost of the unslaked lime. To counteract this advantage it was anticipated that the tank effluent resulting from bacterial action and sedimentation would contain a much larger quantity of suspended matter than the chemically precipitated effluent had hitherto produced, and some anxiety was felt as to the result of the application of the unlimed tank effluent upon subsequent land treatment, and it was satisfactory to be able to say that as the result of further investigation upon this point extending over the last three years, it had been established that the land effluents had shown annually a gradual improvement. On the albuminoid ammonia and oxygen absorbed bases, in terms of percentage of purification upon crude sewage, this improvement was indicated by the following figures:—1901, albuminoid ammonia basis per

cent. 88, oxygen absorbed basis per cent. 88; 1902, albuminoid ammonia basis per cent. 92, oxygen absorbed basis per cent. 90; 1903, albuminoid ammonia basis per cent. 92, oxygen absorbed basis per cent. 93. The effect of the change in treatment from chemical precipitation to septic fermentation in the volume of sludge arrested in the tanks justified anticipation. As a result of fifteen months' observation, it might be stated that the reduction in volume of the sludge deposited in the tanks amounted to 58 per cent. of the total bulk, expressed in terms of cubic yards of sludge per million gallons of dry weather flow. The figures were as follows:—Lime treatment, 35.55 cubic yds.; septic treatment, 14.85 cubic yds. This method of treatment was consistently followed out until March, 1903, but a disturbing element which had an appreciable effect upon the treatment was introduced in 1902 by the addition of two extra roughing tanks and four finishing tanks. This additional tank accommodation, representing an increase of 66 per cent., increased the volume of sludge deposited in the tanks by 22 per cent., making the total volume of sludge deposited per million gallons of dry weather flow amount to 18.20 cubic yds. Simultaneously with the increased tank accommodation, a storm-water weir was constructed in the roughing tank effluent channel. The combined sewage and storm water was now treated together in the five roughing tanks, and the storm water after sedimentation being automatically diverted over the storm overflow weir for subsequent treatment on straining filters before its final passage into the river Tame. In its passage from the tank into the sludge suction-chamber the sludge was passed through an iron screen of about 1½ in. mesh, to which was attached a revolving rake which effectively extracted from the sludge the cloths, rags, and similar fibrous material. This method had proved most effective; its chief recommendation being that in lieu of a large quantity of elaborate screening machinery which would be required if this comparatively small percentage of fibrous material were extracted from the crude sewage, it had been found quite practicable to allow the material to deposit itself and remove it in bulk in a comparatively short time; the whole of one week's sludge being effectively screened and removed from each tank in about six hours. The average volume of liquid sludge removed per day from the tanks for the past thirteen months amounted to 590 cubic yds. per day on an estimated dry weather flow of 22,000,000 gallons per twenty-four hours, which was equivalent to 26.22 cubic yds. per million gallons treated. The effect produced by this system of frequent cleaning was to increase the volume of liquid sludge deposited in the roughing tanks by 44 per cent. The propagation of septic fermentation in the finishing tanks, together with the frequent cleaning of the roughing tanks, was continuously followed for a period of thirteen months. As the result of observations taken during that period it was conclusively established that, although the efficiency of the roughing tanks for sedimentation had been increased 44 per cent., the septic tanks gave unmistakable evidence of becoming inert. The most reasonable theory which the author could put forward to account for this phenomenon was to the effect that the increase in the effective roughing tank capacity produced such a degree of sedimentation that the greater bulk of the organic substances containing the fermentative organisms necessary to promote septic action were deposited as sediment in the roughing tanks, and the finishing tanks were therefore deprived of the elements upon which their septic action depended. To remedy this defect, in May, 1904, directions were given that the whole of the lighter organic sludge which was deposited daily in the roughing tanks should be pumped into the septic tank inlet channels. The quantity of sludge thus transferred from roughing to finishing tanks had been gradually increased during the last three months, and at the present time a volume equal to 30 per cent. of the total sludge deposited, was daily passed into the septic tanks. There had been no indication that the finishing tanks had attained their ultimate efficiency; the fermentative action was almost immediately restored, and was being gradually increased month by month. It was interesting to observe that, as a result of three and a half years' continuous septic fermentation in the finishing tanks, extending from March, 1901, to May, 1904, the residual products deposited therein during that period, and

which it had been deemed advisable to remove therefrom in the form of sludge, had only amounted to the volume of 25,000 cubic yds., that was a volume equal to half the holding capacity. The septic residuum was deposited on land in a layer of about 15 in. deep. It gave rise to no offence, no smell had been detected arising therefrom, and, after lying open and exposed to the action of the atmosphere for six months, and being ploughed over, it would be difficult now to differentiate between the appearance and characteristics of natural surface soil and this material. There appeared to be some foundation for the belief that many of the very real difficulties which attended the removal and disposal of sewage sludge might be alleviated by judicious tank treatment, and it appeared to be equally essential that the utmost care and regard should be given to detail in the application of the treatment; and to the design of those works dedicated to the various functions embodied in the treatment if results of an efficient and generally satisfactory kind were to be produced. The average yearly current expenses occasioned by the treatment of the sewage by chemical precipitation with lime and disposal of the sludge was 7,785l. 19s. 10d. The average yearly current expenses occasioned by the treatment of the sewage by sedimentation and septic fermentation was 3,092l. 3s.

Mr. A. Bryan, resident engineer, gave a description of the purification works in course of construction at Minworth Greaves. He said the works, being constructed by the Birmingham, Tame, and Rea District Drainage Board for the bacterial purification of sewage, were situated in Sutton Coldfield, and were distant some five miles from the outfall works at Saltley. The works in course of construction comprised:—(1) An intake chamber to form the connexion between the existing main supply conduit and the new works, in which was fixed an apparatus for automatically regulating the flow of sewage, so that in dry weather a constant volume would be delivered to the bacteria beds. (2) A series of silt or sedimentation tanks to remove the suspended and floating matter present in the septicised sewage. (3) An installation of primary percolating beds to effect a partial purification of the sewage. (4) The provision in the main effluent channel for the primary beds of a sedimentation tank to arrest the humus in the filtrate. (5) An installation of secondary percolating beds to complete the work of purification in the event of land not being available for the purpose. The works, with the exception of the 1½ acres of experimental beds, which had been constructed by direct labour under the author's supervision, were being carried out by contract by the following firms:—Constructional work, Mr. W. Cunliffe, Birmingham; cast-iron pipes, The Clay Cross Iron Company; sluice valves, Messrs. Guest and Chimes, Rotherham; special distributing pipes and flexible joints, Messrs. Jones and Attwood, Stourbridge; aerating floor, Mr. H. R. Mansfield, Church Gresley; medium (bricks), Messrs. Freakley and Co., Tipton; medium (granite), Jess Hartshill Granite Company, Atherstone. In many percolating beds recently constructed the bottom layer of medium had been composed of large material, the object being to allow the effluent to drain freely from the bed. In beds constructed on this principle the water, in finding its way to the channels, pursued a very erratic course through the intricate passages between the medium, and repeatedly changed its direction before it was clear of the bed. This must of necessity cause many small eddies and backwaters, in which the suspended matter, which had no great difficulty in finding its way by gravity to the bottom of the bed, was deposited in a gradually increasing quantity, which would in time render the lower portion of the bed useless for drainage purposes or for aeration, and the medium would consequently need to be taken out, cleaned, and replaced. The use of an open or aerating floor between the medium and the floor of the bed in a great measure minimised this defect. The effluent, after percolating vertically through the bed, was at once entirely removed from contact with the medium, and found a clear course open to the channels. The depth of water over the floor might be considerable, and still leave the necessary air space beneath the medium; thus, the floor of the bed might be laid to a flatter gradient and head economised. The suspended matter was carried by the flow into the channels and there dealt with. The author had found, first, that the use of floors provided with circular

boles was not satisfactory, as they became stopped up with portions of medium; and, second, that a flat floor had in some degree the defects of allowing the sediment to collect on the flat surface. It was also found at Saltley that the rough brick walls of the small channels forming the floor of the storm filter beds had become coated with mucilage, similar to that found coating the medium of the bed. To minimise these defects the author designed the curved tile used for the beds, and he thought that the smoothly-glazed round surface would allow the sediment to easily reach the slots, which were carried right down to the foot of the tile. The long, narrow slots could not become entirely filled by the medium, and that when the floor was carried through the walls of the bed the slimy coating and any heavy sediment could easily be flushed out, as the force of the flushing water was not destroyed by being allowed to spread out in all directions and become obstructed by the feet or supports of the floor. The distinct channels also induced a current of air, especially on windy days, and thus helped in dispersing the heavier gases generated in the bed. It was found after the beds had been resting for any length of time, that on restarting them the first trickle of effluent from the beds provided with aerating floors reached the channel in about thirty minutes, and from the floor covered with large slag in forty-five minutes; also that the flow from the tiles was general in about sixty minutes; whilst after two hours, about one-quarter of the circumference of the channel draining the slag portion of the bed was still dry. The effluent for some time was very turbid, and contained a large amount of suspended matter, the sediment in the effluent draining from the tile floor being two to three times greater than from an equal area of bed covered with slag. The sediment contained 26 per cent. of organic matter, chiefly broken-down mucilage from the bed. The amount of sediment from the beds appeared to increase somewhat rapidly every three or four weeks, and the oxygen absorbed increased at these times. This was no doubt due to the suspended matter making its way through the medium and collecting on the concrete floor until it was in sufficient quantity to be washed away. When the sediment made its appearance, the channels and tiles were flushed out and cleaned with drain rods, after which the effluent was again clear. The analyses of the effluents showed that a very high nitrification was obtained from the whole of the beds, and the author believed this was largely due to the provision of an aerating floor, combined with the use of a fairly large (3-in. gage) medium for the lower portion of the beds.

Mr. A. J. Dickinson (Birmingham) wished to know whether the putting of Westrumite on the roads of Birmingham had affected the quality of the sewage, and whether it could be identified in the analysis.

The President proposed a vote of thanks to the authors of papers.

Mr. G. W. Lacey (Oswestry), who seconded, said a good deal of information had been given as to the materials used in the bacteria beds. He wished to know whether the revolving sprinklers had been found satisfactory in work.

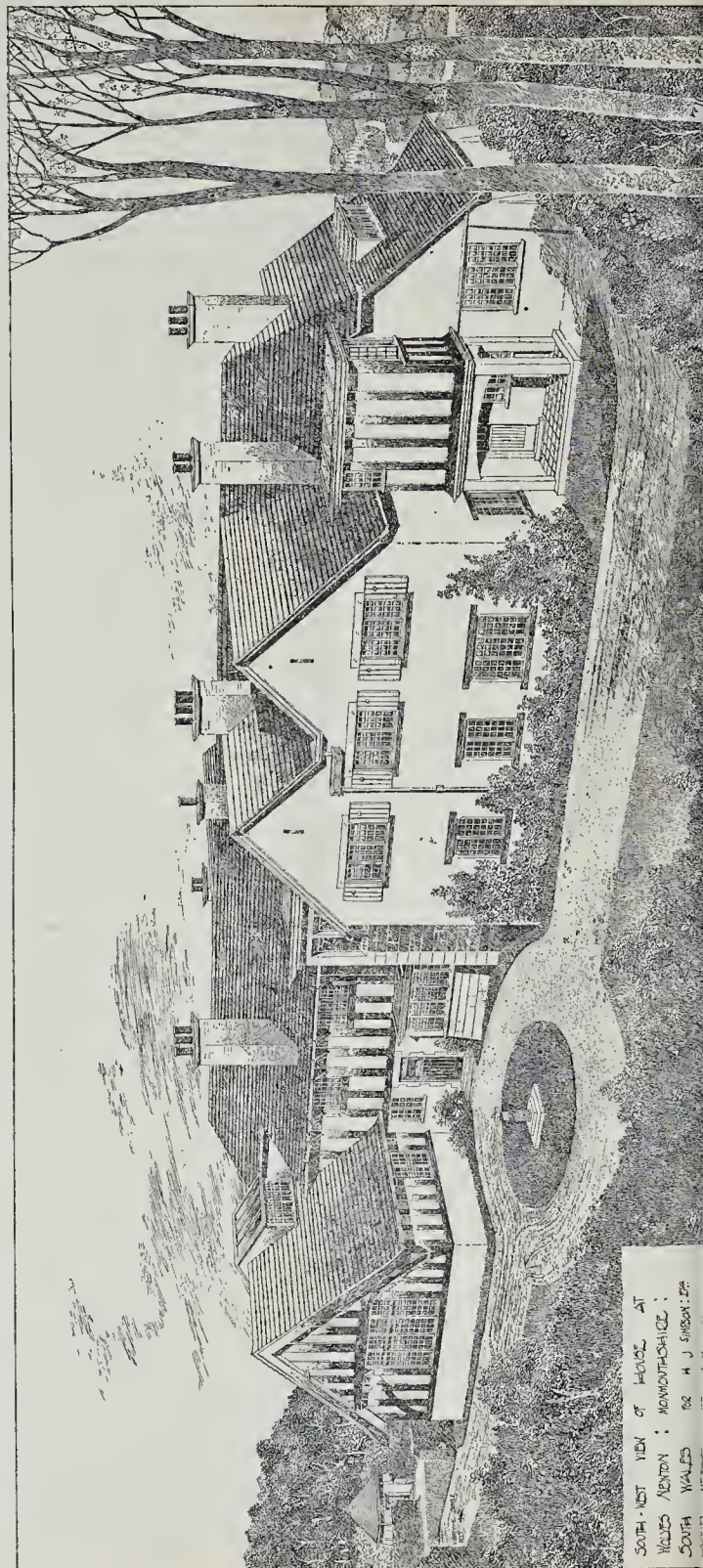
Mr. J. E. Willcox (Birmingham) remarked that the papers contained a great deal of valuable information, more particularly with regard to cost.

The vote of thanks was unanimously accorded to the writers of papers.

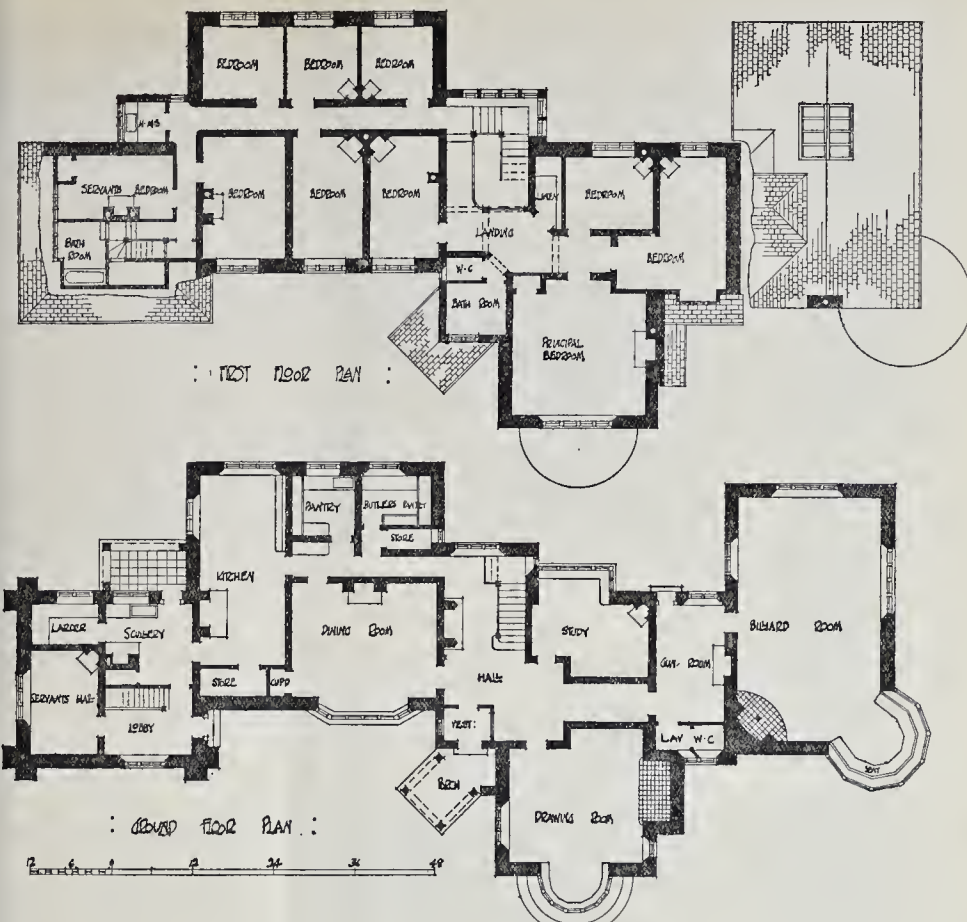
Mr. J. D. J. Roberts, architectural assistant, gave a description of the refuse destructor and electrical power generating station in course of erection at Saltley.

The remainder of the afternoon was devoted to an inspection of the Saltley works, including the sedimentation works, septic tank, sludge screening and sludge ejecting machinery, and the storm-water filters.

NEW SCHOOL, CARLISLE.—The new school which has been erected on a site at the corner of East Dale-street and Denton-street, Carlisle, was opened recently. The building is two stories in height, the ground floor being for infants and the first floor for senior boys and girls. There is a central hall and six classrooms on each floor. The total accommodation provided is for 720 children, 350 infants and a similar number of boys and girls who have passed into the standards. The total cost was about 9,000*l.* The architect was Mr. Brierley, of York.



SOUTH - WEST VIEW OF HOUSE AT
SOUTH - WEST VIEW : NEWTONS :
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SOUTH - WEST VIEW : NEWTONS :



House, Wolves Newton. Plans.

HOUSE AT WOLVES NEWTON, MONMOUTHSHIRE.
 This house was erected on a site overlooking a valley towards Abergavenny and the Sugar Mountain, a distance of about twenty miles. The entire walls are of stone and are externally covered with white rough-cast. All the internal woodwork, main staircase, and interior billiard-room (which has an open timber staircase) are in Bath stone. The roofs are covered with red Bridgwater tiles. The west view of the house was published in the issue for September 13, 1902. The view of this week was taken from the hill at the back of the building.
 The contractors were Messrs. E. Turner and Sons, of Cardiff.
 Mr. A. Jessop Hardwick, of Kingston-on-Thames, is the architect.

THE DRAINAGE OF A HOUSE.
 By W. R. PURCHASE.
 In your issue of August 27, pages 227-8, there is part of an abstract of a paper by Mr. Ernest Smith, read at the recent Glasgow Congress of the Sanitary Institute, re the above subject, in which the use of fireclay glazed drain-pipes is advocated in preference to any other material.
 You were kind enough to insert in your issue of last year (Sept. 19, 1903) a brief notice from me on "The Insecurity of Modern Drainage." Will you permit me again to make a few remarks on this important subject, from a practical point of view? As the build-

ing inspector to a Borough Council for the past twelve years, I have had on an average some three or four hundred new drains to test and approve each year; and prior to that for a few years was engaged in the supervision of a large pottery, where drain-pipes were chiefly made. This experience will, I trust, qualify me in some degree for expressing an opinion on this subject. I may perhaps add that I have no prejudice as regards the material used for pipes, beyond advocating sound and efficient drains, as promoting sanitation and thereby the health and well-being of the community.
 This new advocacy of the fireclay drain-pipe is undoubtedly a retrograde movement, and anyone familiar with the composition of these pipes will, I believe, agree with me that they have only a comparatively short life, and should on no account be used for conveying sewage matter.
 It may be stated that fireclay as a raw material is found in great abundance in the coal-measures beneath the several seams of coal, and is usually a waste product. The clay, when prepared, is capable of standing a high temperature without fusing or becoming soft, and is therefore called refractory; it has a very open grain, is porous except when protected by glazing, and is weak and brittle.
 The glazing is effected by throwing coarse common salt (chloride of sodium) into the fires and kiln at a time when a certain degree of white heat is attained; the salt is at once decomposed, the chlorine escaping as vapour, while the sodium combines with the silica of the clay to form a surface coating of glaze, which in reality is a fine film of glass, covering every part of the ware exposed.
 Fireclay is seen to a great disadvantage

when compared with stoneware made from the clays of the Lias formation, in which the ware is vitrified throughout, intensely hard, dense in texture, non-absorbent and impervious to acids. The salt glazing in stoneware is the actual material itself fused together, differing from all other kinds of earthenware. The great imperfection in stoneware is its brittleness, which for drains generally is fatal.
 The defects to which fireclay drain-pipes are liable are porosity and weakness of the material; cement in joints swelling and contracting; uneven expansion of concrete bed; careless filling in of trench by ramming, etc. In fairness, however, it should be said that some of these defects may be minimised if care is exercised in doing the work.
 Most of the large cities, boroughs, and towns in England have framed their building by-laws on those of the "Model By-laws" which are adopted by the Local Government Board; in these it states that the drain-pipes shall be "of glazed stoneware or of other equally suitable material." This, as interpreted, virtually excludes fireclay, as it cannot be from its nature equally suitable; its use by the Local Government Board is therefore prohibited.
 One of these fireclay drains came under my notice some few years since, in which the pipes used were supplied by a reputed London firm. The drain when laid would not stand the water test, and the result could be seen in the beads of water oozing through thickly all over the surface of the pipes. This drain, of course, was condemned and taken out, and stoneware pipes substituted.
 The author of the article, Mr. Samuel Smith, has made various tests with these fireclay pipes—viz., pneumatic, hydraulic, acid, etc.—

all of which have turned out apparently to his satisfaction. But has he not proved too much? For he admits in one case that a second quality pipe tested by the pneumatic pump was "very porous," and when encased in 6 in. of concrete, and the air pressure increased, there was still a leakage.

A further test of the strength of fireclay pipes was made by hydraulic pressure (which is the only agent that should be employed in testing), and even then the pipes were found to be porous. This is sufficient evidence, and tends to prove that pipes of this description are not fit to convey sewage matter.

The only point that can be conceded in their favour—and it is not always a meritorious one—is that they are cheap.

But is it any use pursuing this question of fireclay, or even stoneware, pipes further?

In my former letter I held (and it was not contradicted) that there was a consensus of opinion amongst observant men, sanitarians, and others, that the stoneware pipe as a material for house drains has in the past proved a failure; and although in theory the stoneware pipe forms a perfect drain, and should last for all time, yet, owing to its composition, and the physical agencies surrounding it, it has decidedly failed, especially in having no lasting properties.

My later experience since then still confirms that opinion, having again dealt with several decided failures.

My next point is the advocacy of cast-iron (porcelain-lined pipes), the best material we have at the present time for drains.

Mr. Samuel Smith states that "so long as cast-iron pipes can be kept free from corrosion, they may be regarded as being satisfactory for drainage purposes." But from the nature of his experiments on cast-iron pipes, and their preservatives, they are not to him satisfactory; although why a very weak solution of sulphuric acid attacked the glass-lined pipe, in one of his tests, it is difficult to say, when it is known that glass is not affected by the acid in question—in fact the acid is kept or stored in glass carboys, so that this glass-lined pipe was evidently a misnomer, and the test worthless.

Admitting some of these defects in cast-iron pipes, there is almost everything to be said in their favour—viz., superior strength and capability of resisting fracture, reduction in the number of joints (6 ft. and 9 ft. lengths compared with the 2 ft. and 3 ft. lengths of stoneware pipes), the greater security of the joints, which are run in molten lead, or Spence's metal, and do not injure the sockets by swelling, and are also absolutely water-tight.

The one objection, and perhaps the greatest, is their oxidation; this, however, may be yet overcome if our manufacturers will only rise to the occasion. The pipes, to be successful, should be glazed inside, and for this purpose they should be roughly bored through their entire length and to a defined gauge, then line with a coating of white porcelain enamel, burnt on so as to become almost an integral part of the iron, and left with a perfectly smooth finish. Large cast-iron baths, and other articles apparently more complex, are coated successfully with this porcelain, and the difficulty of treating cast-iron pipes in this way is not insuperable, especially with our advancing knowledge in metallurgy.

I should also like to reiterate what I formerly stated—that the drain of the future will be laid in a brick or concrete culvert, with stone cover and chambers for access, sufficiently large to admit a man (say, 3 ft. high by 2 ft. 6 in. wide) for the purpose of periodical inspection, so that the drain is at all times accessible and visible. The drain to be laid on blocks or bearers, about 9 in. above the floor of culvert, and at intervals of about 3 ft. apart.

At the least intimation or suspicion of anything being wrong with the drain, an examination can be made in a very short time, without cost, and it is at once seen whether the drain is doing its work safely and well or not.

It is admitted that this culvert system, and improved cast-iron drains, will add to the first cost, but it is a small matter compared with the advantage gained, and it is undoubtedly cheaper to incur this expense than to incur the expense of re-instating drains every few years, as at present found to be necessary.

The culvert may also be utilised for laying the water, gas, and electricity mains. This, too, would be a great advantage to a dwelling-house, as none of these mains should be covered

up and hid from view, as they are in a great many instances at present.

In conclusion, with all the advancement made in sanitary science, it seems a pity that a scheme such as this should not be universally adopted, for there can not be the least doubt that it would tend to the improvement of sanitation, and hence the health and well-being of the community.

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—The Council of the Institution of Civil Engineers have, in addition to the medals and prizes given for communications discussed at the meetings of the Institution in the last session, made the following awards in respect of other papers dealt with in 1903-1904:—Telford Premiums to Arthur Hill, C.I.E. (Bombay), F. A. Hinley (Cairo), E. M. De Burgh (Grestyones), H. H. Dare, M.E. (Sydney, N.S.W.), William Marriott (Melton Constable), T. G. Gribble (London), W. H. Haigh (Cardiff). For students' papers the awards are—A "Miller" Scholarship, tenable for three years, and the "James Forrest" Medal to C. W. L. Alexander, B.E. (Birmingham); Miller Prizes to J. M. Clark, M.A., B.Sc. (Glasgow), L. G. Crawford (Barrow-in-Furness), W. H. Dickenson, B.Sc. (Jesmond-on-Tyne), William Lawson (Newcastle-on-Tyne), C. G. Du Cane, B.A. (Middlesbrough), C. Gribble (York), J. E. Lister (Sheffield), J. M. Kennedy (London), H. Middleton (Newcastle-on-Tyne), J. D. Morgan (Handsworth).

Illustrations.

NEW CHAPEL, HERTFORD COLLEGE, OXFORD.



THE present chapel of Hertford College is a building of modern date, too small for the numbers of the College.

It has been difficult to find space in the confined area of Hertford College for a larger chapel; but by sacrificing one block of rooms, which can be spared in consequence of the new building on the other side of New College-lane, and utilising a small piece of waste ground next All Souls' College, a considerable chapel can be provided, though only a small part of it, as shown in the illustration. The east end will be well seen from the garden of the Warden of New College, on which it will abut, and also less conspicuously from New College-lane.

The architect is Mr. T. G. Jackson, R.A., and the drawing from which the illustration is taken was hung in the Royal Academy Exhibition this year.

HAGGERSTON PUBLIC BATHS.

THE accommodation provided in these baths includes a large swimming-bath, 100 ft. long by 35 ft. wide, and of a depth varying from 3 ft. 6 in. to 6 ft. Seventeen men's and five women's first-class and forty-nine men's and nineteen women's second-class slipper-baths, an entrance hall, 28 ft. by 16 ft., with a central ticket office, public cloak-rooms, a large swimmers' club-room, a public laundry fitted with sixty washing troughs and drying-horses, and five hydro-extractors, mangling and waiting rooms, a boardroom, and, in the attic story, residential accommodation for the superintendent. The boiler-house, the heater-room, the establishment laundry, and the store-rooms are placed in the basement floor.

In planning the swimming-bath an attempt has been made to solve the problem of enabling a large body of spectators to obtain an entirely unobstructed view of the whole water area of the bath. The ordinary plan under which the galleries for the public overhang the bath platforms is a very defective one, and, even when their stagirs' built on the raking lines of steel cantilevers or carriages inclined at an angle of about 45 deg. (as in the case of the Hoxton Baths), galleries so arranged are not wholly satisfactory. In the present instance the spectators' seats are in three stages, the lowest of which is placed about 18 ft. about the level of the bath platform, the dressing-boxes, sixty-nine in number, being arranged immediately behind the top stage of the public seating,

which is planned to accommodate about 100 persons.

The engineering plant comprises 2 Lancashire boilers, 28 ft. long by 7 ft. diameter, connected with the requisite condense pumps, steam injectors, and delivery pipes, valves, etc.; a Green patent fuel economiser, fitted with an electric motor for driving the scrapers, two large tubular reservoir heaters, and electric motor for actuating the wash-house machinery, the ventilating fans.

The general heating is effected by radiators placed in the various rooms and corridors connected with a low-pressure hot-water heating apparatus.

The walls of the swimming-bath hall, suites of slipper-baths, the public and establishment laundries, and the public corridors and staircases are faced, and the bath tank with enamelled bricks supplied by the Far Iron Company.

The arched roof principals of the swimming bath are of steel encased in ribs of gun plaster, the lower portions of the lantern are of glazed terra-cotta, supplied by Leeds Fireclay Company, fitted with iron joints, and the upper portions have fixed roofs and domes.

The bath platforms are paved with pebble interlocking rubber tiling, the gallery stairs are of oak, and the enclosure of the slipper-baths are formed with slabs of St. Anne's marble.

Messrs. Kilby and Gayford, of 87, Worcester street, E.C., were the general contractors, the constructional steel-work has been supplied and fixed by Messrs. Homan and Rodgers.

The engineering plant was installed by Messrs. Z. D. Berry and Son, and Messrs. Hemmingway and Pitt carried out the electrical lighting; the ornamental metal-work supplied by Messrs. Beulham and Froude, Thos. Easley, Ltd., and the ship vanes by Mr. George Wragge.

The figures, in low relief, on the pediment of the main front were modelled by Mr. J. Scheuk and carved by Messrs. Martyn and Co.

Externally the buildings are faced with Lawrence's red bricks and Portland stone.

Mr. H. Barton was the general foreman, F. C. Saunders the clerk of the works, and A. W. S. Cross the architect. The total cost of the buildings was about 60,000.

ADDITIONS TO OLD MILL, ALDEBURGH.

THIS is an illustration which shows how an old windmill was converted into a dwelling-house.

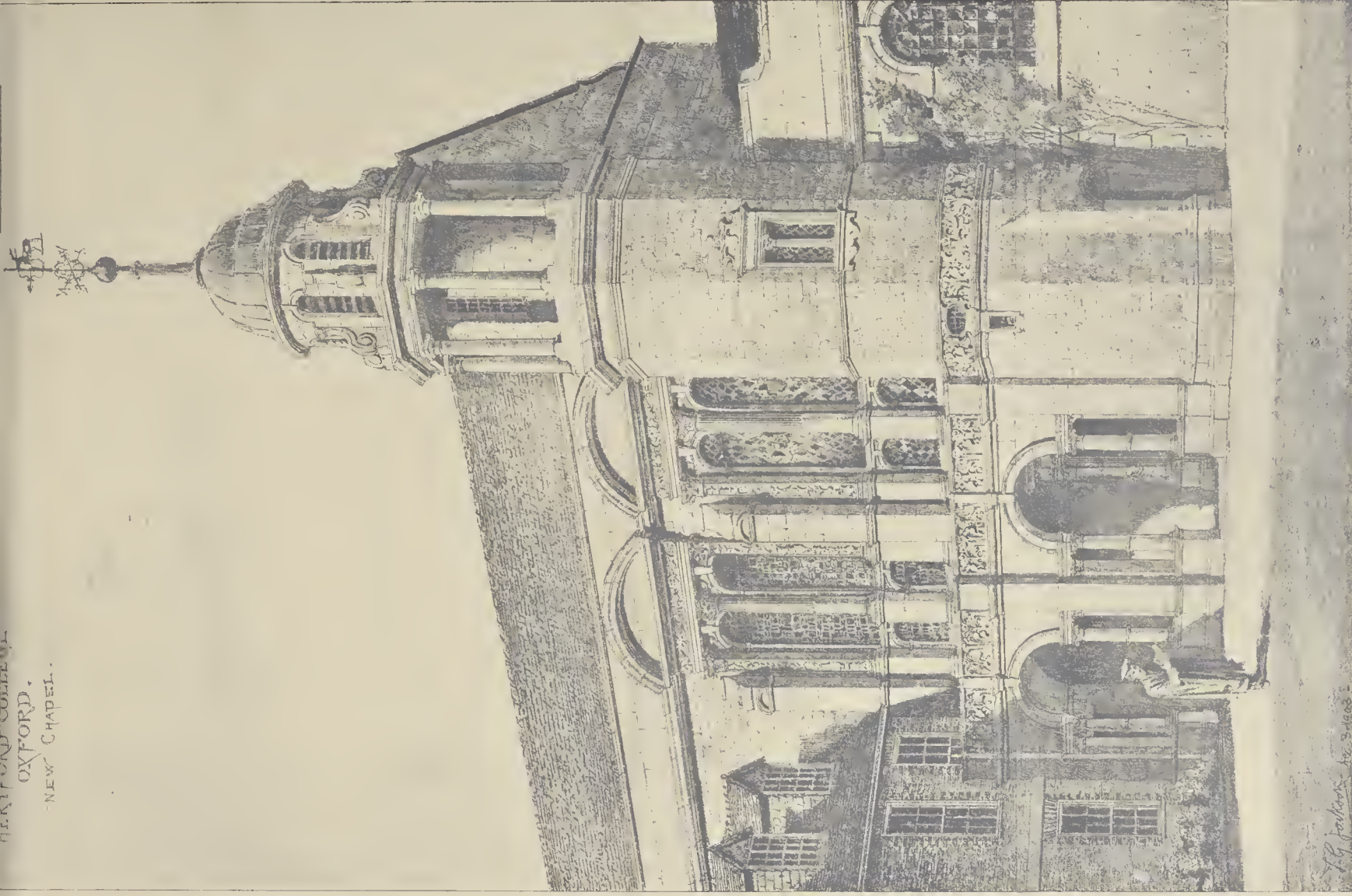
In the old mill a dining-room, three bedrooms and a smoking-room were contrived, approached by a new entrance-hall and staircase. These rooms were circular on plan. On the ground floor a parlour 30 ft. by 16 ft., built towards the east and south, approached a circular corridor, and on the north side of it were erected the servants' offices, bathroom and water-closet were arranged on first floor. The walls were faced with red cast, and the roofs were tiled, except the old mill, which for lightness was covered with copper. The woodwork, except the doors and shutters, which were bright green, painted white.

The contractor was Mr. G. O. Knowlton, Aldeburgh, and the architect, from whom this illustration was taken, Mr. J. Briggs, of London.

HAILEYBURY WAR MEMORIAL.—Since the publication of this last week we have heard from the architect, and may add a few more pieces of information which we were unable to obtain before. The materials are Portland stone and bronze, the convex panels on the face of the podium being of bronze, those on the east and west sides bearing Latin inscriptions, those on the north and south sides respectively the words "South Africa" and the "Sursum Corda" is the school motto, and a winged heart over it the school crest. Sixteen bronze plaques above bear the names of sixteen battles for which clasps were issued. The original idea was to put a bronze figure of the ball at the top; but this was abandoned.

The work was executed by Messrs. Fry and Brindley, the design being, as already mentioned, that of Mr. Reginald Blomfield.

TRINITY COLLEGE
OXFORD.
NEW CHAPEL.



J. G. Johnson del. 1848



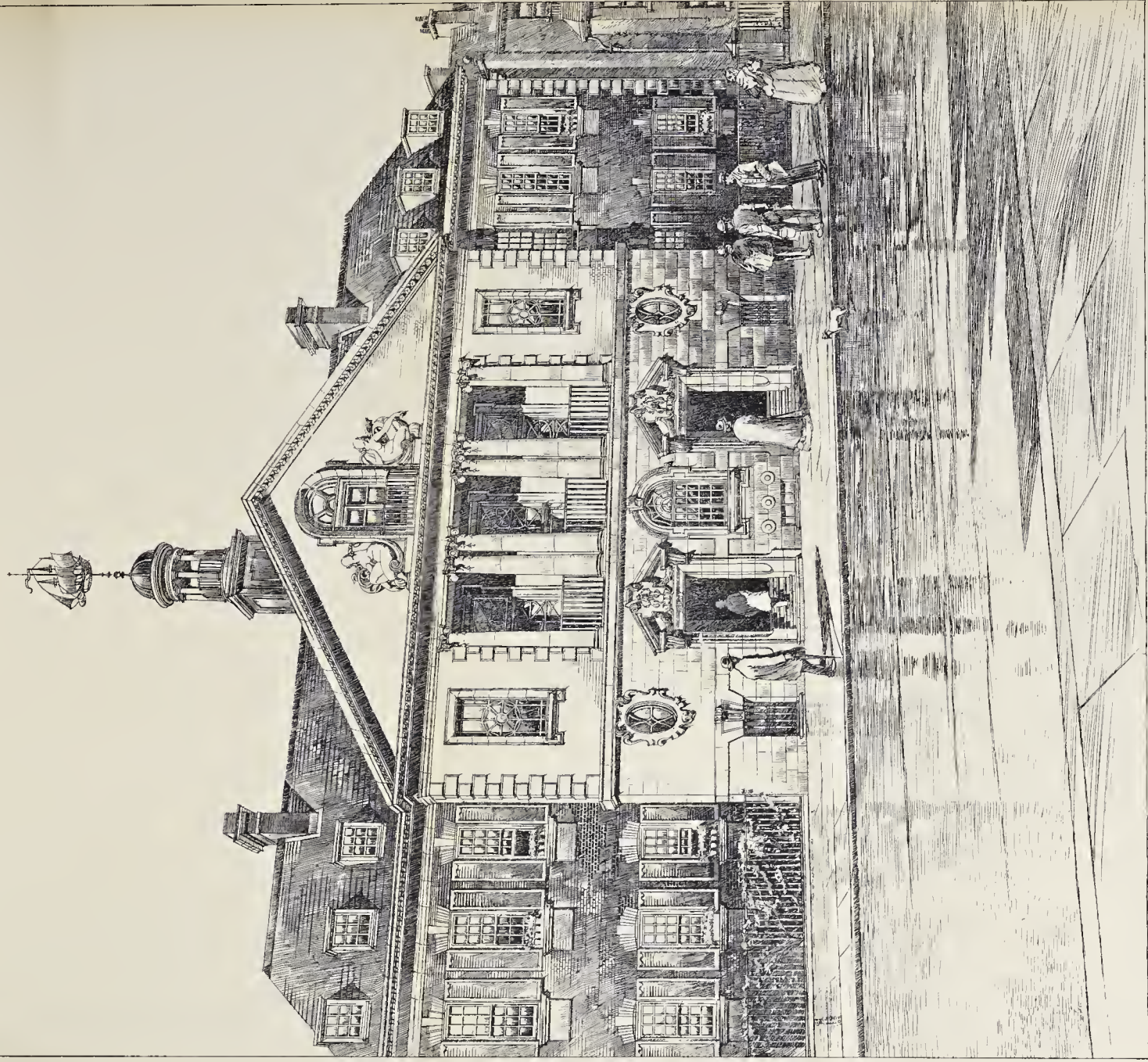
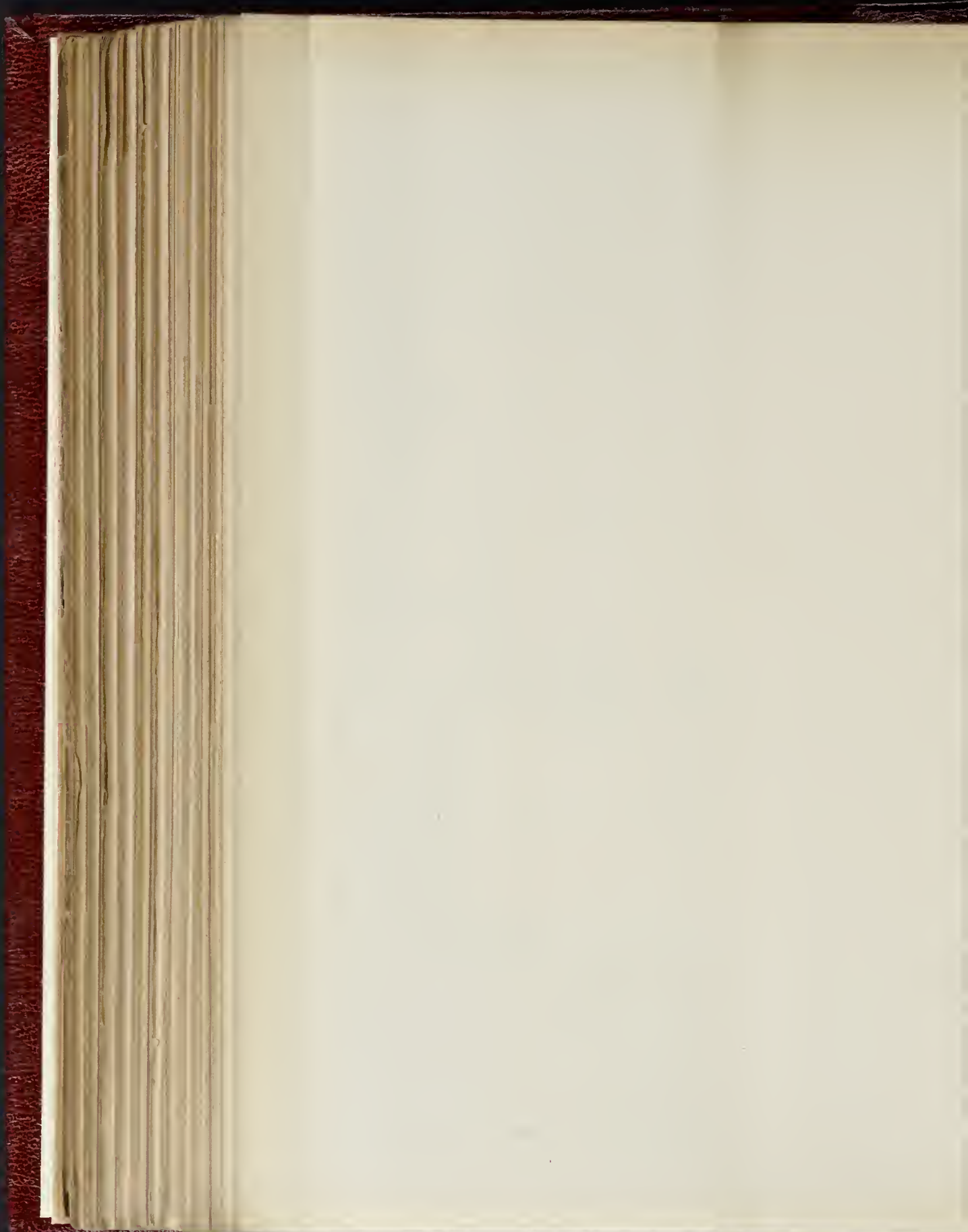


PHOTO LITHO SHIRAZEE & CO. 17, 48 & 51, HANCOCK STREET, FETTER LANE, E.C.

HAGGERSTON PUBLIC BATHS—MR. ALFRED W. CROSS, F.R.I.B.A., ARCHITECT.





ADDITIONS TO THE OLD MILL ALDEBURGH.
FOR THE REV. WILLIAM BLACK, M.A.
R.A. BRIGGS, F.R.I.B.A. Architect.



1903
R.A. BRIGGS
F.R.I.B.A.



Books.

Manual of Forest Engineering for India. By CHARLES GILBERT ROGERS, Fellow of Cooper's Hill, Deputy-Conservator of Forests, Imperial Forest Service of India. Calcutta Office of the Superintendent of Government Printing, India. 1900-1902.

THE ordinary architect or engineer the term forest engineering" will scarcely convey an adequate idea of the numerous subjects which are discussed in the large and comprehensive manual issued by order of the Indian Government. The first volume is devoted to building construction, the second contains information that should be found useful to all who are interested in comparatively simple engineering problems, and the third relates to matters more particularly appertaining to the duties of engineers in the forest service of India, or in countries where similar conditions prevail. The manual is divided into the following parts, viz.:—(1) Building Materials. (2) Building Construction. (3) Road Making. (4) Bridges. (5) Transport of Timber. (6) Wells. (7) Construction of Embankments and Water Channels, River Training Works. (8) Demarcation of Forests. The scope of the work was laid down in 1893 by the Board of Control of the Imperial Forest School, by whom the opinion was expressed that the general arrangement of the manual should be in conformity with the syllabus of the course of forest engineering. But it was further decided that the treatise should be elaborated beyond the actual requirements of the school curriculum, so that it might be useful for reference to the officers of the Forest Department and to the public generally. Although Mr. Rogers is the author of this work, he has to some extent occupied the position of an editor, for, being empowered to correspond with Conservators of Forests throughout India, he forwarded drafts of the different parts of the manual to various officers, inviting them to criticise the information collected, to indicate whether it was in accordance with their own practical experience, to add information where necessary, and to suggest what parts of the information were thought to be useless to forest officers or at variance with local practice. The effect of this course of action has been to make the work representative of the experience of the department as a whole, rather than of the views held by a single individual.

In considering the treatment adopted by the author, it must always be remembered that the engineering works falling to the lot of forest officers or landed proprietors in remote regions must usually be executed in the cheapest possible manner, and with the aid of somewhat primitive appliances. Further, in most cases such materials of construction can be used as are obtainable locally, owing to the prohibitive cost of transport. This condition frequently precludes the adoption of rolled steel, or castings, and other manufactured products. Consequently the reader will find that most of the types of construction described are those in which timber and other materials obtained on the site can be serviceably employed, while structures involving the use of iron and steel are only occasionally mentioned.

In noticing a work containing nearly a thousand pages and more than four hundred illustrations we cannot refer in much detail to the various sections, especially in view of the many different classes of work considered. Volume I, is, so to say, self-contained, being devoted entirely to "Building Materials" and "Building Construction." Part I, like all succeeding parts, is divided into sections, which are practically chapters, and are subdivided into paragraphs, numbered for convenience of reference. Sections I, II, and III relate to stone, bricks, and tiles respectively, and the treatment adopted by the author includes features that are absent from ordinary textbooks on building construction and civil engineering. Remembering that forest engineers have to quarry and otherwise prepare stone for use, the author gives detailed directions as to the most suitable methods for adoption, and adds a useful list of the available varieties of building stone found in India. Similarly, he gives full particulars of the processes of brick and tile making, including a discussion of the means to be adopted for determining the suitability of an earth for such purposes. Section IV, on "Earth, Grass, and Bamboos," is brief but interesting. When proper selection

is made, earth is certainly a most suitable material for the erection of temporary buildings of small size. By choosing earth with a large proportion of clay the whole construction is practically converted into sun-dried brick, but, as recommended by Mr. Rogers, the best way of preparing the material for the erection of walls is to form sun-dried bricks, and to lay these in mud mortar, the entry of water into the top being carefully guarded against by laying one or two courses of burnt bricks at the top of the wall. Some interesting particulars are given of the manner in which the materials here mentioned are applied in different parts of India. In the central regions white earth found on the sites of old villages is said to be the best for the construction of walls, and to stand exposure to the weather for many years; while for making mud plaster the earth from ant-hills is recommended, as it is believed that white ants will never attack plaster so prepared. In Assam reeds or split bamboos are much used in conjunction with sand and lime plaster in the erection of temporary structures. In Burma bamboo is largely used in place of earth for temporary buildings, and in other parts guard huts, stables, and other structures are often built entirely of grass fastened to timber frames. Section V, entitled "Lime," is one of much importance. The sources of lime are indicated, and the process of manufacture is clearly described and illustrated. Very little space is accorded to Portland cement, for the reason that its use is considered unnecessary in India, except where great strength or rapidity of setting is required. The remaining portion of this section is occupied with applications of lime in the forms of mortar, concrete, plaster, whitewash, and distemper. Full instructions are given relative to the proportions and mixing of such compounds, and it would be difficult for anyone of ordinary intelligence to go far wrong in such matters if carefully following the directions of the author. "Timber," forming the subject of the succeeding section, is of equal importance, and is considered at some length. Although a good deal of attention is paid to points more particularly concerning those practising in India, there is much information in this section that should be appreciated by all who have occasion to make themselves familiar with the nature of wood, with the best season and methods for felling trees, and with the most approved methods of seasoning timber. The conversion of timber, the suitability of different kinds of wood for the various parts of a structure, the causes of decay, and the preservation of timber are among the other questions discussed in this excellent section of the manual, which is followed by another section descriptive of the more important timber trees to be found in different parts of the Indian empire, information that will doubtless be highly prized by forest engineers and others in that country. After Section VIII, dealing with paints and varnishes, the subject of "Carpentry and Joinery" is taken up, and, although a little out of place in Part I, it has been included therein, as the author tells us, simply for convenience of reference. Many of the joints described may be required either in the construction of floors and roofs, discussed in Part II, or in the construction of bridges, considered in Part IV, and so they could not be relegated to either of these portions of the manual. This difficulty might have been got over by constituting the section a separate part, which, although short as compared with the others, would have enabled the author to avoid the inconsistency now existing. The section itself is admirable, and its practical utility is much enhanced by the drawings with which it is illustrated. Most of the latter are reproduced to scale, and many of them include figured dimensions. But, in addition to describing various timber joints, this section contains a concise summary of some points relating to the physical properties of matter and the loads and stresses to which structural members are subjected, as well as particulars as to the design and construction of doors and windows of different kinds.

In Part II, Mr. Rogers treats of "Building Construction," commencing with foundations, and proceeding upwards to the roof. As may be anticipated, there is nothing very novel in the treatment to be found in this portion of the manual, except with regard to such points as are particularly applicable to Indian practice. In this respect the author has certainly succeeded in collecting a mass of valuable informa-

tion, which is presented in an admirable manner. Moreover, the various details of a building are most thoroughly dealt with, so that this part of the work is well worthy the attention of all requiring guidance in the design of temporary or permanent buildings of simple character. In dealing with lightning conductors, the author does not emphasise so much as could be wished the desirability of establishing a complete system of protection over all parts of a building. It is true that he says the lightning conductor "should be connected with the more prominent lines of the building, such as the ridges, hips, and eaves of the roof," but he gives no directions as to the manner in which the connexion should be carried out, or as to the fitting of points, or clusters of points, along the horizontal conductors. The provision of a conductor or conductors projecting "about 5 ft. into the air from one or more of the highest points of the building," cannot be regarded as sufficient for adequate protection under all circumstances, even if we accept the theory that "a lightning conductor will afford protection over an imaginary cone having the point of the conductor for its apex and a base on the ground, the radius of which is equal to twice the height of the conductor above the ground." But, as pointed out in the report of the Lightning Rod Conference, as long ago as 1882, the rule in question cannot always be relied upon. Again, the author says:—"Lightning conductors should, where practicable, be made of copper, as that metal conducts electricity very readily." This recommendation involves unnecessary expense, and need not be followed in forest lands where the air is free from the corrosive constituents found in the atmosphere of large cities. Iron is an excellent conductor, as efficient as copper if the sectional area is properly proportioned, and it can easily be protected from corrosion by galvanising. Another very important matter, rather lightly touched upon, is the earth connexion. The ordinary earth plate is recommended in the present treatise, but there are frequently objections to this device. It is often impossible to bury the plate deep enough to insure the constant presence of moist earth, and the connexion of the conductor with the plate generally becomes impaired after the lapse of a few years.

Volume II. is devoted entirely to those prime essentials of every new country—roads and bridges. In forest lands, roads and paths are required for various purposes, such as the transportation of produce, ordinary traffic, and for the use of inspectors. The education of a forest engineer in road-making is naturally of far wider scope than that obtaining in settled countries like Great Britain, and includes the design of "fair-weather roads," "cart roads," "dragging roads," "camel roads," "bridle paths," and "inspection paths." The forest engineer must also be prepared to deal with streams crossing roads in places where bridges are not required, and to cope with various difficulties which are never encountered by road builders in civilised lands. The science of road-making is most thoroughly discussed by Mr. Rogers in Part III. of his manual, and the instructions there given cover all theoretical and practical points necessary for study. In treating of "Bridges," in Part IV., the most simple forms of construction are selected as examples, for, as a general rule, Indian forest officers are rarely required to construct bridges of large span, and, owing to the fact that forest produce is chiefly carted across the beds of torrential streams during the dry season, bridges are not often built even strongly enough to carry loaded carts. These being the prevailing conditions, the author devotes most of the present section to "simple wooden bridges" and "simple wire-rope bridges," the remainder being occupied with the description of elementary forms of the cantilever bridge and a brief discussion of masonry bridges and culverts. Those who desire more advanced engineering can easily obtain it in various excellent text-books, but it should be pointed out that these do not profess to convey the minute and practical instruction as to actual details which are to be found in the manual now before us. In Volume III. there is a very complete treatise on the "Transport of Timber and Firewood," in which are considered methods of conveying material on ordinary roads or paths, on rolling roads, sledge roads, and tramways, in specially-prepared troughs and slides, and by wire-rope ways, as well as by water. To all who are

interested in these various means of transport, we commend the careful study of the manual itself. The remaining portion of Volume III. contains adequate information relative to the construction and management of wells, the construction of dams, weirs, and water channels, the protection of river banks, and concludes with a description of the methods to be adopted for that most important branch of work—the demarcation of forests. In addition, there are six appendices to this volume relative to examples of sledge roads, forest tramways, wet slides, and wire-rope ways.

It would be difficult to conceive a more complete exposition of the many duties pertaining to the forest engineer than the present work, which, as we have already said, possesses distinct value to various sections of the community, other than that to which it is directly addressed. Although not intended as a substitute for existing text-books on civil engineering and building construction, the manual possesses a distinct sphere of usefulness, for it conveys what may be termed supplementary information, which, in many cases will enable landowners and occupiers to execute simple engineering works in places where they are compelled to rely upon their own resources. As a text-book, it will be found of much value to students, especially to such as desire to prepare themselves for constructional work abroad. From beginning to end the work gives ample evidence of the great care bestowed on the compilation and arrangement of the material, and the manner in which the task of the author has been accomplished deserves the highest commendation.

BOOKS RECEIVED.

THE ALHAMBRA. By Albert F. Calvert. (Geo. Philip and Son. 2s.)

TRANSACTIONS OF THE INSTITUTION OF CIVIL ENGINEERS OF IRELAND. Vol. XXX. (Dublin: John Falconer.)

THE PLUMBERS COMPANY'S DIAGRAMS; for the USES of Classes of Technical Education for Plumbers. (Published by the Plumbers' Company.)

TRADE CATALOGUES.

THE United Telpheage Company, of New York, send us two circulars describing and illustrating some applications of the "telpher" system. Strictly speaking, the word "telpherage" designates all modes of transport effected automatically by the aid of electricity, but as used by the company mentioned above it simply denotes a particular system intended for the conveyance of materials and merchandise for short distances. The first illustration in one of the circulars shows the telpher with a coke-quenching basket over the quenching tank in a gasworks; the coke is pushed from the ovens into the basket, hoisted, conveyed to the tank, quenched, and conveyed to the coke pile upon which it is dumped. All these operations are controlled from the ground level, the load being 12,000 lb., the speed of hoisting 60 ft. per minute, and the speed of conveying 800 ft. per minute. In this case the track is carried on rigid steel supports, but in an installation illustrated on the next page a wire ropeway is employed. The same circular illustrates several ingenious variants of this system, and the second circular describes an extensive plant erected in America for transporting bags of cocoa beans from a storehouse to the mill situated on the opposite side of a river. The track is supported on solidly built frames of Georgia pine, except where it crosses the river by the aid of a steel girder bridge. A train consisting of three trucks, one with a motor cab for the driver, conveys the material at an average speed of 700 ft. per minute, and performs as much work in a day as formerly required the employment of many men and teams of horses.

Messrs. R. Johnson, Clapham, and Morris, of Manchester, send us their catalogue of the Johnson-Ammon steel wire concrete lattice, which is made in rolls 6 ft. wide by 120 ft. long, or in panels or sheets to specified size. Being formed of hard steel wire, about $\frac{1}{8}$ -in. diameter, this netting is extremely strong, and as it is supplied in rolls the cost of placing it in position for concrete-steel construction is small as compared with that of arranging separate rods or sheets. The lattice is quite suitable for almost all forms of concrete and plaster work. One illustration in the catalogue represents the laying of the Johnson-Ammon lattice at the

Savoy Hotel extension, where it has been extensively used for the reinforcement of concrete floors.

The Lucal Light and Heating Company, of Glasgow, send us a reprint of the report made by Professor Watkinson upon their system of oil firing, as applied to a marine boiler at the Princes Dock Power Station of the Clyde Trust. Three of the Lucal patent burners were fixed in each of the two furnaces of the boiler, and the fuel used throughout was blast furnace oil, containing only 17,600 heat units per lb. It appears that the combustion was practically perfect and almost smokeless. The oil was sprayed by means of a steam jet, 0.21 lb. of steam being required for each pound of oil consumed. The average effective evaporation was 13.65 lb. per lb. of oil, which, considering the low calorific value of the fuel, the temporary and somewhat imperfect manner in which the burners were applied, and the unfamiliarity of the operators with the working of the apparatus, must be considered as an eminently satisfactory result.

Correspondence.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

STR.—It has been found desirable to defer to a future date the Institute visit to Newcastle and the annual dinner, which were to have taken place early next month.

W. J. LOCKE (Secretary).

HAND-POWER MORTAR MILLS.

STR.—Can any of your readers give me practical information of the utility of a hand-power mortar mill? Would it be of use for making mortar with furnace ashes? What is its average output?

I only want the mill for small jobs; sand is very costly to get in this district. If any reader has had practical experience with a hand-power mortar mill, any information he can give on the subject will oblige.

G. PASSMORE.

The Student's Column.

NOTES ON PORTLAND CEMENT.

CHAPTER VIII.—HARDENING AND TIME OF SETTING.



HE setting of cement is its change from a fluid to a solid state. The time taken for this change is the "time of set." Just as the composition of Portland cement is very indefinite, so the cause of this change has not been determined. By some the hardening process is supposed to be a chemical combination; others believe it to be a physical process. In reality, only two substances take part in the hardening of cement—viz., silica and lime. All the other constituents, as alumina, oxide of iron, magnesia, etc., although each playing a part in the process of hardening, strictly taken, are not capable of hydraulic action with lime.

Dr. Michaelis, in a paper read before the "Society for the Unification of Methods of Testing Technical Materials," advocated the view of a physical process. He says, "In order to gain an insight into the process of hydraulic hardening one must study first the influence of hydrate of lime on hydraulic silica, then upon alumina and oxide of iron, which three substances have been designated by the general term 'hydraulic factors.'" Dr. Michaelis's arguments were founded on the following facts:—If dried hydrate of silica be mixed at the ordinary temperature with lime paste, in a few minutes the mass is observed to coagulate and then to harden; if strongly-ignited silica be mixed with lime paste, then after a longer time, but still within twenty-four hours, the mass is seen to coagulate and gradually harden. If air-dried hydrate of alumina or ignited alumina in fine powder be mixed with lime paste, similar coagulation and hardening takes place. Lime paste treated in the same manner with finely-powdered ferric hydrate acts in the same way, but in a slight degree.

If lime-water kept saturated by suspending a piece of lime in it be allowed to act on hydraulic silica, a hard shell of hydrosilicic acid and a soft core of hydrosilicic acid is obtained. Hydrate of alumina is acted on in a similar

manner, giving hydroaluminate of lime and a core of hydrate of alumina.

With ignited ferric oxide no action takes place, but ferric hydrate forms a white crystalline substance in which the lime is only loosely held, so that it is quickly decomposed by water. Polarised light shows the hydro-silicate of lime to be a structureless mass and not crystalline. The hydro-aluminate and hydro-ferrate, however, prove to be crystalline compounds. The hydro-silicate of lime strongly resists the action of water, especially if not too rich in lime. On the other hand, hydro-aluminate of lime and hydro-ferrate are very easily softened and decomposed by water. Silica is, therefore, not only the most essential but, strictly speaking, the only constituent of cement which can be looked on as the hydraulic factor.

Lime-water enables silica, alumina, and oxide of iron to take up water of hydration, which hydrates are very rich in water. For example, silica thus treated will form a compound $5 \text{SiO}_2 \cdot 3 \text{CaO} + 40 \text{H}_2\text{O}$, which when dried over sulphuric acid will give a compound $5 \text{SiO}_2 \cdot 3 \text{CaO} + 5 \text{H}_2\text{O}$.

Finely-polymerised alumina treated with lime-water and pressed shows a composition $5 \text{Al}_2\text{O}_3 \cdot 7 \text{CaO} + 58 \text{H}_2\text{O}$, and when dried over sulphuric acid $5 \text{Al}_2\text{O}_3 \cdot 7 \text{CaO} + 23 \frac{1}{2} \text{H}_2\text{O}$. Lime paste consists of different hydrates, from the monohydrate to that with $8 \text{H}_2\text{O}$.

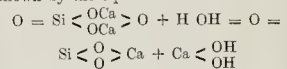
The process which takes place, therefore, when silica, alumina, or oxide of iron and lime paste are brought together is that water of solution is taken up, producing coagulation or setting, but that possibly the silica takes up water from the higher hydrates of lime, penetrates the lime paste, and separates out monohydrate of lime. In this expanding action the silica especially must penetrate the spaces previously filled with water, and in so doing envelop the lime molecules. Thorough combination with water cohesion is effected, which is greater if the water is absorbed from the gelatinous polyhydrate of lime, and the fact that the stable monohydrate of lime separates out in the hydraulic hydrates combines with them ensures solidification.

Pure clay ($\text{Al}_2\text{O}_3 \cdot 2 \text{SiO}_2 + 2 \text{H}_2\text{O}$) is too stable a compound to be acted on by lime hydrate, but, if heated to cause partial dissociation, will harden hydraulically.

With Portland cement the hydraulic hardening is very much more complicated. When mixed with water the aluminate of lime sets first, and under the influence of the separated lime the process of hydration, as just explained, goes on. Cement is to be regarded as silicate of alumina decomposed by lime. The quick setting is caused by the aluminate of lime, which takes up water immediately, giving out much heat; the slow setting is caused by the hydration of the silica and lime compounds.

Dr. Michaelis says that "the setting is solely a process of water absorption; the real strengthening results first from the union of hydrate of lime with silica, brought about by surface attraction, and from the crystallising compounds of lime with alumina and oxide of iron. This process takes place gradually, in proportion to the swelling and filling up of the interstices on the part of the lime compounds formed. Hence it appears to be a necessity that the lime should be present in excess during the absorption of water, for, if the silica has only completed its hydration under the influence of lime solution, it furnishes only a soft water mass; if, however, during its hydration it is surrounded with solid monohydrate of lime it consolidates.

According to Zulkowski, who holds that the greater part of cement consists of metasilicate of lime, when the cement is mixed with water the metasilicate is decomposed with formation of monocalcium silicate and hydrate of lime as shown by the equation:—

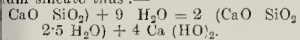


The hydrate of lime causes the monosilicate to swell, and the increase of volume causes bending to take place.

According to Rebuffat, the chemistry of the hardening process consists in the hydration of orthosilicate of lime with production of a body having the following composition:— $2 (\text{SiO}_2 \cdot 2 \text{CaO}) \text{H}_2\text{O}$. Hydration of calcium aluminate at the same time takes place. The lime in combination with the orthosilicate is set free and forms crystalline hydrate of lime. Metasilicate when present does not hydrate, but

into combination with the aluminate of forming double compounds.

ording to Le Chatelier, the structure cement is that of crystallised hydrate in a mass of hydrated monosilicate $[(CaO SiO_2) 2.5 H_2O]$ formed from the um silicate thus:—



Chatelier also advanced the view that phenomena of supersaturation plays an ant part in the setting of cement—that hydrated compounds formed on addition r pass through a state of solution. When solution has become supersaturated, lication or setting takes place.

iewing the theories propounded it will ed that the views of the different exper- ers are founded on their ideas regarding omposition of cement. Le Chatelier s that tricalcium silicate is the chief out, Rebuffat that it is calcium ortho- , and Zulkowski metasilicate. For want of a purely chemical process, and on und of failure of all attempts to prepare ilicate of lime in the wet way, Michaelis d to the view that the hardening was f a physical process depending on surface ion, similar to the dyeing or tanning s.

as prepared animal skin precipitates b hydraulically-expanded silica separates hydrate of lime in itself, forming a hard ul glue.

METROPOLITAN ASYLUMS BOARD.

first meeting after the vacation of the gers of the Metropolitan Asylums Dis- was held on Saturday last week at the e of the Board, Victoria Embankment.

FIRE HOSPITAL.—The Hospitals Com- reported having considered reports by gineer-in-chief on the condition of the one and fire alarm systems at this al. The reports stated that the fire ystem at the Upper Hospital was of ewhat crude nature, and the engineer sed that there should be a central ind- board, and that each block should have connected therewith. The cost of the s was estimated at 350*l.*, and, on the mendment of the committee, it was id to carry out the necessary improve-

WESTMINSTER ASYLUM.—On the recommendation e Works Committee, it was agreed to a small scullery to the matron's new- ers at this asylum. The cost was esti- at 80*l.*

THE OAK SCHOOL.—Plans, prepared by the gineer-in-chief, and showing the additional e accommodation which it is proposed to le at this school, were adopted.

OBITUARY.

JAMES SELLERS.—On the 3rd inst. Mr. a Sellers, architect, of Bury and Rad- died suddenly at his residence, Sunny t, Radcliffe. The deceased had erected d of the public institutions of Bury.

GENERAL BUILDING NEWS.

ST. PATRICK'S CHURCH, KILCAR, IRELAND.—The new h, which has been erected at Kilcar, was d on the 4th inst. The building is ed in the Romanesque style. The al walling is of local freestone from Quarries, and the nave arcade is of ame stone. The church affords seating modation for some 1,200 persons. The is spanned by a timber barrel vault, ill be stained a clear malachite green ightly varnished, the principals being d out in cream colour for decoration. arcade consists of six bays of circular rches, carried on circular cut stone- s, with moulded bases, the capitals d with Irish interlaced ornament. The ws are filled with lead lights in Celtic s, made by Messrs. Ward, of Belfast. oofs will be covered with small, thick, rey-green slates from the Killarney es. A feature of the west front is the ed entrance doorway and the three-light w over it. Messrs. Harrison, of Dublin, the contractors for the altar rails, and s. Fagan, of Dublin, for the wrought-iron e. The high altar has been executed by s. P. Sheridan, of Dublin. The architects Messrs. Doolin, Butler, and Donnelly, of n, and the contractors Messrs. Campbell on, of Belfast.

REPAIRS OF PARISH CHURCH, ACLE, Lincs.—The reopening of the Acle parish y, after being restored, took place y. The outside of the roof has been

stripped and retatched, and the underside of the roof timbers have been clad with oak boarding, adorned with carved bosses and moulded oak ribs. The walls, windows, buttresses, and copings have been repaired, and the walls coloured inside. A carved oak pulpit on stone base has been placed on the north side of the nave. The work has been carried out from designs by, and under the superintendance of, Mr. Herbert Green, architect and diocesan surveyor of Norwich, and the contractors have been Messrs. Chaston and Grimson, of Loddon. The fabric of the tower and north porch needs repair, and is the next work to be taken in hand. The cost of the work now completed has been about 600*l.* The estimated cost of restoring the tower is 350*l.*, and the north porch 200*l.*

NEW BAPTIST CHURCH, NEWPORT.—A new Baptist church was opened on the 1st inst. in Llanthwy road, Newport. The building, consisting of a school-hall with classrooms, occupies a site at the corner of Spencer-road. Messrs. Habershon, Fawcner, and Co., of Newport and Cardiff, were the architects. The building is in the Early English style, and is faced with local stone and Bath stone dressings. The school-hall is 55 ft. long by 32 ft. wide, and two vestries or classrooms are provided on the same floor. The rostrum and other woodwork are in pitchpine, and under the rostrum a baptistry is provided. The windows are glazed with cathedral-tinted glass. The contract for the building amounted to 1,897*l.*, and has been executed by Mr. Charles Shapland, contractor, Maindee.

WESLEYAN CHAPEL AND SUNDAY-SCHOOL, BENTHAM, YORKSHIRE.—A new Wesleyan chapel and Sunday-school was opened recently at Bentham. The interior of the chapel has a length of 66 ft., a width of 35 ft., and a height of 36 ft. Accommodation is provided for 300 persons. There are two aisles, with an organ chamber and choir seats at the pulpit end. The schoolroom is 48 ft. long by 24 ft. 6 in., and is divided into six classrooms. The buildings have been erected from plans prepared by Mr. J. F. Curwen, architect, Kendal, and the contractors were:—Mason work, Messrs. Brassington, Settle; joiner, Mr. Brear, Morecambe; plumber, Mr. Greenop, Bentham; painter, Mr. W. Holmes, Bentham; slater, Mr. Jackson, Bentham; plasterer, Mr. Anderson, Morecambe. The cost has been 3,000*l.*

NEW SYNAGOGUE, BELFAST.—The consecration of the new synagogue at Belfast took place on the 31st ult. The building stands on a site in Annesley-street. Access is obtained to the ground floor through a vestibule with tiled floor and dado. The seats are arranged so as to face the reader's platform, which is octagonal on plan, and was formerly used in the old synagogue. Accommodation will be provided for 500 persons on the ground floor, with a gallery holding 200 in addition. Above the vestibule is a minor hall approached from the gallery staircase. A simple treatment of the early round arched style, with stone dressings sparingly introduced, has been adopted. Brick pilasters are placed between the windows. A dado of blue bricks is used along Annesley-street, and the main porch is of cut stone. The windows have leaded lights, by Messrs. Ward and Parkes. The internal woodwork is principally of pitchpine varnished. Messrs. Musgrave and Co. Ltd., have installed their low-pressure system of heating. The electric lighting has been done by Messrs. Smith and Parkes. Mr. John Dowling has carried out the plumbing work. Messrs. James Henry and Son, Belfast, have carried out the contract. The architects are Messrs. Young and Mackenzie, while Mr. B. S. Jacobs, Hull, has acted as consulting architect. The cost of the work has been about 3,000*l.*

MARISCHAL COLLEGE, ABERDEEN.—The new entrance gateway of the Marischal College is being decorated with a heraldic scheme which will illustrate the history of the separate colleges and the united university. Seven coats-of-arms have been cut in simple relief in granite. In the centre of the archway is the coat-of-arms of the Aberdeen University. On the left side of it is the shield of Bishop Elphinstone, the founder and first Chancellor of King's College, the older of the two foundations, with the motto "Non confundar." On the right of the centre are the arms of George V., Earl Marischal, and his Countess, Margaret Home, the founders of Marischal College, the junior of the two foundations, of which the Earl became first Chancellor, with the motto "Veritas vincit." Above the shield is placed an earl's coronet. To the left of the Elphinstone shield are the arms of Old Aberdeen, the site of the older foundation, with the motto "Concordia res parvæ crescit." To the right of the Earl Marischal's arms are the arms of Aberdeen, the site of the younger foundation, with the motto "Bon-Accord." Then, to the left of the Old Aberdeen shield,

are the arms of Lord Strathcona and Mount Royal, the present Chancellor. The coat-of-arms has a baron's coronet above it, while below is the motto "Agnina duens." To the right of the Aberdeen shield is the coat-of-arms of the late Dr. Charles Mitchell, the greatest of recent benefactors to the university; above it an esquire's helmet, and below the motto "Spernit humana." Returning to the centre, there is the coat-of-arms of the united University of Aberdeen—quarterly, first King's College, second the Earl Marischal, third Bishop Elphinstone, and fourth Aberdeen, with the motto "Initium sapientiæ timor Domini." The whole of the interesting heraldic scheme was carried out from designs by Messrs. A. Marshall Mackenzie and Sons, architects, under the suggestions of Mr. P. J. Anderson, LL.B., librarian to the university.

PUBLIC BATHS, MANCHESTER.—Plans have been prepared by Mr. H. Price, the City Architect, for the proposed new baths which are to be erected on a site between Ashton New-road and Ashton Old-road, in the Bradford Ward, Manchester. The first-class males' swimming-bath will have a water area of 75 ft. by 30 ft. Along the gangways will be fifty-eight dressing-boxes. The second-class swimming-bath will have an area of 75 ft. by 35 ft. There will be seventy-seven dressing-boxes, and at one end of the bath there will be a dressing-room for children. Connected with each bath there will be the usual foot-baths and shower-baths. The wash-baths will be on the respective balconies, and there will be twenty-four first class and twenty-six second class. A further provision is a bicycle-room in the basement, which will be approached by means of an inclined way. There will be one swimming-bath for females, with a water area of 75 ft. by 30 ft., and fitted with sixty-five dressing-boxes and foot-baths and shower-baths. On the first floor over the entrance will be six first-class wash-baths, and on the balcony around the swimming-bath twenty-seven second-class wash-baths. To each set of wash-baths a toilet-room will be provided. The proposed buildings also include a public hall, 87 ft. by 50 ft., with seating accommodation on the ground floor for over 800 persons, and extensive platform. The gallery will seat eighty-one persons. Adjoining there will be a crush and lounge hall, 76 ft. by 21 ft. The large hall will have three extra exits at different parts. There will also be two ante-rooms. On the first floor there will be a room 42 ft. by 27 ft., which may be used for various purposes. A conspicuous feature of the new buildings will be a chimney 120 ft. high.

LIBRARY AND TECHNICAL INSTITUTE, BELFAST.—At the meeting of the Library and Technical Instruction Committee, held in the Town Hall, Belfast, on the 1st inst., a report was submitted by Mr. Samuel Stevenson relative to the progress of the new municipal technical institute. The following is an extract from the report:—"The contractors have now raised the building up to the level of the fourth story, and this means that they have built two storeys during the past nine months, or, in other words, 20,500 super. ft. of facing. The majority of the joists of this floor are laid, and a considerable portion of the concrete, the large beams over the central hall are in their places, and the joists on, and preparations are advanced for concrete, the principals for the chemical laboratory over same are all ready, and I hope that these will be in their places and the roof covered in by Christmas. The contractors have a large portion of the stonework for the fourth story ready to set. There has been a difficulty in procuring a number of large stones for angle pilasters, but this has been got over, and a cargo of large stones is expected in a short time. I may say that I visited the quarries to the north and about this morning. The floors of all the different stories are laid with concrete, and also the staircases, and this will much shorten the completion of the building when the roof is on. The caretaker's house is completed, and the asphalted roof over same, and hoiler-house, etc., are now being completed. For the past six months or so a part of the ground floor on the south side has been occupied by classes, and I expect that a much larger portion also will be completed, and will be ready for classes on September 7."

NEW BANKING PREMISES, DUBLIN.—The new premises of the Northern Banking Company in Grafton-street are now nearing completion. The frontage of the building is about 65 ft., and the height of the stonework is 73 ft. The building, which will include the bank proper, manager's house, and bank chambers, is a classic design with a Corinthian order. The hall is laid with mosaic, and a stone staircase leads up to the upper portion of the building. The work has been carried out by Messrs. Henry Laverty and Son, contractors, from the designs of Mr. W. H. Lynn, architect, of Belfast.

PUBLIC LIBRARY, BRANKSOME, DORSET.—The new library at Branksome was opened a short time ago. The building is situated at the corner of Shillito-road and Lake-road, on a site measuring 181 ft. by 102 ft. The exterior dimensions of the building are 69 ft. by 42 ft., and the ground around the building will be laid out as gardens. The exterior is faced with Milton brick, with Bath stone dressings, and the roof is of brown tiles. The entrance doors of panelled oak open into Lake-road. The hall, which is entered through swinging glass doors, is 66 ft. long by 26 ft. wide. The librarian's desk and enclosure faces the entrance, and on the left hand is the general reading-room, about 28 ft. square, and on the right the juniors' reading-room, 28 ft. by 16 ft., with the lending library at the rear, containing shelving for 6,000 volumes. Behind the central desk is the reference room and the librarian's room, with offices adjoining. The interior is arranged as one large hall with panelled roof, with dwarf glazed partitions, forming the separate departments. The architect was Mr. S. J. Newman, the District Surveyor, and the building has been carried out by Messrs W. E. Jones and Son, contractors, of Bournemouth.

NEW COUNCIL BUILDINGS, COWDENBEATH, N.B.—A site has been secured in High-street, Cowdenbeath, for the erection of new town council chambers. The property will have a frontage to the street of 52 ft., while the first floor will provide for the town clerk's private office and general offices, and the burgh courtroom, 29 ft. by 15 ft. Attached to the courtroom is the magistrates' apartment, while accommodation is provided for witnesses. A staircase leads from the centre of the entrance hall to the first floor, which is occupied by the council chamber, measuring 29 ft. by 22 ft. There are also offices and committee rooms. A heating chamber is situated in the basement. The front of the building will be finished in Dunfermline granite. The contractors for the various works are:—Mason, Mr. John Summerville, Cowdenbeath; joiner, Messrs. Bogie and Nicol, Kirkcaldy; plumber, Mr. Sidney Binning, Cowdenbeath; slater and plasterer, Messrs. John Paul and Sons, Cowdenbeath; tile work, Messrs. Haddow, Forbes, and Co., Edinburgh; steel work, Messrs. Blayden and Co., Glasgow; glazier, Messrs. John Haxton and Co., Kirkcaldy. The architect for the work is Mr. T. Hyslop Ure, of Dunfermline.

STAINED GLASS AND DECORATION.

NEW WINDOW, WELLINGTON CHURCH.—On the 17th a new east window at this church was dedicated. It is a three-light window, with a figure of Christ in the centre light, and figures of St. John the Baptist and the Prophet Isaiah. The left light contains the New Testament saints—St. Matthew, St. Mark, St. Luke, St. Mary Magdalene, St. Elizabeth, St. Peter, St. Paul, and St. John, with the Virgin Mary, while in the right light are Old Testament figures—Aaron, Daniel, Elijah, Joshua, Jacob, David, Abraham, Noah, and Moses. The window was designed and executed at the studio of Messrs. Mayer and Co., London.

SANITARY AND ENGINEERING NEWS.

THE WATER SUPPLY OF THE HARTLEPOOL.—The Hartlepool Gas and Water Company obtained powers a year or two ago to carry out considerable works for giving additional water supply to East and West Hartlepool, and have spent 68,000*l.* on the extension of works supplying water for commercial purposes, the other portion of the work being the enlargement of the storage for the West Hartlepool domestic supply, together with an additional pumping apparatus, and a new engine and engine-house. The new storage reservoir for the trade supply, on a site at Crookfoot, has a storage capacity of 200,000,000 gallons. A five-mile conduit will convey the water to the towns. The construction of the reservoir was carried out by Messrs. W. and J. Foster, of Hingley, at a cost of about 160*l.* per million gallons. The works were designed and carried out by Mr. Charles R. Fenwick, of Leeds, Mr. F. W. Sutcliffe having charge as resident engineer. For the domestic supply of West Hartlepool the bore-holes at Dyke House quarry, which are carried down into the limestone rock, give a supply sufficient not only for present requirements, but for those of a considerably increased population. By deepening the brick culverts running alongside the bore-holes and into which the water is discharged, additional storage is provided for a quarter of a million gallons. The work could only be carried out slowly, much of it having to be done under water. The contractors were Messrs Sudron and Laycock. The new pumping engine, working at twenty-seven revolutions per minute, is capable of

delivering into the storage tanks 200,000 gallons per hour, but the speed can be increased when requisite. The contractors for the whole of this apparatus were Messrs. Worth, Mackenzie and Co., of Stockton, all the work connected with the building and foundations having been carried out by Mr. H. S. Sudron, contractor, Hartlepool. The West Hartlepool extensions were designed and carried out by the company's engineer, Mr. Thomas Bowser.

FOREIGN.

FRANCE.—The Department of "Assistance Publique" has commissioned M. Roty, the celebrated artist in medal engraving, to produce a medal with on one face an allegorical group representing "La Bienfaisance confiant l'Humanité à l'Assistance Publique"; the other face to show a cartouche intended for the name and titles of the recipient of the medal.—M. Weerts, the painter, has been commissioned by the State to decorate the grand staircase of the Ecole des Ponts et Chaussées, in the Rue Saints-Pères. The scheme of decoration will include three vertical mural panels and a large ceiling panel, with allegorical figures symbolising Electricity, Navigation, Bridges, and Railways.—A new building is to be erected at Toulon for the Institute of Health there, at an estimated cost of 123,000 francs.—M. Sonnet, architect, of the town of Condé-sur-Noireau, has been commissioned to build a group of schools there, at an estimated cost of 118,000 francs.—A new *Mairie* is to be built at Saint-Just (Marne). M. Clement is the architect.—M. Gérard, architect, of Bordeaux, has been elected President, for 1904-1905, of the "Société des Architectes de Bordeaux et du Sud-Ouest." The Prefecture at Quimper (Finistère) is to be rebuilt from the designs of M. Vally.—The fine Hôtel de Ville at Tours, built from the designs of M. Laloux, was formally opened on Sunday last.—M. Homolle has sent a communication to the Académie des Inscriptions to the effect that he has discovered at Delos a splendid mosaic representing Dionysos armed with a thyrsus, and riding on a tiger. The work is judged to be of the date of about 300 B.C.

GERMANY.—The new Protestant church which was consecrated on the 31st ult. at Speyer has been erected by contributions from Protestants throughout the world in memory of the protest entered by the minority of the ancient German Diet on April 19, 1523, against the repressive policy of Charles V. which had been ratified by the majority of the Reichstag. The edifice is Gothic in style, and has been built after the designs of the architects, Flügge and Nordmann, of Essen. It has a length of nearly 79 yds., while the transepts are 45.85 yds. in breadth. The interior height of the central cupola is over 78 ft., while the tower which surmounts the porch has a height of over 327 ft. The whole edifice is constructed of grey sandstone, and in the porch already mentioned is a statue of Luther trampling, Bible in hand, upon the Papal bull. In the choir are stained-glass windows, the gift of the present Emperor.—The first premium for plans for new schools at Vegesack, near Bremen, has been awarded to Herr Lang, of Geestemünde.—A number of artists in Dresden have formed a Society of Artists for the Erection of Monuments, the aim of which is to enable the architect and sculptor to work together, each performing his portion of the work in such a manner that the unity of the whole design is preserved.—The Protestant Church at Speyer, which has been in course of construction since 1890, was consecrated on August 30; the church was designed by MM. Flügge and Nordmann.—The first Great Rhine-land Art Exhibition will be opened at Cologne on June 1, 1905.—A new synagogue is in course of construction at Berlin, from the designs of MM. Hoeniger and Sedelmeyer.—The Lutheran Church at Krefeld, designed by Professor Arnold in Romanesque style, is completed.—A new hospital is to be built at Munich, from the plans of Herr Schallner.

SWITZERLAND.—The ancient church of St. Martin, at Sempach, is being restored; the central aisle and the tower date from the Romanesque period, whilst the choir and other portions date from the XVIII century. On examination of the walls three different layers were discovered, each covered with paintings in the manner of its time.—The Town Hall at Bern, which has been rebuilt by Herr Wacker, was declared open on June 25.—The church at Rorschach, designed by Professor Müller, of Zurich, was consecrated on June 5.

THE TRANSVAAL.—The prevailing depression does not seem to affect materially the progress of building operations in and around Johannesburg. During the second quarter of

this year the Municipal Council passed for buildings to the approximate value 418,275*l.* The actual number of plans approved was 583, and represented 1,489 building alterations, and additions, with accommodation for 4,943 persons. To detail the items, there were 403 dwellings, 314 additions and alterations to dwellings, 563 rooms, 132 sheds, 100 stables, 106 shops, Johannesburg municipal, of course, takes the lead in building operations; but active work is also proceeding in the Vrededorp, Doornfontein, Bell-jeppes, and Turfontein districts. For fortnight ended July 25, 107 plans were proved. It is estimated that the building provided for under these plans will accommodate 575 persons, and the estimated cost, 86,000*l.*—*African Review.*

SYDNEY.—The design and tender of M. J. Stewart and Co. has been accepted for a new bridge over Sydney Harbour. It will be of the cantilever type, the main span 1,350 ft., the northern shore arm of the cantilever 530 ft. long, and the southern shore 500 ft. long. A trial cylinder has been taken to a depth of 90 ft. at the site of the northern pier to test the strata below the harbour, with the result that it has been decided to take the foundation down to the rock, and is proposed to form an island by filling a short distance above high-water mark, then to freeze the whole of the material lying the rock, so as to form a solid water-tight cylinder from the surface to the rock.

TRANSVAAL.—The new port of Famaagust approaching completion. The work has been carried out by Messrs. Wills and Co., of London, under the direction of Mr. H. resident engineer. In connexion with the port a small rail (or rather tram) way is being constructed through the length of the island, chiefly for the grain trade; but also hoped that the two improvements of island and tram may open the country to the world. Its natural beauties and archaeological treasures have only to be a little better known and tourists would flock to the shores of this enchanting island. The original estimate for Famaagust Harbour, made by Messrs. C. and Mathews in 1899, was 124,000*l.*; the way was estimated at 130,000*l.*; but it is understood the works are being carried out on a very much smaller scale.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. W. J. Laper, architect, has removed from 1, Raymond-buildings, Gray's Inn, to 1, Melina-place, St. John's Wood, N.W. Messrs. Benham and Sons are removing their showrooms from Nos. 50 and 52 to No. Wigmore-street, W.

THE ST. LOUIS EXHIBITION.—From the 25th inst. there is to be an International Congress of Arts and Science held at the St. Louis Exhibition. The organisers of the Congress desire to invite special attention to the opportunity which it offers their affects to meet and hear a great number of eminent men of learning. It is expected more than three hundred eminent scholars from Europe and America will deliver discourses on the various departments and sections of Congress, and that many hundred scientific communications will be made by those present.

THE RUSKIN MUSEUM, SHEFFIELD.—The annual report of the Ruskin Museum Committee states that the museum was open 615 days during the official year, and the total number of visitors was 47,357, as against 58,325 the year before, a decrease of 10%. This large difference is attributed to abnormal attendance during the holidays and Coronation festivities of 1902. During the past year the special exhibition took the form of a series of examples illustrative of the work of the old Italian masters, copied by artists who had worked under Ruskin. The examples proved a great attraction, and were thoroughly appreciated by many students and visitors throughout the year. A Supplementary Catalogue with descriptive notes was issued, two illustrated lectures were given by the curator on the collections. The museum was open during the winter months in connexion with the Free Public Lecture Scheme inaugurated two years ago. The lectures given by the curator last season were "Two lectures on the old Italian masters—'Florentine Painters' and 'Venetian Painters'—and three lectures on the art practice of John Ruskin—'Early Drawing—'Drawings for Illustration,' and 'Illustrations.' The lectures were illustrated by specially prepared lantern slides of the paintings and drawings, and five hundred tickets for the series were issued during the season, the lecture room being well filled on each occasion. An additional cast of the slides taken under Professor Ruskin's supervision

orative work of the Acanthus Arch of St. Mark's Cathedral, Venice, has been placed in a suitable case and placed in the gallery. During the year the buildings have been thoroughly overhauled and are now in a state of good repair. In addition to the collections, the following are of special note:—The volumes to date of the Library Edition of the works presented by Mr. George the literary executors under the late Professor Ruskin; a beautiful precious opal in the matrix and a set of Ruskin plates by Mr. George; reproductions of prints in the British Museum sent by the trustees; and the Medal in bronze, presented by Mr. Dyson, of Sheffield.

RAILWAYS AND LIGHT RAILWAYS.—We have the official circular for August of the Light Railways Association. It contains a copy of an interim report on machinery by the Engineering Committee, and also a series of answers to which will be of value to the Association. Their offices are at Clun Street, Surrey-street, Strand.

IMPROVED FELT.—Judging by samples sent by the manufacturers, the Patent Cloth Company, of Leeds, we believe intensive use will be made of the new felt now being introduced and manufactured in this country under the name of "watered felt." This is a cheap form of felt subjected to hydraulic pressure, the surface being impregnated with chemical solution intended to prevent the penetration of water and grease from above, and the surface of the felt with oil for the purpose of preventing the entrance of moisture from below. As we are not acquainted with the details of the chemical and special oil employed in the preparation of the felt, it is difficult to pronounce any opinion as to its efficiency, but the physical properties of the material itself appear to be satisfactory. In this connexion we may mention the mean results of some tests conducted by Messrs. Kirkaldy on three specimens of the felt. The original thickness was $\frac{1}{16}$ in., which was reduced, under a graduated compressive load, to $\frac{1}{32}$ in. on a load of 2,000 lb. per sq. ft., but on the removal of the load the thickness was found to be $\frac{1}{16}$ in., thus giving evidence of considerable elasticity. The felt is produced in a variety of degrees of hardness, and in different thicknesses, to suit various requirements. It is used in the construction of tramway rails, for minimising vibrations and partitions, and upon floors, for preventing the conduction of sound and heat, and for preventing the percolation of water, and is used in the construction of fireproof rooms and chambers for various purposes. It would be too much to say that any material impregnated with oil as fire-resisting properties, the absence of which militates somewhat against the adoption of this felt in building; but, even with this limitation, it is many purposes for which it may be profitably employed.

ANNUAL EXPLORATION FUND.—The annual meeting of the subscribers to the Caerwent Exploration Fund was held on the 1st inst., Mr. Martin, the reorganising president. Mr. Martin, the reorganising president, had been re-elected, and there was now only sufficient money to defray the expenses of the week's work. Mr. Swash stated that the report of the Corporation had again promised a contribution of 25l., and Mr. Ashby read a statement that the British Association had granted a special grant of 15l. to be expended on the exploration of the mound and of the objects of investigating, by an examination of the earth taken from the plant life of the Roman-British Museum, and works were afterwards inspected. Mr. Ashby, describing the found inscribed stone, the large houses are now being explored, and the very fine south gate, the complete excavation is prevented by the presence of the following special grants have been granted:—The Society of Antiquaries, 25l.; and Gloucester Archaeological Association, 50l.; Bath Club, 50l.; Iffon Antiquarian Club, 50l.; Monmouth and Caerleon Antiquarian Association, 25l.; Rhondda Antiquarians' Association, 50l.; Woolhope Club, 25l.; and the Cardiff Naturalists' Club, 15l.

GRANITE TIMBER FOR THE UNITED STATES.—Mr. W. Wardrop, writing from St. Petersburg, July last, states that the United States is Russia's best customer for timber, and supplies about one-quarter of the amount imported into the United Kingdom. The annual value of the trade is 1,000,000l. The export from Cronstadt

and St. Petersburg in 1903 was well above the average for the last ten years, and was only exceeded in 1901; more than three-fifths of it went to Hull, London, Leith, Crangemouth, and West Hartlepool; prices were, on the whole, higher than they had been for some years. From Finland the export of sawn wood is almost the same as in 1902, but there has been an enormous increase in logs and pit-props, the quantity of which has doubled. The Finnish Senate has authorised the exploitation of the forests in the extreme north of Lapland in an area of 2,500,000 hectares (about 6,200,000 acres), and it is proposed to begin by cutting down 8,000,000 to 10,000,000 trees.

NORWEGIAN STONE EXPORTS.—The export of granite from Norway was somewhat larger in 1903 than in previous years, but the prices were low. The export of hewn stone from Christiania is only an insignificant portion of the country's total export. The principal centre of the stone trade is in the southern part of Smaalen; in these quarries, however, Christiania capital is closely concerned. The value of the country's total export of granite in 1903 is estimated at something exceeding 165,270l., against 137,725l. in 1902. Of this sum the United Kingdom is the largest contributor, whilst Germany takes less each year, owing to Swedish competition. The three principal exporting places for hewn stone are, in order, Fredrikstad, Fredrikshald, and Sarpsborg.

DANTZIG TIMBER TRADE.—The timber trade of Dantzic, Mr. Consul Brookfield reports, has not yet quite recovered from the general depression of 1901, and shippers still complain of unremunerative prices. Owing to a deficiency of water in the Vistula, supplies from Russia reached Dantzic later than usual, and thus prevented some shippers from delivering their orders at the stipulated time. In August, too, the British demand for Dantzic wood began to slacken, and stocks accumulated accordingly. On the whole, however, there was plenty of activity in the timber trade. The supply in 1901 was 315,450 loads, valued at 661,355l.; in 1902 it was 191,450 loads, valued at 443,630l.; and in 1903, 308,450 loads, valued at 730,720l. In another part of his report Mr. Brookfield explains that the kind of wood most in demand for the British market was oak for railway sleepers.

ARTESIAN WELLS IN ALGERIA.—The sinking of artesian wells in Algeria goes on quietly, but continuously, in the south, and the efficacy of the work is said to be gradually changing the face of the country. Where nothing grew twenty years ago are now flourishing oases, planted with date palms, bringing riches to a people who formerly lived on what they could. An account recently published by the Algerian Government contains the following information:—The total depth bored in the province of Constantine from June 1, 1855, to June 1, 1902, represents 38,702 metres (126,943 ft.), divided as follows—360 trials of a total depth of 27,919 metres gave 435 beds of ascending water and 568 beds of gushing water, delivering together 352,000 cubic metres (840,782,000 gallons) of water per twenty-four hours; 257 trials for drinking water, representing a depth of 4,904 metres, gave 133 beds of ascending water, drinkable, and twelve beds of gushing water, the total delivery per twenty-four hours being 1,200 cubic metres (4,622,100 gallons); 177 trials for ordinary wells and forty trials of the strata for the foundations of bridges gave together 229 beds of very drinkable ascending water and three beds brackish. The very successful results obtained in Algeria in places where nothing on the surface denoted the existence of underground water may, it is suggested, be useful to countries where water is not visible on the surface. The bed of water has been struck at very different depths—from 79 to 150 metres. The subterranean water contains fishes, which have been thrown up through the boring tubes—they are quite blind. Fossils of all sorts have also been thrown up.

INSANITARY HOUSES IN HULL.—According to the report of the Medical Officer of Health, twenty-nine slum dwellings were demolished in Hull last year. Systematic inspection resulted in eighty dwelling-houses being reported upon as unfit for habitation and their owners being served with statutory notices. Only about twenty of these were repaired. Of the remainder, twenty-nine have been demolished and the sites cleared, and thirty-one converted into warehouses. Only in four cases, however, were legal proceedings instituted for the compulsory closure of the property.

PAN-CELTIC CONGRESS.—On the 31st ult. Sir William Prece presided at the afternoon section meeting of this Congress, which was devoted to papers and discussions on Celtic costumes, customs, and folk-lore. In the course of his presidential address, on "Egyptian and Celtic Lore and Worship,"

Sir William Prece said that there was a remarkable connexion between the religions, language, customs, and rites of the Ancient Egyptian and those of the Ancient Briton. Tacitus mentioned the mysteries of Germany as being similar to those of Egypt and Britain. Professor Rhys had shown, in his "Celtic Britain," that the Druids were so like Egyptian magicians that an old Irish writer called James and James Egyptian Druids. Not much was known of Druidism, for the early Celts had no written literature, for they adopted a literature they used the Roman script. The Ogam inscriptions were comparatively modern. Cæsar, Diodorus, Strabo, Tacitus, and Pliny wrote much about the Druids, who were the priests, judges, doctors, teachers, philosophers, scientists, and magicians of the Celts. They knew astronomy. They worshipped the Supreme Being, and they made the oak His symbol. Their only temple was an oak grove, an oak tree being their holy of holies. It was regarded not only as the emblem, but as the temporary residence of God, as Moses regarded the tabernacle in the wilderness. This was essentially an Egyptian idea. Every Egyptian temple had an inner sanctuary, the holy of holies, where the Deity was supposed to reside. The Druids taught an eternal life, and, like the Egyptians, believed in the resurrection for which they prepared. Professor Rhys had pointed out that the Celtic language was full of a pre-Aryan influence, and Professor Morris Jones had dealt ably with the pre-Aryan syntax in insular Celtic. The aborigines of Wales were probably savages, but they were ousted by the Iberians, who came there through Gaul and Spain from North Africa. The Celts and the Berbers were their survivors to-day in and near Egypt. Ethnology proved this by the shape of the skull, and philology confirmed it by the similarity of language. Ancient Egyptian agreed very closely with this pre-Celtic dialect, not only in the order of words in a sentence, the peculiar personal suffixes, the periphrastic conjugation of pronouns and propositions, the mode of word building, but in the remarkable use of letters and single syllables which had no equivalent in English and an apparent system of mutation. In many cases the coincidence was absolute. The verb in these languages came before the subject. This was not the case in any Aryan tongue. It is impossible to ignore this remarkable connexion or to resist the conclusion that Welsh and Ancient Egyptian were closely allied. The Eastern influence was seen in the formation of personal names. There was more that was Semitic in that practice than Aryan. The Aryan practice, as seen in Greek and Latin and continued in modern Europe, was quite different. Professor Rhys had said, "No evidence could well be more conclusive as to the former presence in these islands of a population of natives of non-Aryan origin." One more link—the Aryan race had been everywhere patriarchal, but the Berber and pre-Aryan race in Britain were matrilineal. The Pharaonic system of marrying one's sister led him to think that the matrilineal system existed in Egypt. When the king died in Berber or was deposed—a common occurrence—it was not his son who succeeded him, but the son of his sister. Again, the dress of the Druid and Egyptian priests were somewhat similar. Both rituals had mystic dances and arks or boats in their religious processions. The Druidical ark was a symbol of the Deluge and was undoubtedly Aryan in its origin. Like the Egyptians, who worshipped the bull, the Druids had Hu, the Royal bull, and Beuno, the ox of the ship, and both the Ancient Britons and the Egyptians worshipped the eagle and the wolf, rites which had, according to Davies, passed from Egypt, through Phrygia and Greece, into Etruria and Celtia.—*Times*.

THE SIMPLON TUNNEL.—Mr. Towsey, British Consul at Milan, in a communication to the Foreign Office, published on Monday last, observes:—"Reports from Domodossola state that 19,304 metres of the Simplon Tunnel had been pierced by August 1, that the daily progress made throughout the month of July was 670 metres, and that the total pierced in that month was 209 metres. On August 1, 426 metres had still to be pierced, but this had been reduced to 377 metres by August 7. Work has been suspended on the north side since last May, and has had to be carried on from the south side. It is now expected that the tunnel will be completely pierced by the middle of October, 1904, but naturally it cannot be opened to traffic before next year. The exhibition which was to have been held at Milan in 1905 to celebrate the opening of this tunnel has been postponed to 1906. Another international section has been added to those previously announced. It is described as a 'working hall for industrial arts,' and divided into the following categories:—(1)

Graphic arts and the manufacture of artistic and decorative paper; (2) artistic manufacture of metals and wood; (3) ceramic, pottery, glass; (4) textile industries and allied manufactures; (5) wallpapers, tapestry, worked and decorative leather, wall hangings, etc.; (6) industrial arts generally."

PRESERVATION OF TINTERN ABBEY.—The preservation of the east window of Tintern Abbey, which is part of a scheme for the general overhauling of the whole ruin, is now being carried out. Examination of the central shaft has shown that the stone has been so much affected by the weather that if it is taken down it is doubtful if it can be put up again. What shall be done is still under consideration, one project being to strengthen it by the addition of narrow steel bands placed close to the stonework. The other work of preservation takes the form of pointing the ashlar in many places and filling in the gaps between the masonry on the exposed summits of the walls either with cement or lead, for this will prevent the percolation of the rain. Above the east and west windows at the extremities of the nave are gables, pierced with smaller Gothic windows. These also are all being pointed, and any loose pieces of masonry will be fixed. The mullions and tracery of some of the windows to the south of the nave have been already strengthened. The work is being carried out after consultation with Mr. Waller, architect, of Gloucester.

Legal.

THE WEST-END ANCIENT LIGHT CASE.

In the Vacation Court on Wednesday the case of Milton v. Maskelyne was again in the list for hearing before Mr. Justice Bigham.

On the case being called on, counsel stated that the parties were gradually coming to an agreement, and they desired that it should stand over for one week.

His Lordship acceded to the application, remarking that it was time that the case vanished from the list.

ANCIENT LIGHT DISPUTE AT HADLEY.

The case of Scrivener and others v. Ager came before Mr. Justice Bigham in the Vacation Court on Wednesday on an application by the plaintiffs, the freeholders and occupier of No. 184, High-street, Hadley, near Barnet, for an interim injunction restraining the defendant until the trial from building on the site of No. 182, High-street, Hadley, so as to obstruct the light coming to an ancient window in the plaintiffs' premises.

In the result His Lordship directed that the motion should stand over until the trial, the costs being reserved.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

28,232 of 1903.—W. SHREVELL: *An Outward Opening Casement.*

An outward opening side-hung casement provided with extended or outwardly projecting joints or hangings, which, when open, create a space or opening between casement and frame, through which the outer side is easily accessible from within.

19,102 of 1903.—C. VON PECHY: *Locks or Fastenings for Doors.*

A lock or fastening for doors adapted to be opened or closed from a distance, comprising, in combination with the usual lock case and staple plate, a latch guided by a roller projecting through a horizontal slot of the latch, an angle lever pivoted in the lock case, a horizontal stud projecting from the end of the vertical arm of the lever and engaging with a vertical slot of the latch, a weight at the end of the other arm of the angle lever, a cord attached to the same end of said lever guided over rollers to the place from which the door is to be opened, a knee-joint arm projecting from the inner surface of the weighted arm of the angle lever, a casing in the lock case above the latch, a spoon-shaped bucket, pivoted in said casing, a loose ball in said bucket, an opening in the front wall of said casing, an arm of the knee-joint projection of the angle lever reaching behind the bucket and a blade spring above the casing to press on the angle lever when it is lifted.

19,559 of 1903.—A. P. TOWL: *An Adjustable Bracket for Shelves or other purposes.*

An adjustable bracket for supporting a weight, consisting of a socket or sleeve portion adapted to embrace the whole or a part of the section

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

of a standard, and slide thereon, and an outwardly-extending pivoted arm, which latter, at a point below the pivot, short of the elbow, is adapted to press on the surface of the standard through the medium of an interposed roller, block, ball, or other distance piece, and cause sufficient friction to prevent the downward movement of the bracket.

19,564 of 1903.—W. H. HOYLE and T. BARKER: *Hydraulic Appliances for Opening and Closing Gates and other Movable Structures which are acted upon by Hydraulic Rams or Pistons.*

The object of this invention is to dispense with the usual levers, connecting rods, and valves, and to substitute therefor a four-way valve with suitable inlets and outlets. In carrying this invention into effect a plug tap or valve is used with four portways, the said portways being formed in the plug at equal quarters of a circle in the periphery of the plug; the first portway leads to the second portway by a curved passage formed in the inner part of the plug or valve, thus forming a passage from the first to the second portway. A similar passage is also formed from the third portway to the fourth portway. The valve casing or valve body is formed with four ports, corresponding with the four ports in the plug.

20,438 of 1903.—E. R. FAWCETT: *Appliances for the Prevention of Hoist Accidents.*

This consists in the combination of two flaps or doors, one hinged or pivoted, to the hoist floor, and the other hinged or pivoted to the floor of the room, and placed in juxtaposition to each other.

20,504 of 1903.—W. C. HODGSON: *A Lifting Apparatus.*

A portable lifting apparatus, consisting of a wheeled frame supporting a pair of vertically-disposed tubes, one situated within the other, the inner of said tubes being adapted to be raised and lowered and maintained at any desired position, and having pivotally connected at its upper end a lifting arm, pole, or lever, provided with a hook or the like at one end, and a handle (with or without a balance weight) at the other, said lifting arm or the like having a series of holes formed therein for the object of adjustment.

20,517 of 1903.—C. McCALLUM and J. McGRUTHER: *Fixing of Pulleys, Electric Wires, and such like to Ceilings.*

Fixing electric wires, pulleys, and such like to ceilings, consisting in an attachment composed of an inverted dome or cup-shaped piece of metal formed with pointers and counter-sunk holes for fixing it to a ceiling, and having lateral or circumferential holes or apertures and a central hole for the insertion of the electric conductors for suspending an electrolier or lamp, or adapted for a pulley screw or screws in use with laundry bolts.

20,852 of 1903.—J. SOSS: *Hinges.*

A hinge comprising three parts, one of which consists of a plate having a longitudinal opening in one edge thereof and an oblong member arranged transversely therein and connected at the ends thereof with said plate, and a convex in cross section on one side and plane on the other, the convex side of said member being provided at the opposite ends thereof with segmental shoulders or projections having segmental grooves in the opposite faces thereof, and said member being also provided adjacent to one edge thereof, and on the convex side thereof with lugs or projections; another part consisting of a plate provided with a longitudinal opening in one edge thereof, and with an oblong member secured therein, and said member being segmental in cross section and provided at its opposite ends and on its concave side with segmental shoulders or projections, in the opposite face of which are formed segmental grooves, said member being also provided on its concave side and near the edge thereof with lugs or projections; the other member consisting of an oblong plate segmental in cross section and thickness at both ends and provided in each end with a segmental groove, said parts being connected and adapted to turn one upon another.

21,533 of 1903.—W. PEMBERTON and J. DYSON: *Boilers for Hot Water Heating Apparatus.*

This consists in the combination with a boiler for hot water heating apparatus of a vessel containing water heated by a flue from the boiler furnace connected to an internal flue or tube, passing to and fro in the water vessel and from thence to the chimney or smoke outlet.

21,540 of 1903.—J. JACKSON: *Lifts or Elevators.*

A lift or elevator, consisting in the combination of a collapsible or folding gate, a locking and releasing device by which the starting and stopping rope is locked and released, or

an electrical switch operating part is locked and released, said locking or releasing being connected with and operated by the vertically moving parts of the gate back or fixed portion thereof.

21,692 of 1903.—J. N. RUSSELL: *Hot Water Circulation Apparatus.*

A hot water circulation apparatus, consisting in introducing air or other equivalent gas fluid under pressure into the water in ascension pipe leading to the top tank, for purpose of accelerating the upward flow of water in said pipe.

22,450 of 1903.—TONKS, LTD., and W. SPA: *Casement Stays.*

A casement stay, the said casement stay assisting essentially of a slotted plate or hinged casement frame, the upper part of slot of which plate has in it a series of or recesses for a fastening gravity bolt or on a pin on the pivot stay or casement, to engage with and thereby lock or fasten the arm where the locking or fastening bolt knob is actuated by gravity alone or gravity supplemented by the pressure spring.

25,751 of 1903.—J. W. RICE: *A Portable Platform.*

This invention relates to a portable platform for the use of painters and others, and carried into effect in the following manner. A board is provided having about one-third of its length of greater width than the two-thirds, the wider part forming the platform. In the narrower part two slots provided in which run two balls connected above the board by a strap and below board by a cross-bar having two downward-pointing rods, wing or fly nuts being provided on the balls to enable them to be retained in any part of the slots. Below the front end of the actual platform is hinged one end of a three-sided strut, in such a manner that the inner end of the strut will be considerably below the inner end of the platform when the strut is opened, by straightening tie-bars having a rule joint in the centre of their length, having one end hinged to the strut and the other to the actual platform.

10,575 of 1904.—C. R. WILBERT: *A Valve Wash-hand Basins.*

A device comprising a basin provided with a discharge port, having vertically arranged recesses and a shoulder, a bushing provided with a flange adapted to rest upon the shoulder to support the bushing and to form a valve seat, vertically arranged ribs or bushing to engage the recesses to prevent bushing from turning, a frame extending across the bushing at a point adjacent lower end and adapted to prevent the passage of foreign matter through the bushing, screw-threaded stem centrally and vertically arranged upon the frame, a disc-shaped adapted to engage the flange to close discharge port, a sleeve depending from underside of the valve and adapted to ride on the stem, and a lever conforming to the contour of the interior of the basin and seat to the valve.

11,995 of 1904.—A. ZAEN: *Adjustable Combined School Desks and Forms.*

An adjustable form comprising, in combination with the usual uprights, a desk, a shelf, a seat, and a connecting beam, one end of which is fixed in the frame of upright, the other end being adjustably guided in a guide piece fixed on the lower end of the seat, a screw-bolt downwardly projecting from the seat through a longitudinal opening of the connecting beam, and a thumb-nut the lower end of the screw-bolt for securing the beam in its position with regard to seat.

14,011 of 1904.—C. McCALLUM and STEWART: *Portable Attachment of "Wrenches" and like Appliances to Bathing the like.*

This relates to the attachment of "wrenches" and the like to baths and the like, consisting of a metal bracket mounted on a wall above the bath by which a piece of wood supported and clamped rigidly in position for the accommodation and support of "wrencher," in combination with a semi-circular piece of metal for attaching the end of wood to the bath at its opposite end.

14,375 of 1904.—D. F. HENRY, JUNIOR: *Devices for Tile and like Mosaic Machines.*

This consists in the combination of a rotating mechanism, a palette or tray, and adapted to support the tile to be turned, a movable palette receiving and having position normally in the path of the rotating mechanism, means for retracting support, and means for returning the palette receiving position.

471 of 1904.—H. S. HALP: Combination of Bath, Lavatory Basin, Flushing Cistern, and Water Closet.

is consists in the combination with a basin a fixed flushing tank below said basin, and to which the same is adapted to discharge, water closet below and connected with said tank, a common supply pipe and connexions between the same said basin and tank, and a valve in the connexion between said pipe and tank.

650 of 1904.—P. RUSCHWEYH: Chimney-tops and the like.

chimney-top characterised by the upper wall being constituted by two parts, between which are arranged the weathercock and the arching rod guide, and which are connected by screws, the lower cowl being secured to said upper cowl, on the one hand, by means of lateral screws, and, on the other hand, by means of a retaining piece mounted on the upper cowl and having a wide head, in which the suction cone is constituted of several separate plates, the bent flanges of which as wind guide surfaces are detachably joined together, the plates or the lower extension of the chimney-top being detachably joined to the suction cone plates by means of screws, for the purpose of enabling the chimney-top to be easily taken to pieces and erected.

102 of 1904.—W. R. LESTER: Glazing Bars or Astragals for Roof Lights and Windows.

glazing bar or astragal, consisting of a central core of inverted T-form, and having vertical and a more or less horizontal member, steps upon the horizontal member, and a sheath enclosing the core, and having its projecting upwards from the edges of the sheath, and from the edges of the horizontal member.

650 of 1903.—J. PERRY: Construction of Wells and Cesspools.

his invention consists in lining the walls of wells for spring water and dumb wells or cesspools with earthenware pipes impervious to water, in place of brickwork, which, as is well known, permits surface water and drainings to percolate into the well.

568 of 1903.—J. G. CONDE (A. FERNANDEZ): Framework and Ventilating Devices for Tunnels, Shafts, Mines, or the like.

arrangement for lining the walls of tunnels, shafts, mines, and the like, comprising a series of frames connected together at intervals apart by longitudinal braces and braced plates, the latter preferably arched somewhat, in combination or not as desired with a cross girder or brace near the top of the frame for bracing the two side pieces together, and a legging for separating the side pieces from the space below the brace, so that the space above acts as a longitudinal ventilating shaft.

694 of 1903.—J. W. BROWN: A Flood Gully and Weir Chamber Combined.

his relates to means for carrying off storm water and preventing flooding, consisting of a usual or suitable gully furnished with a weir chamber, in combination with a weir, into which the water and obstruction are thrown by a grate surface suitably inclined towards the kerb.

181 of 1904.—P. STEENOCK: Manufacture of a Material Designed for the Production of Cement.

process of manufacturing a material designed for the production of cement, consisting in mixing beryllium compounds, difficultly soluble in water, and reacting with or decomposable by phosphoric acids or their acid salts, with like compounds of light metals, including zinc.

SOME RECENT SALES OF PROPERTY:

Table listing real estate sales with columns for location, date, and price. Includes entries for Worcester, Sussex, Gloucester, London, and various other locations.

Table listing property sales: De Beauvoir Town, Hoxton, 224 yrs, Oving, Sussex. Includes details like '22 yrs, gr. 7l. 10s., yr. 77l.' and prices like '£555'.

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.r. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; crs. for crescent; av. for avenue; gds. for gardens; yd. for yard; g.r. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

MONDAY, SEPTEMBER 12. Institute of Sanitary Engineers.—Meeting of Organising Committee, 3 p.m. Examination and Literary Committee, 5 p.m.

SATURDAY, SEPTEMBER 17. Institute of Sanitary Engineers.—Visit to the Reading Waterworks.

Architectural Association.—Week-end visit to Kettering and district.

Northern Architectural Association.—Visit to South Shields.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

** Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table titled 'BRICKS, &c.' listing various types of bricks and their prices per 1000. Includes 'Hard Stocks', 'Rough Stocks', 'Gizzles', 'Facing Stocks', 'Shippers', 'Flatness', 'Bed Wire Cuts', 'Best Paveham Red', 'Best Red Pressed', 'Hunton Facing', 'Best Blue Pressed', 'Staffordshire', 'Do. Balmose', 'Best Stourbridge', 'Fire Bricks'.

Table titled 'GLAZED BRICKS, Best White and Ivory Glazed' listing various types of glazed bricks and their prices. Includes 'Stretchers', 'Headers', 'Quoins, Bullnose', 'Do. Flatness', 'One Side and two Ends', 'Two Sides and one End', 'Splays, Chamfered, Squints', 'Best Dipped Salt Glazed Stretchers and Headers', 'Quoins, Bullnose, and Flats', 'Double Stretchers', 'Double Headers', 'One Side and two Ends', 'Two Sides and one End', 'Splays, Chamfered, Squints', 'Second Quality White and Dipped Salt Glazed'.

Table titled 'BRICKS, &c.—(continued)' listing various types of bricks and their prices. Includes 'Thames and Pit Sand', 'Thames Ballast', 'Best Portland Cement', 'Best Ground Blue Lias Lime'.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered. Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dep.

STONE.

Table listing stone products: Bath Stone, Ancaster in blocks, Greenshill, Darley Dale in blocks, Red Corseshill, Clachburned Freestones, Red Mansfield, York Stone—Robin Hood Quality.

Table listing various stone products and their prices per cubic foot or per ton. Includes 'Scrapped random blocks', '6 in. sawn two sides landings to sizes (under 40 ft. super.)', '6 in. rubbed two sides ditto, ditto', '3 in. sawn two sides slabs (random sizes)', '2 in. to 2 1/2 in. sawn one side slabs (random sizes)', '1 1/2 in. to 2 in. ditto, ditto'.

HARD YORK—

Table listing 'Hard York' stone products: 'Scrapped random blocks', '6 in. sawn two sides, landings to sizes (under 40 ft. super.)', '6 in. rubbed two sides ditto', '3 in. sawn two sides (slabs random sizes)', '2 in. self-faced random flags', 'Hopton Wood (Hard Bed) in blocks'.

SLATES.

Table listing various types of slates and their prices. Includes '20 x 10 best blue Bangor', '20 x 12', '20 x 10 first quality', '20 x 12', '18 x 8', '20 x 10 best blue Port.', '18 x 8 madoc', '20 x 10 best', '20 x 12', '18 x 10', '18 x 8'.

TILES.

Table listing various types of tiles and their prices. Includes 'Best plain red roofing tiles', 'Hip and Valley tiles', 'Do. Ornamental tiles', 'Hip and Valley tiles', 'Best Runbou red, brown, or brimled do. (Edwards)', 'Do. Ornamental do.', 'Valley tiles', 'Best Red or Matted Stafford shire do. (Penkes)', 'Do. Ornamental do.', 'Hip tiles', 'Valley tiles', 'Best "Rosemary" brand plain tiles', 'Best Ornamental tiles', 'Hip tiles', 'Valley tiles', 'Best "Hartshill" brand plain tiles, sand faced', 'Do. pressed', 'Do. Ornamental do.', 'Hip tiles', 'Valley tiles'.

WOOD.

Table listing various types of wood and their prices. Includes 'Deals: best 3 in. by 11 in. and 4 in.', 'Deals: best 3 by 4', 'Battens: best 2 1/2 in. by 7 in. and 8 in.', 'Battens: best 2 1/2 by 6 and 3 by 6'.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Table with 4 columns: Nature of Work, By whom Required, Premiums, and Designs to be Delivered. Includes entries for Kingstown (Ireland) U.D.C., Benwell and Fenham U.D.C., Wallasey Education Committee, Uxbridge Guardians, and Wallasey U.D.C.

CONTRACTS.

Large table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tenders, and Tenders to be Delivered. Contains numerous entries for construction projects across various locations like Manchester, Warrington, and London, listing the responsible bodies and tendering procedures.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, Applications to be in. Lists various roles like Engineer, Draughtsman, Surveyor, etc.

Those marked with an asterisk (*) are advertised in this Number. Competitions, —. Contracts, iv. vi. viii. x. Public Appointments, xvi.

CURRENT.—Continued from page 281.

WOOD (continued). Table with 3 columns: Description, At per standard, £ s. d. Lists various wood types and their prices.

JOINERS' WOOD.

Table with 3 columns: Description, At per standard, £ s. d. Lists joiners' wood types and their prices.

SEASIDE AND PETERSBURG.

Table with 3 columns: Description, At per standard, £ s. d. Lists seaside and Petersburg wood types and their prices.

WINE-OAKS.

Table with 3 columns: Description, At per standard, £ s. d. Lists wine-oak types and their prices.

WALNUT, AMERICAN.

Table with 3 columns: Description, At per standard, £ s. d. Lists American walnut types and their prices.

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METALS.

Table with 3 columns: Description, Per ton, in London, £ s. d. Lists various metal types and their prices.

LEAD, &c.

Table with 3 columns: Description, Per ton, in London, £ s. d. Lists lead and other metal types and their prices.

COPPER.

Table with 3 columns: Description, Per ton, in London, £ s. d. Lists copper types and their prices.

BRASS.

Table with 3 columns: Description, Per ton, in London, £ s. d. Lists brass types and their prices.

SOLDER.

Table with 3 columns: Description, Per ton, in London, £ s. d. Lists solder types and their prices.

ENGLISH SHEET GLASS IN CRATES.

Table with 3 columns: Description, 2d. per ft. delivered. Lists English sheet glass types and their prices.

OILS, &c.

Table with 3 columns: Description, £ s. d. Lists various oil types and their prices.

VARNISHES, &c.

Table with 3 columns: Description, Per gallon, £ s. d. Lists various varnish types and their prices.

TERMS OF SUBSCRIPTION.

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TERMS OF SUBSCRIPTION.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays, [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100L, unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

BRENTWOOD.—For erecting workshops at High Wood School, for the Metropolitan Asylums Board.

Table with 3 columns: Name, Amount, £ s. d. Lists contractors for Brentwood workshops.

BRENTWOOD.—For wood fencing and iron railings at High Wood School, for the Metropolitan Asylums Board.

Table with 3 columns: Name, Amount, £ s. d. Lists contractors for Brentwood fencing and railings.

CELBRIDGE (Ireland).—For alterations and improvements at Rathcoole Dispensary residence, for the Guardians.

Table with 3 columns: Name, Amount, £ s. d. Lists contractors for Celbridge alterations.

CLAYTON-LE-MOORS.—For 240 lineal yards of wrought-iron unclimbable fencing, with gate complete fixed for the Urban District Council.

Table with 3 columns: Name, Amount, £ s. d. Lists contractors for Clayton-le-Moors fencing.

DARTFORD (Kent).—For alterations and additions at Darent Asylum, for the Metropolitan Asylums Board.

Table with 3 columns: Name, Amount, £ s. d. Lists contractors for Dartford alterations.

IPSWICH.—For the erection of house, shop, and works, St. Matthew's-street, Ipswich, for Mr. W. D. Coe.

Table with 3 columns: Name, Amount, £ s. d. Lists contractors for Ipswich house and works.

LANANELLY.—For alterations to Bridgend Inn, New Dock, Llanely, for Mr. John Williams.

Table with 3 columns: Name, Amount, £ s. d. Lists contractors for Lananelly alterations.

LLANELLY.—For re-building the Dynover Castle Hotel, Market-street, Llanelly. Mr. J. Billet, architect and surveyor, 16, Park-street, Llanelly:—
H. Thomas & Son, Botley-road:— £746 10
Exclusive of plumbing and painting.

LLANTARNAM (Wales).—For building a house, for the executors of the late H. Lawrence. Messrs. J. H. Penne & Co., architects, Skinner-street, Newport:—
J. Charles, Cridan, Newport £816

LONDON.—For painting, distemping, whitewashing, etc., the interior, and painting, etc., the exterior of the Guardians' Offices, 287, Toodle-street, for the Guardians of the Poor of the Parish of Bermondsey. Messrs. Newman & Newman, architects and surveyors, 31, Toodle-street, London Bridge, S.E.:—
P. McCarthy .. £1,155 0 0 J. Greenwood, .. £916 0
J. A. Renwick 1,134 0 0 Lid. 879 10
J. Richards .. 1,090 0 0 W. Reason .. 879 10
H. Kent .. 1,948 0 0 Spencer, Santo, & ..
J. Scott Penn .. 989 0 0 Co., Warlek- ..
Vigne & Co. 889 0 0 road, Kenning- ..
ton* \$10 0

LONDON.—For painting, distemping, whitewashing, etc., the interior, and painting, etc., the exterior of the infirmary, Lower-road, Rotherhithe, S.E., for the Guardians of the Poor of the Parish of Bermondsey. Messrs. Newman & Newman, architects and surveyors, 31, Toodle-street, London Bridge, S.E.:—
H. Kent .. £2,895 0 0 W. Reason, .. 47
J. A. Renwick .. 2,740 0 0 Rosbery-avenue, ..
Hall Bros. 2,477 0 0 E.C.* £2,292
J. Richards .. 2,450 0 0 Wontner & Co. 1,987

LONDON.—For painting and cleaning works, etc., South Wharf, Trinity-street, Rotherhithe, S.E. (River Ambulance Service), for the Metropolitan Asylums Board:—
W. C. Reeder .. Vigor & Co. £317 10 0
& Co. £161 15 0 J. Hall .. 306 6 0
W. J. Coleman .. W. Gray & Co. 276 7 11
& Co. 455 10 0 J. J. Richards, ..
A. Porter .. 374 0 0 S. M. Davids- ..
W. Durrant & .. 370 0 0 Borough, ..
J. Bullers .. 369 10 0 S.E.* 269 0 0
Wontner & Co., ..
Ltd. 337 0 0

MARGATE.—For laying water-mains in Monkton, Stenmouth, and Preston, for the Corporation. Mr. A. Latham, M.Inst.C.E., 15, Cecil-square, Margate:—
C. Carter & Co., Harlinge, Westgate-on-Sea, 176 18 9

MERTHYR VALE.—For erecting caretaker's house adjoining the Constitutional Club. Mr. W. Dourdsell, architect, Treharis:—
Jones Bros., Treharis £232 12 6

NESTON (Cheshire).—For the erection of an entrance lodge and chapel at Cemetery, Raby-road. Messrs. Knowles & Russell, architects. Quantities by architects:—
A. White .. R. T. Amery .. £1,513 9 6
Son. £1,877 0 0 J. Merritt .. 1,491 0 0
W. Pleasing .. 1,715 0 0 J. & E. Evans, ..
J. Taylor .. 1,700 0 0 S. o. l. o. n. ..
R. Allen .. 1,565 0 0 Cheshire* .. 1,479 0 0
P. McLachlan 1,532 0 0

POOLE.—For road and sewer works, Springfield-road and Woking-road, Parkstone. Mr. J. Elford, Borough Surveyor, Poole:—
Springfield-road Sever.
Tryhorn & Son, Salisbury* £523 11 0
Woking-road Drains.
Gates & Gulliver, Parkstone* 107 6 0

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OLD KILPATRICK (Scotland).—For additions to Gavinburn School, for the School Board. Messrs. Thomson, Turnbull, & Peacock, architects, 122, Wellington-street, Glasgow. Quantities by Messrs. G. Smellie, Taylor, & Browne, 189, St. Vincent-street, Glasgow:—
Mason Work: D. Winton, Duntocher, .. £1,200 0 0
Joiner Work: R. Vennial, Levenford- .. 598 11 7
terrace, Dunbarton ..
Slater Work: W. Latts & Son, Canal- .. 147 13 6
street, Clydebank ..
Plaster Work: J. & H. Williamson, .. 87 5 9
Bank-street, Clydebank ..
Plumber Work: R. Cameron, Bon- .. 165 0 0
accord-place, Clydebank ..

STROOD.—For erecting a greenhouse at Strood Cemetery, for the Joint Burial Committee for Strood Intra and Strood Extra. Mr. Amos B. Acworth, architect, 114, High-street, Strood:—
G. A. Waterton £200 0 0 Tanner Bros. ... £125 0 0
L. A. Leonard .. 198 0 0 R. Illuaa .. 124 10 0
West Bros. 175 0 0 Mitchell & Wor- ..
G. West .. 158 0 0 sell, Hallway* .. 98 0 0
J. S. Hiltch .. 156 10 0

SWINDON.—For erecting new offices, stables, etc., and alterations and additions to premises, Henri-street, for Swindon Co-operative Provident Society. Mr. R. J. Beswick, architect and surveyor, 10, Victoria-road, Swindon:—
S. Packman .. £1,295 0 0 W. Warren .. £1,100 0 0
Brook .. 1,228 0 0 T. y d e n a n ..
Norman .. 1,199 10 0 Bros. Swin- ..
A. J. Colborne 1,199 10 0 duu* 1,150 0 0
Leitchfield .. 1,188 0 0 S. Chambers 1,106 5 0
J. Williams .. 1,174 17 6

TOTLAND BAY (Isle of Wight).—For erecting a Bible Christian Chapel. Mr. S. E. Tomkins, architect and surveyor, Newport, Isle of Wight:—
J. Ball & Son, Cores, Isle of Wight* .. £2,220

WELWYN.—For the completion of a well, providing engine and gas-producer house, gas plant, engines and pump, reservoir, etc., for the Rural District Council. Mr. R. E. Middleton, M.Inst.C.E., 17, Victoria-street, S.W. Quantities by engineer:—
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& Co. 3,655 5 0 H. Ashley .. 3,393 8 9
A. E. Numa .. 3,577 6 2 W. G. Whitot 3,212 14 7
J. H. Vickers 3,571 0 0 R. M. Parkin- ..
son, 93, Lih- ..
W. Newton .. 3,524 18 0 son, 93, Lih- ..
& Son .. 3,524 18 0 son, 93, Lih- ..
roln - road, ..
Wilkinson .. 3,477 0 0 P o t e r - ..
Bro. 3,477 0 0 borough* .. 3,200 0 0
W. J. Wallis .. 3,416 2 2 Shroder ..
& Co. 3,416 2 2 Matthews .. 3,048 3 9

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LIVERPOOL: 6 and 8, HATTON GARDEN.
GLASGOW: 47 and 49, ST. ENOCH-SQUARE.
BRISTOL: ASHTON GATE WORKS, COPONATION-RD.

ILLUSTRATIONS.

New Roof, Magdalen College Hall, Oxford	Mr. G. F. Bodley, R.A., Architect.
Winsley House, Wilts	Mesars. Silcock and Reay, Architects.
Church of St. Chad, Longsdon	Mr. Gerald C. Horsley, Architect.
Congregational Church, Dover	Mr. F. Newman, Architect.
Dining-room, Dalton Hill, Albury	Mr. Evelyn A. Hellicar, A.R.I.B.A., Architect.
The Bridge, Aylesford, Kent.	
Remains of the Priory, Aylesford.	

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				Tenders

Condition of the Philæ Monuments.

IN a recent article upon “New Irrigation Works for Egypt and the Soudan” we mentioned the proposal for the raising of the Assouan Dam, which necessarily involves the further submersion of the temples and other buildings on the bank. That this part of the large programme now put forward is likely to be carried out is evident from the despatch of Lord Cromer, who says:—“The first work which, I venture to think, should be undertaken, is the raising of the Assouan Dam.” Although it is too late to protest, there is every reason for vigilance as to the actual extent of existing submersion, and as to the probable effect of further submersion. We have already described in detail the measures taken for safeguarding the ruins from injury,* and, in a subsequent “Note,” to the favourable report given as to the success of the undermining works. At the same time, however, we drew attention to the disturbing statement by the Director-General of the Antiquities Department—M. Maspero—as to the absorption of water by masonry above the reservoir. Further information upon both these points is now available. Sir William Garstin has recently assured the

public that, thanks to the thorough and skilful manner in which the foundations have been consolidated, there have been no signs of subsidence, and that there appear good grounds for hoping that none will occur in the future. Other testimony is forthcoming from Mr. E. Naville, the eminent Egyptologist, who visited the temples last year after the water had subsided, and his opinion is the more noteworthy because he was one of those who protested most strongly against the submersion of the temples when the project was first mooted. The following quotations sufficiently express the impression received by Mr. Naville on the occasion of his visit:—“What a change in Philæ from formerly! One can no longer call the temple a ruin; it appears, except in matters of small import, like a structure erected quite recently.” And, again:—“One may ask himself whether, in certain respects, the temple of Philæ is not to-day in better condition than the greater part of the Egyptian buildings.”

The conclusions drawn by M. Maspero, from careful inspection of the buildings during last winter, are thus stated in a pamphlet published this year:—“The established facts regarding them are reassuring, and show us that the works undertaken to enable the temples to stand the test of the water have not been in vain. The first year has passed well, and I hope that the second year will bring us no disappointment.” He adds:—“The danger of failure through undermining action of the waters appears to be averted, thanks to recent works,

and the current, if not quite *nil*, is certainly so feeble during the period of immersion that one may consider its effects as negligible.”

Referring to the same point, Sir William Willecocks said in a recent lecture at Cairo:—“A great deal of the opposition to the annual inundation of Philæ, for four or five months per annum, came from a misapprehension. People confused the damage done by the salty percolation water, which filters up through the soil in flood time and works such havoc at Thebes, with the really preserving effect of the freshly-flowing Nile water. One destroys stone, the other preserves it. The retaining walls of Philæ temple, which are annually inundated for six months per annum, are better preserved than any other part of the temple. It is the same with all stone and brickwork on the Nile. The submerged parts are better preserved than the parts which are never submerged.”

The evidence we have quoted above leaves little, if any, room for doubt as to the efficacy of the underpinning works, and removes all feelings of apprehension relative to the possible deterioration of the masonry below the high water-level of the reservoir.

But another and more serious question remains to be considered; that is, the action of the water upon the surface of the stone above the water-line. All who have inspected the buildings since the reservoir has been in operation agree in stating that along this level there is a band of saturated stone, varying from

0.60 to 0.80 metre in height. As we have previously pointed out, the saturation in question is due to capillary attraction, and it is quite established that deleterious salts have made their appearance in the band. The only remedy suggested for this undesirable development is that the masonry should be thoroughly washed every year after the reservoir has been emptied. The salts are reported as being readily removable, but at the present time it is impossible for any one to say whether such treatment will effectually preserve the stone from disintegration. In the opinion of M. Maspero, who is an acknowledged authority, no reliable decision on the point can be made until four of five years have elapsed.

From the structural point of view, the raising of the dam will simply have the effect of shifting the saturated band to a higher level. The present band of salt will be washed off, and a new band established around the upper parts of the temple. Further, the continued stability of the buildings must be better assured by the removal of the danger zone to a higher level.

No one can possibly doubt that the further submersion of the temples will completely destroy what little remains of their picturesqueness during certain months of the year, which unfortunately are the very months when tourists chiefly visit Philæ.

Assuming the reservoir level is to be raised, the public have a choice of two evils. One is to accept the position as it will then stand, the island and its buildings practically lost to sight just when travellers want to see them, and possibly suffering deterioration as a result of their annual soaking. The other is to fall in with the suggestion made some time ago, presuming this to be still open, that the principal temple should be removed and re-erected on the adjacent island of Bigh, which stands high above the waters only a few hundred yards distant from Philæ. The proposal previously made was that 200,000*l.* should be handed over to the Antiquities Department to cover the expense of removal and re-erection, and we have no doubt the building could be transferred to a suitable site for this amount. But even if the work were successfully and artistically conducted, as we are sure it would be by M. Maspero, the result would be worse than unsatisfactory. As may be seen by the plan we published on a former occasion, the entire island is covered with buildings of more or less interest, and even if the whole of them were transplanted, they would be bereft of the surroundings which have become part and parcel of their existence by long-continued association. If one temple only were to be removed it might almost as well be re-erected in Cairo or South Kensington. On the whole, we are inclined to think that the temples should be left where they are, and that the proposed removal of one of them, even if the structure appeared to advantage in its new position, would be an act of Philistinism for which it would be difficult to find any excuse.

The whole subject is rather a sad one, to those who look to the past as well as the present of the world's history. The commercial benefit to Egypt of increased

irrigation is of course immense, and it may be thought that no archaeological considerations ought to be allowed to interfere with it; and in the case of many localities in the world this would be a perfectly reasonable argument. But Egypt is altogether exceptional. It is our great link with the pre-historic past; it is the book of early art and civilisation; nor do we yet know what more may be found in it. To obliterate and drown the monuments and relics of ancient Egypt, for the sake of the modern population, may seem to the engineer and the political economist a natural and laudable course of action. But it should at least be remembered that they are wiping out records of the intellectual history of mankind, which, once destroyed, nothing can ever replace.

ROBERT ADAM AND HIS BROTHERS.

THE Essay which gained the Architectural Association Essay Prize for the Session 1902-3, on "The Life, Work and Influence of Robert Adam and His Brothers," by Mr. John Swarbrick, after appearing in the pages of *Architectural Association Notes*, has been reprinted in pamphlet form, of which a copy has been sent to us.* Though in general we should not devote a separate article to the review of a pamphlet, Mr. Swarbrick's careful and well-written monograph on the subject, for which he deserves all credit, affords an opportunity for a consideration of a career which formed an important chapter in the history of modern English architecture, and to which there is nothing analogous in the modern developments of Renaissance architecture in any other country.

To weigh correctly the reputation enjoyed by the Brothers Adam, and to assign them their position among the architects of the XVIIIth century, is not, as Mr. Swarbrick confesses, an entirely easy matter. He has nevertheless attempted a short estimate of their influence, although the greater part of his essay is occupied with a comprehensive review of their work and career, compiled, as the appendix shows, from a great variety of sources. The task is difficult, it is further explained, in consequence of the diverse character of their undertakings. This, in a sense, is so. And it is perhaps only by considering their works as a whole, as the Adams themselves treated them, that we are likely to arrive at a result.

From the "Works of Robert and James Adam" the author selects a passage which may be taken as a manifesto of the Brotherhood:—

"The massive entablature, the ponderous compartment ceiling . . . almost the whole species of ornament formerly known in this country are now universally exploded, and in their place we have adopted a beautiful variety of light mouldings, gracefully formed, delicately enriched, and arranged with propriety and skill. We have introduced a great diversity of ceilings, friezes, and decorative pilasters, and have added much grace and beauty to the whole, by a mixture of grotesque stucco and painted ornament. . . ."

In effect they meant to imply, as we read it, that the style inaugurated by

* "The Life and Work of Robert Adam and His Brothers; being the Prize Essay of the Architectural Association for the Session 1902-3." By John Swarbrick, A.R.I.B.A. Hazell, Watson and Viney, London and Aylesbury.

Inigo Jones and Wren, or at least practised by their contemporaries, Chambers and Paine, was ostentatious and meaningless, and that they sought to produce a simpler effect, though the less telling, by a combination in wall of stucco and painted ornament, and may add, the general upholstery building, played no inconceivable part. And if we look round at what was to take place in literature, poetry, and in painting, we must recognise that the Adams were not alone in their quarrel with tradition. The polished style of the Essayists, giving place to the varied interests evoked by the story, told in the simple language of Goldsmith. The stilted vocations to the Muses, practised by earlier XVIIIth century poets, was supplemented by the more homely touches of Blake, while the pompous portraiture of Kneller was rendered ridiculous by the *naïveté* of Reynolds. And in architecture we cannot doubt the tendency was the same; but, unfortunately, there was no one great enough to grapple with the problems that architecture presented. The interest of the story meets an inadequate parallel in upholsterers' art, and the simple character of Blake and Reynolds finds no echo in the baldness of architectural features.

That Robert Adam was at heart a Romanticist pure and simple no one doubts who has studied his design for the Palace," which he made in Rome in 1758 before he commenced practice. Swarbrick properly points to it in evidence of a gift for aerial perspective of Vanbrugh school. It displays this gift and in an eminent degree. But further displays a luxuriance of position and an unclarified freedom in the handling of form that is a medieval in its sentiment though clear in detail. It was never intended for execution; but it is here one is inclined to think, and not at the somewhat tame proprieties even in the Admiralty screen, that the Robert Adam will be found. Baptiste Greuze was in the same class, elected to the French Academy. A diploma picture, entitled "Sept Severus and Caracalla," was passed, and he was elected on his merits as a "genre painter"; and the distinctly pointedly made nearly broke his life. That Adam would have been disappointed had his claims as an exponent of classic art been disputed, there can be no doubt, despite his openly expressed detestation of Palladio.

We look in vain amongst his drawings for some evidence of serious study abroad. Sketches of ruins standing in appropriate surroundings bear his initials, but these are rather the excursions of a dilettante, and there seems to be little to show that he studied or measured any work. He spent some years in Italy making the *grand tour*, as was essential at that time for anyone who claimed to be a person of taste. His brother James joined him abroad. James would also have been the better draughtsman of the two, and if we may judge from the design for the Parliament House, he made there as an essay, after the manner of his brother's design for the Palace," he was also the more orthodox in his views upon classic

e was also something of a figure draughtsman, if we may rely on the drawings for the decoration of the Parliament House as being entirely his own. But two expert water-colour artists accompanied the brothers on their tour, Clérissseau and Zucchi. Robert took lessons from the former before proceeding south. They were commissioned by Robert to make copies of the decorations to be found in Italian villas and palaces, and these are very beautifully executed. One or other, probably Zucchi, must also have been responsible for the drawings of the Palace of Biondino at Spalato, which were engraved by Bartolozzi, and published in a handsome volume with magnificent type as a dedication to the King, who is compared therein to Pericles, Augustus, and the Soudan, as patron of the Arts. The temple of Jupiter at Spalato appears in the Adam designs that make pretensions to importance. The "Design for the Palace" bristles with it. It appears in the "Design for a Parliament House," and the scheme for rebuilding Lincoln's Inn, which happily never took shape. It may be found also in the designs for country seats executed by the brothers at Kedleston, for instance, where it formed a part of the "improvements" to the design after the latter's dismissal. Robert Adam commenced practice privately before 1760, and was afterwards assisted by his brother James. There were other brothers in all, but John, who succeeded to his father's business in Edinburgh, and William, also an architect, do not seem to have been much concerned in the joint productions of the elder brothers. Robert held the personal appointment of Architect to the King, and with which the publication of the volume previously referred to may not be associated. This form of homage was one of the undesirable features of the age. Commissions flowed in from wealthy clients. Kenwood was erected for Lord Mansfield, Luton House for Lord Bute, and some work at Zion House was undertaken for the Duke of Northumberland. Clérissseau and Zucchi came to England to assist. Indeed much of the brothers' business must have been taken up by the management of their business, which included extensive operations of a speculative character. Among these were the Adelphi and numerous streets, such as Mansfield-street, Grafton-street, and Bedford-place. It was shortly afterwards found necessary to dispose of the Adelphi by public lottery. Nor was their enterprise confined to building alone. They purchased the right to deal in a patent cement, and became harassed by difficulties arising therefrom. We cannot help thinking that to their remarkable activity must be attributed some of the prestige which has fallen to the names of designers. Styles are not born in a vacuum, and there is much about the so-called "Adam style" of ornament, and the moulding of it, that may be attributed to a natural development in the decorative arts, to which the Adams gave advertisement by their numerous undertakings. The Octagon at Bath was erected in 1767 by an architect of the name of Lightfoot. It is a charming piece of work, an ornament retaining the strength of the virile times and being most skill-

fully disposed. It would in ordinary phrase be called "Adam style," but it has always seemed to us to be something very much better than the Adams ever did. As regards the fittings generally, also of the Adam period, if we look at Jones's "Gentleman's and Builder's Companion," published in 1739, we shall find the same forms; it is the ornament that is lacking. Multiplication of ornament is precisely the line that development at this point would take. The furniture and the decorative trades were exceedingly active at this time. Chippendale had created a fashion that was working itself out in a perfectly legitimate manner. Heppelwhite, Sheraton, Richardson, Wallis, Wyatt, these were all active in the cause. This branch of the Arts the Adams certainly helped forward, and their folios contain many designs by experienced hands. The rough drawings, made apparently by one or other of the brothers, seem to us as even barely suggestive, and would most certainly be quite inadequate for their purpose unless their translation were undertaken by experienced workmen. We therefore cannot agree with Mr. Swarbrick that the building and decorative trades were in so decadent a condition that they necessitated an infusion of "Adam" culture.

One feature in the decoration of the period is almost universally resorted to by the Adams—the introduction of isolated panels, containing groups either modelled or representing sculpture. This was very possibly an invention of their own, and when one studies the water-colour drawings made by Clérissseau or Zucchi, or indeed any artist who made up what he considered to be a scene typical of Roman topography, panels and fragments of ancient sculpture built into the walls in a negligent and picturesque manner, are never absent. These panels and medallions appear upon the façades and in the interior decoration of all the Adams' work, and the architecture is often entirely subordinated to provide a place to receive them. A device of this kind—usually the central feature of a façade—appears in their windows. Three openings are grouped in a recess which is surmounted by a semi-circular arch. They are covered by an architrave, and the semi-circular panel is filled by a medallion. It is when the architects get right away from the accepted classic forms that we find the expression of artistic judgment in the selection of detail. A certain boldness of design was no doubt often forced upon them by the economical necessities of their enterprises, but this is generally relieved by some bits of detail possessing charm. The houses in Mansfield-street are a type; plain brick structures with openings unrelieved even by the red brick arch and jambs of the Queen Anne builder; but the design of the entrances at once imparts to them a certain distinction. On the other hand, nothing could be more commonplace than the pseudo-classic of the Adelphi-terrace façade, usually attributed to James, and it may well have been in Mr. Gwilt's mind when he spoke of "depraved compositions." In their designs for mansions, of which Luton House may be taken as an example, they abandoned the principle of attached

wings set up by Vanbrugh, and pursued in by Paine and Leoni, preferring rather to group the accommodation in a single block. This arrangement presented the opportunity of placing a series of rooms communicating with each other through which a "vista" was obtained, the "vista" being a feature upon which the architects prided themselves. This may be said to be their main contribution to the possible varieties of planning.

Mr. Joseph Gwilt was perhaps too severe when he spoke of "the depraved compositions of Adam which were not only tolerated, but had their admirers." Yet it cannot be denied that there was something of a *feu de joie* both about their style and the manner of advertising it, following upon and ending a century of serious architectural endeavour. An eminent painter once said to his critics, "You tell me that I am a very bad painter, but you must at least admit that I have been a very successful one;" and whatever view may be taken of the Adams as architects, it must be admitted that they were very successful architects.

THE TRADES UNION CONGRESS.

THE thirty-seventh annual Congress of Trades Unions was held this year at Leeds, and its meetings have extended over a week, but the questions discussed have not been those which are principally associated in the public mind as being within the province of those bodies. It is clear that the Trades Unions are still smarting under the decision given by the House of Lords in the Taft Railway case, are pledged to secure legislation which shall override the effects of that decision; but nothing new has been said on this question, and it is apparent that the principle of making the Union funds liable in case of illegal action on the part of the Unions' governing bodies has been advantageous to the country at large, and especially to the working members of the Unions. It has done more to terminate the acrimonious feeling which was springing into existence between capital and labour on account of the aggressive action of the Unions in strikes, than arbitration or any other expedient hitherto suggested; and yet statistics show that the position of labour in relation to capital has not become in any way less favourable than it was before, and that the working members have drawn direct benefit from those peaceful relations.

Mr. Horsfall (who read a paper also before the British Association on the same subject) moved a resolution on Housing Reform and the question of slum areas. Although we cannot agree with the advanced Socialistic ideas expressed by Mr. Horsfall before the British Association, much is to be said in favour of some of his views in securing attention to the growth of new areas and suburbs so as to insure sanitary houses and a free influx of light and air. Unless the local authorities exert their powers in this direction, it is clear that the municipalities will have spent the public money in vain in pulling down bad houses in the congested areas and in erecting sanitary dwellings; for unless strict supervision over the extended areas is exerted, the

slums and rookeries will only spring up elsewhere. Dr. Smart pointed out in his address before the British Association, on which we commented in our issue of September 7, that this difficulty was already being experienced in Glasgow, where the question of municipal improvement in these respects has been most carefully investigated by a Special Commission. The real problem which requires solution is, how is this supervision to be effected without paralysing individual enterprise? The purchase and holding of large areas by municipalities, which (as mentioned elsewhere) is the system prevailing in Germany, would really be the best way of dealing with the problem, but it would probably meet with much opposition in this country.

It is disappointing that the Congress expressed no opinion on the recent Report of the Departmental Committee on Workmen's Compensation—a Report in which the divergent views of the employer and the employed have been so carefully considered, and the balance between them so skilfully maintained. The Shop Assistants moved a resolution that all legislative proposals applying generally to labour should be made to include shop assistants. It is to be observed that the Committee on Workmen's Compensation did not recommend the direct inclusion of shop assistants in the Act, yet it seems somewhat questionable whether the definition of "warehouse" suggested in the Report would not to some extent include them, since the distinction created by the Courts between wholesale and retail business in this connexion is intended to be abolished by the suggested definition. The only resolution made on this subject of Workmen's Compensation ignored the existence of any Commission, although it raised points fully considered by the Committee.

The usual resolutions were carried advocating a universal eight hours' day, and the compulsory employment of unemployed at "fair wages," though no suggestion is made as to how "fair wages" are to be ascertained or obtained if the laws of supply and demand are to be superseded.

THE CASE OF AYLESFORD BRIDGE:



PROTEST has been publicly made against an intention which was announced (though there is some reason to believe that it has now been abandoned) to destroy the picturesque old bridge at Aylesford and build a new and wider one in its place, with (presumably) a better gradient. The question brings up once again the often-repeated and often-debated question of practical convenience as against historical and archaeological interest. Archaeologists are too apt to overlook or undervalue the practical side of such questions; and we preferred to make our own inspection and inquiries rather than rely on the evidence of the representatives of the Society of Antiquaries and the Society for the Protection of Ancient Buildings.

Nothing could be more picturesque than the approach to Aylesford on foot from the railway station, along the towing path which skirts the head of the Medway. First we pass the beautiful old bit of

medieval building, part of the remains of the ancient Priory, and now called "The Friars," standing on the extreme verge of the stream and reflected in its water, as shown in our illustration (see lithograph plate). From this point the bridge and the little town cannot be seen; following the curve of the river a little farther, we come on one of the most picturesque scenes of its kind to be found in England: a small wharf opposite, with houses rising above it, and above them the church tower, which stands highest of all, and in the foreground the old bridge, with its wide centre arches and small side ones, spanning the stream and leading into the town. Our illustration, which is taken further down on the bank, from the other side of the bridge, does not give the best idea of its picturesque value. It is as seen from the side of approach from the railway that it shows best, as the foreground object in a composition of river, bridge, barges, houses, and church tower. As to the essential value of the bridge in the picture there can be no doubt whatever. Destroy that, and replace it by a modern bridge, and the charm would be gone for ever.

Is there sufficient practical excuse for doing this? Intelligent inhabitants who admire the old bridge, tell us that it is a considerable inconvenience; that it is an obstruction to the river traffic (though we saw several vessels pass under the central arch without being visibly "obstructed"), and that it is awkward for carriage and cart traffic; two carriages can just pass, but not very conveniently or safely (the parapet is not high), and of course the bridge rises up over the centre arch with that inconvenient gradient which is the common property of most ancient bridges in this country. If Aylesford were a large and busy place this would be a serious argument. But it is a very small place—hardly more than a village; and the street onto which the bridge abuts is not very much wider than the bridge itself. The serious complaint as to the bridge, in relation to carriage traffic, may perhaps come rather from owners of carriages residing in the country round, who occasionally have to cross the river that way. But this is surely but a small and occasional inconvenience, and might be put up with rather than destroy an almost perfect picture. In short, we recognise that there is a certain inconvenience in retaining the bridge, but we do not think that this amounts to sufficient to justify its removal when we consider its great picturesque beauty. Aylesford would lose far more than it would gain by the change.

According to Mr. Clinch's letter in the *Times* (which is our only authority for the statement), the Society for the Protection of Ancient Buildings have drawn up a large scheme for saving the bridge, by proposing a new cut across the flat land, following the chord of the long curve here made by the river, and a new bridge near the railway station. We would rather have seen this proposed as a navigation improvement independent of the question of the bridge at all. It would be a real improvement and convenience to the navigation, but it would cost a great deal more than building a new bridge, and it may be questioned whether the idea of

turning the channel of a river to save the bridge would not appear to a good man, people a rather absurdly illogical proceeding. But in itself it would be an improvement worth making, and would have the contingent advantage of leaving the bridge alone.

Another part of the Society's scheme, that the old bridge should be widened, the addition of timber foot-passing gangways at the sides. This is one of the curious instances of the manner in which archaeologists, in dealing with the matters, are constantly putting their selves in the wrong. The bridge is built on the old and usual plan of cutwater against each pier, forming triangular refuges at the road level. The proposed timber foot-ways would destroy the whole character of the bridge, without adding to the carriage way (which is the real difficulty); you might just as well remove it entirely as tinker with it in this way; and we are certain that if any one else had made such a proposal, the Society for the Protection of Ancient Buildings would have been the first to denounce them for "vandalism."

NOTES.

SCULPTURE and the Chantrey Trust. NOW THAT more elasticity has been afforded, by the decisions of the Special Committee, to the action of the new Trustees who will before long be appointed, may it not be possible to utilise whatever surplus are expended on sculpture for placing fine works of sculpture in our public parks and squares, instead of consigning them to the Tate Gallery? A comparison of our public parks with those of other cities, such as Paris, Berlin, Vienna, and even less important cities such as Stuttgart (where a fountain was a group from a fairy-tale subject fascinates all who see it), might convince Londoners how much might be done in this way, and how little has been done. Works in marble may be too costly, delicate to expose to the open air; but works in bronze, with stone or granite pedestals, can be so placed. Those that we already have are, with few exceptions, but poor affairs; why not use some proportion of the Chantrey fund towards procuring finer examples of modern English art? For one person who would see a work in a gallery there are a hundred who see it in a park or square, and it would have the advantage of open-air lighting and of architectural foliage as a background.

THE Lord Chamberlain's Theatre Rules. THE new rules have been issued by the Lord Chamberlain's office to the theatre managers. They are more comprehensive than heretofore, but they are equitable and reasonable, and no manager can take exception to them. There are two or three notable innovations, amongst these we think the most important is the rule ordering that the scenery of the stage be rendered and maintained "non-inflammable." This is fire prevention in the true sense. It is what has been recommended by those who have had most experience in these matters for many years, and in the earlier years, a rule, was only met with ridicule.

apparently required the Chicago theatre fire to bring about this change, but now that the change has been made, and the requirement has been put into effect, we trust the rule will be honestly observed, and that the makeshift of superficially applying patent paints and like will be replaced by a thorough impregnation of the highly-inflammable materials so often found on the stage. Another notable innovation is that the rules clearly specifies that response-trained firemen should be engaged at the stage. Further, we observe that the theatre manager is now compelled to report to the Lord Chamberlain and to the Fire Brigade any outbreak of fire, no matter how small. This again is a matter of the utmost importance, because the recurrence in such matters generally finally results to some serious misfortune. Although the Lord Chamberlain is to be congratulated on the new regulations, which certainly cannot in any way be deemed hardships to those engaged in theatrical enterprise.

MR. T. C. HORSEFALL, of Manchester (well known as a pioneer in many movements for the public good), calls attention, in an admirable letter in the *Times*, to the importance of carrying out new plans around large towns upon a well-arranged plan and in such a manner as to ensure that the suburban buildings do not assist in further choking the city. Considering that we have carried out many bit-by-bit improvements in London itself, with no reference to any comprehensive scheme and no forethought as to future laying of streets, it may seem rather putting the cart before the horse, as far as London is concerned, to speak of doing in the suburbs what we have so lamentably neglected in the city. But the development of a new suburb in a special locality at any rate affords an opportunity which can be dealt with to a certain extent separately, and without being complicated by the existence or absence of a general scheme. It is at any rate desirable to see that such a new locality is laid out with wide streets and with a deficiency of open spaces; if other urban neighbourhoods have been neglected, regardless of such considerations, at least let a new one not add to the congestion. For London it is we fear too late for any general scheme of suburban extension—so much has been already done independently of any such scheme, and the area to be dealt with is so vast. In provincial cities whose belt of suburbs lies within more manageable limits, we may well take up the idea of laying them out on a general plan.

CONTINUING the same subject, we may add that in Germany, for at least twenty years, every city of note has had its "development plan," according to which new thoroughfares have been laid out due regard to public convenience, to public health, and to the due arrangement of parks and squares. In large cities, notably at Berlin, these "development plans" have been accompanied by special legislation; but as a rule, special municipal powers, or the

ordinary municipal powers backed by special ordinances from the Home Office authorities, have been sufficient to obtain what was necessary in compelling the surrounding landowners to conform to the official plan. As a rule too, but very little opposition was met with as far as these landowners were concerned, for the systematic development of the suburbs was so obviously to their interest that most of them voluntarily gave up rights-of-way and even ground in order to facilitate the wishes of the authorities. The greatest authority on the subject of the development of cities is at present Privy Councillor Stuebben, an hon. corresponding member of the R.I.B.A. In the first instance, Cologne saw its splendid development under his tenure of office as City Architect, but he was also responsible for the development plans of a number of other cities. At the present moment he is acting as High Commissioner for the Prussian Government in the development of the town of Posen, where the old fortifications and military lands surrounding the town are being transformed to the uses of civic life. Any one who has watched the systematic development of German cities during the last two decades must have been struck by the benefits accruing from the principles observed in that country.

NO EXPLANATION is at present available as to the cause responsible for the mishap which occurred at Chatham Dockyard on Tuesday last, during the erection of the new 130-ton shear legs. The three massive columns, about 150 ft. long, forming the legs of the apparatus, were in process of being hoisted into position, and when they had been raised to a height of 70 ft. an iron bollard, embedded in brick and cement to a depth of 6 ft., was pulled from its foundations by one of the wire ropes connected with the hoisting tackle and swung into the midst of the machinery. In consequence of this failure, portions of the tackle gave way, another bollard was partially displaced, and the shear legs fell upon the baulks of timber by which they had previously been supported. The columns were seriously buckled, but the machinery and the men working upon and near it were protected from injury by the timber supports. Two men were seriously injured, one by the falling tackle and the other by falling with one of the columns, although happily no lives were lost. The suggestion is made that the bollards were supposed to be capable of withstanding double the strain that was actually placed upon them, but it is quite evident that there has been some miscalculation. When a bollard is employed in the usual way, for hauling vessels by means of hawsers, force is exerted in a direction perpendicular to the axis of the post. It may be that the calculated resistance was based upon this condition, and that proper allowance was not made for the different direction of the pull exerted during the hoisting of the shear legs. Investigation will doubtless throw light upon this misadventure, which is the more surprising when we bear in mind the great care always taken by dockyard officials to provide for the safe execution of engineering work.

AN important case bearing on this subject is that of *Foulger v. Arding*, decided in March, 1902. The word "impositions" inserted in the covenants in the lease which set out the liabilities respectively to be borne by landlord and tenant placed the burden of remedying a nuisance, on the requisition of the Public Health authorities, on the tenant. In our comment on this case (the *Builder*, March 22, 1902) we pointed out what words in a lease would probably suffice to remove all liabilities of such a nature from the landlord and place them on the tenant. We have from time to time given other instances of liabilities imposed, as, for instance, the expenses of making up streets under the Private Street Works Act, and have also shown how hardly this may bear on tenants on short leases. The latest development of the principle laid down in *Foulger v. Arding* only emphasises the necessity of landlords and tenants carefully considering what their respective rights and liabilities are to be, and settling the covenants in the leases accordingly. By section 101 of the Factory Act, 1901, after January 1, 1904, no underground bakehouse is to be used unless certified by the district council as suitable for the purpose. By subsection 8, where any premises have been let as a bakehouse, and the above certificate can only be obtained by carrying out certain structural alterations, the occupier may apply to the Court of Summary Jurisdiction to have such an apportionment made of the expenses of the alterations between himself and his landlord as may appear to the Court to be just, "regard being had to the terms of the contract between the parties; or, in the alternative, the Court may, at the request of the occupier, determine the lease." In two cases recently heard—*Goldstein v. Hollingsworth* and *Morris v. Beal*—it has been decided that where premises are let as a bakehouse—which has been interpreted to mean only for use as a bakehouse—the section applies, but that the expressions "impositions and outgoings" or "outgoings" alone in the lease, sufficed to place the whole burden upon the tenant, since, even if the Court of Summary Jurisdiction did make an apportionment, the landlord, by virtue of the lease, could recover his proportion back from the tenant. The very general nature of the words used in leases makes it extremely difficult for parties to determine their position in regard to their rights under specific Acts of Parliament such as the above.

At a meeting of the Parish Council of Yarm, near Stockton-on-Tees, it has been decided to commemorate the inauguration of the first railway in the world by placing a tablet on the front of the "George and Dragon" Hotel. It was in this building that a meeting was held, on February 12, 1820, for the purpose of deciding upon the construction of the Stockton and Darlington Railway, the pioneers of the movement being Mr. Benjamin Flounders and Mr. Thomas Meynell, both residents in the town. Mr. Meynell, the first chairman of the line, took a leading part in drafting the Bill which ultimately received the

Landlord v. Tenant.

Continuation of subject from previous page.

sanction of Parliament. The original proposal was to work the railway with horse-traction, but Stephenson's steam locomotive was afterwards adopted, and powers were obtained to use it for the purpose of haulage. It is stated that of the subscribed capital of 120,000*l.*, the amount of 17,000*l.* was raised by the inhabitants of Yarm. Remembering that the aggregate length of the world's railways is now more than 510,000 miles, the historic importance of the meeting is very evident. The visitor will find nothing suggestive of progress or change in Yarm. It is, without exception, one of the most delightfully old-fashioned towns in the land. Practically the only street is the broad Market-place, paved with cobbles, save where a narrow strip of macadam runs for the convenience of modern travellers. Near the middle stands the red-brick market hall, and the tall houses on either side present interesting examples of English architecture, and varied shades of rich but mellowed colouring. Among the many old-world towns of Great Britain, Yarm occupies a unique position, and the aspect of its fine old street is not readily forgotten.

The Irrigation Conference at Simla. It is to be hoped that the conference of irrigation experts at Simla, convened by the Government of India, may have the effect of encouraging and assisting the cause of irrigation. No branch of the administration has been more successful, for fully 30,000,000 acres have been added to the cultivated land of India, or more than one-fifth of the total area devoted to agriculture, and there are now in existence 43,000 miles of irrigation canals. In spite of the great progress made during the last twenty-five years, much remains for accomplishment. In Mysore existing canals require attention. In the Lucknow and Barahanki districts canals are much needed. The Deccan and Gujarat await further development, and there are many extensive regions where nothing but water is wanted to obtain plentiful harvests from lands that are now dry and scorched by an ever-hazing sun. Bengal still presents many openings for irrigation, and in Assam very little has been attempted hitherto. To give some idea of the immense opportunities for the irrigation engineer, we may state that upwards of 100,000,000 acres of land in the Indian Empire remain to be reclaimed and brought under cultivation. Whether carried out by the Government or by private enterprise, irrigation works offer a remunerative field for British capitalists and afford a sure and permanent protection against the risk of famine.

The Light Standard for Photometry. The important paper read to the British Association by Mr. Clifford Paterson, who is in charge of the photometric department of the National Physical Laboratory, on the ten-candle power Harcourt pentane lamp, will be read with great interest by gas and electrical engineers. The gas referees some years ago adopted the pentane lamp as their ultimate standard of reference, and the Parliamentary standard candle was formally rejected. It seems, however,

that the light given out by the pentane lamp is very far from being constant. Mr. Paterson has found that it varied with the height of the barometer and with the quantity of moisture present in the atmosphere. During his experiments the candle power varied between 9.4 and 10.4, that is, a variation of 10 per cent. It seems to us that in many cases the gas companies must have been unjustly fined for failing to keep the illuminating power of their gas up to the requisite standard. The results given prove that on damp days the illuminating power of gas is much less than on dry days, and that the lower the barometer the less is the illumination produced by a flame. No hint is given in the paper as to how the pressure of the carbon dioxide present in the air was determined. In the subsequent discussion, Professor Ayrton raised the question of the sudden and apparently unaccountable variations in the light that is sent out by electric glow lamps. These variations, as a rule, are very small, and experimenters have probably often put them down to the unavoidable errors of experiment. We have evidence that these irregularities do occur in some lamps, but they are only of theoretical interest, as they are rarely appreciable. They are possibly due to the carbon filament being badly fastened to the platinum wires.

The Screen at the Admiralty, Whitehall. It was officially announced in the House of Commons at the close of the Session that the First Commissioner of Works has under his consideration the removal of the wooden shutters from the screen in front of the Admiralty court-yard. The shutters—they are in fact sliding doors—were put up after the screen had been altered for the making of the two rectangular gateways. Robert Adam's plans and designs, 1760, show a continuous wall behind five disengaged columns in each half of the screen. That the screen was so built as Adam intended, with the two blocking walls, is clearly proved by an examination we have made of his large architectural drawing of 1760, of I. Cunego's plate, 1775, contained in Part IV. of "The Works in Architecture of Robert and James Adam, Esquires," three volumes, folio, 1773-1822, and of the prints by T. Malton and by Medland, after Miller, of 1795 and 1796. In or about 1827, when G. L. Taylor was Surveyor of Naval Buildings, etc., the design of the screen was mutilated, at the instance, it is said, of the Duke of Clarence (William IV.), by the insertion of a carriage gateway in each half of the screen and the removal of the middle column, the whole number of columns being thus reduced from ten to eight. Shepherd's drawing of that time shows the altered screen, but he delineates a blocked parapet between the piers of the original arched gateway, at the middle point of the screen, instead of the existing balustrade; the balustrade is depicted in the XVIIIth century views, and does not appear to have been changed. We may mention that, in a letter printed in our columns of October 12, 1895, Mr. E. W. Hudson cites a sketch by Taylor of the altered façade, "showing . . . a cast-iron lintel

replacing the stone entablature"; and that Adam built the former gateway and pavilions at the south end of the screen as an entrance into the house of the Earl of Kinnoull.

A STRUCTURAL RENOVATION of the entire exterior of the parish church of St. Alpheg, Greenwich, is about to be carried out under the superintendence of Messrs. Thomas Dinwiddie and Sons. The church was built in 1711-8 upon the supposed site of the death of St. Alpheg, archbishop and martyr. It is distinguished by some fine woodwork and an elaborate altar-piece having fluted Corinthian columns on its three sides supporting an entablature planned triangle-wise. The tower (1730) was designed by John James, to whom also is ascribed the body of the fabric, though by no account that portion is the work of Hawksmoor. In the former church was buried Thomas Tallis, the composer who died in 1585; the present church contains a monument to John J. Angstein, whose collection of pictures forms the nucleus of our National Gallery; and who lived in the neighbourhood and a monument to General Wok whose remains were brought thither from Quebec for interment in his father's grave. In the old church was set up a portrait on glass of Humphrey Duke of Gloucester, and amongst the brasses was one in memory of Tallis and his wife Joan, bearing a quaint epitaph recording his career in the reigns of Henry VIII. and his three successors on the throne. A rare print, lettered "designed by N. Hawksmoor, A.D. 1711," shows the former tower—since rebuilt by James—which escaped when the old church fell down. In the north aisle was buried Robert Adams, with an inscription, "Egregio viro Roberto Adam operum regiorum Supervisorio, architecturæ peritissimo, ob. 1595."

In a "Note" in our column of January 22, 1898, we directed attention to the spoiling of the continuous design of the houses in Stratford-place by the raising of a house (No. 6) on the east side, with a consequent breaking through of the range of the cornice and balustrade. We notice that scaffolding is erected in front of a house, No. 17, on the west side, and that the roof has been removed for a similar alteration of the façade on the side. The street, with the mansion at its further end, is now seen to great advantage from the recently widened end of Davies-street, and affords a handsome prospect from the latter thoroughfare. We may add that Stratford-place was laid out in the Mill Hill Field of the Conduit Mead estate, the property of the Corporation of the City of London, who granted a ground lease to Edward Stratford, whose son John was created Earl of Aldborough on July 9, 1717. The houses on the two sides and the Aldborough House, at the north end, were built in or about 1774, by Robert Adam, and constituted a self-contained example of his style upon a large scale, until its destruction, twelve years ago, of No. 17 at the south-east corner, upon the removal of the Portland Club to James's-square.

No 32, Cavendish-square, W.

THERE is now being pulled down a house which is associated with the careers and works of three eminent English portrait painters. The house, now numbered 32, stands on the south side of Cavendish-square, and having been suffered to fall into disrepair, is to be rebuilt. Constructed of red brick, it is one of the original houses erected on that side of the square. The square was at first laid out, as Oxford-square, in the Harley, now Lord Howard de Walden's, estate in 1717-18; though building operations were delayed for a while by the failure of the South Sea speculation. The house was occupied, until his death in 1770, by Francis Cotes, R.A., famed for his portraits in oils and crayons, who built and decorated the studio, an apartment some 18 ft. square on plan. To Cotes succeeded, during the interval 1775-1794, George Romney, to whom Sir Joshua Reynolds could refer as "the man in Cavendish-square." After Romney's retirement to Holly Bush-hill, Hampstead, the house was taken by Sir Martin Archer Shee, R.A., in 1798, the year of his election as an Associate Member of the Royal Academy.

THE BALTIMORE FIRE.*

The Baltimore Fire is one of, if not the most interesting fire, of recent years, for although it is re-demonstrated many facts with which we are already acquainted, it has furnished us for the first time with a most thorough and complete example of the behaviour of the modern steel framed building under a severe fire test; it has also shown the weak points in these structures and where greater fire-resistance may be effected in the future.

It has re-demonstrated that all forms of stone are bad fire-resistants, and should be but sparingly used in the structure of town buildings. It would of course be impossible to abolish it altogether from an architectural point of view, but where used it should be well backed with brickwork, so that any neutral may be effected without danger to the structures. Indeed, this fire has clearly proved that the only reliable materials are brick and concrete. The hollow tile floor construction of encasing to iron-work of which we have heard so much in certain quarters has largely failed, and would have failed to a greater extent had the fire been less extensive in area. The fire brigade had been enabled to put water upon this material, for it is to be remembered that the water test was absent, and we have only the result of intense heat without the sudden cooling.

It may be a cause of general satisfaction that the last system of construction has been wisely whereby the general fabrics may, after a serious conflagration, remain standing, and it is very little consolation to the individual occupier when he can at last turn to the scene of his former labours to find that all that remains of his office equipment in a building which at the outset he is assured was fireproof, is the conglomerate remains of a typewriter and a battered iron safe.

It seems to have been overlooked by the designers of these buildings that there was as much danger from the outside as within, and perhaps more so, and no provision, or at any rate very inadequate provision was made for an attack from fire on the exterior.

I am quite convinced that had these tall buildings been more adequately equipped with fireguards from without they would have saved the fire, not as a mere constructional detail as we see them to-day, but with more of an internal trim and contents saved from the burning element.

* A paper read at the Budapest Fire Congress, August, 1904, by Mr. Ellis Marsland, District Surveyor, London; Gen. Hon. Secretary to the British Fire Convention Committee.

Beyond I think in one case where external sprinklers were used at O'Neill and Co.'s store with marked effect. Wired glass seems to have resisted the ingress of the flames in a marked degree in the buildings where it was used, and has proved itself worthy of more general adoption, but it requires to be fitted into metal frames, and I think very useful experimental work could with advantage be conducted with this material to ascertain the best method of fixing, and also whether double thickness either in the same frame or an inner frame would be more effective. In the paper read at the Fire Prevention Congress at London in 1903, on the new Entrepôt Royal in Antwerp, the method of fixing adopted there was illustrated on page 58 in a paper read by Chief Officer A. Scheepers.

I am not so sure that wired glass is the best material that will eventually be adopted for this purpose of "exposure risk," but it appears to me to be the best material now available; what we require is a transparent material with a higher melting-point than ordinary glass, and it is for manufacturers who see the want to supply the need. This fire has clearly shown that the town building owner must not be allowed to construct his building in the cheapest and flimsiest manner, trusting to the efficiency of the fire brigade to protect him from his neighbour, or vice versa. It has again been demonstrated that however efficient the equipment and however devoted the personnel of the brigade may be (and I should like to take this opportunity of expressing my admiration for the fire fighting force on that occasion), with a high wind and the fire spreading in three or four directions at the same time, the task of extinguishing is superhuman. The building owner should by his construction assist the brigade to keep a fire at the outset within reasonable limits, or to retard its progress by sound fire-resisting construction. I have carefully examined the plan of the burnt area at Baltimore, and it appears to me that the building regulations want revision so as to limit the cubical contents of buildings. From a rough calculation I find that the cubical contents of the "Hurst" building, where the fire started, was between 700,000 and 800,000 cubic ft. (20,000 and 22,857 cubic metres), and when a building of this cubical extent becomes well alight its extinction without adjoining damage is a matter of great difficulty. What is wanted is a limit to the cubical extent, and any building of the warehouse or store class should be divided into compartments by vertical walls, and any communication between each compartment should be by double iron doors properly secured. I cannot help thinking that we in London have been saved from these disastrous fires by this means; we have on some occasions had similar conditions, viz., a fire in a crowded district with a high wind, but although considerable damage has been done, the fire has been stopped mainly by the vertical walls dividing up the buildings. The London Building Act limits the cubical contents of buildings of the warehouse class to 250,000 cubic ft. (7,142 cubic metres). It would, I think, be a great advantage in buildings of this class that all roofs be flat and of fire-resisting material. A flat roof is a great advantage to the fire fighting force. Reverting to the material of which fire-resisting floors and roofs are made, I have great faith in coke breeze or cinder concrete when properly mixed and reinforced with iron, and also as a protection to ironwork generally. My faith is from actual experience, which this Baltimore fire corroborates. We have at our testing-station the roof of one of our huts constructed of this material, and although beneath it we have conducted a number of tests, some of one, two, three, and four hours duration with a temperature gradually increasing to 2,000 deg., this roof is practically as good as the day it was erected. Hollow tile has shown its deficiencies, but concrete has yet to be defeated. One word as to staircases and lifts. All well-boles around such should be encased in brick, and all doors on to same should be made to close automatically, and the top should terminate in a light glass roof, easily broken in case of fire, and thus a shaft would be formed for the escape of smoke and flame, which would thus be prevented from penetrating other portions of the structure.

Thanking you, gentlemen, for so patiently listening to my remarks, I have to thank the reader of the former paper for the information contained therein.

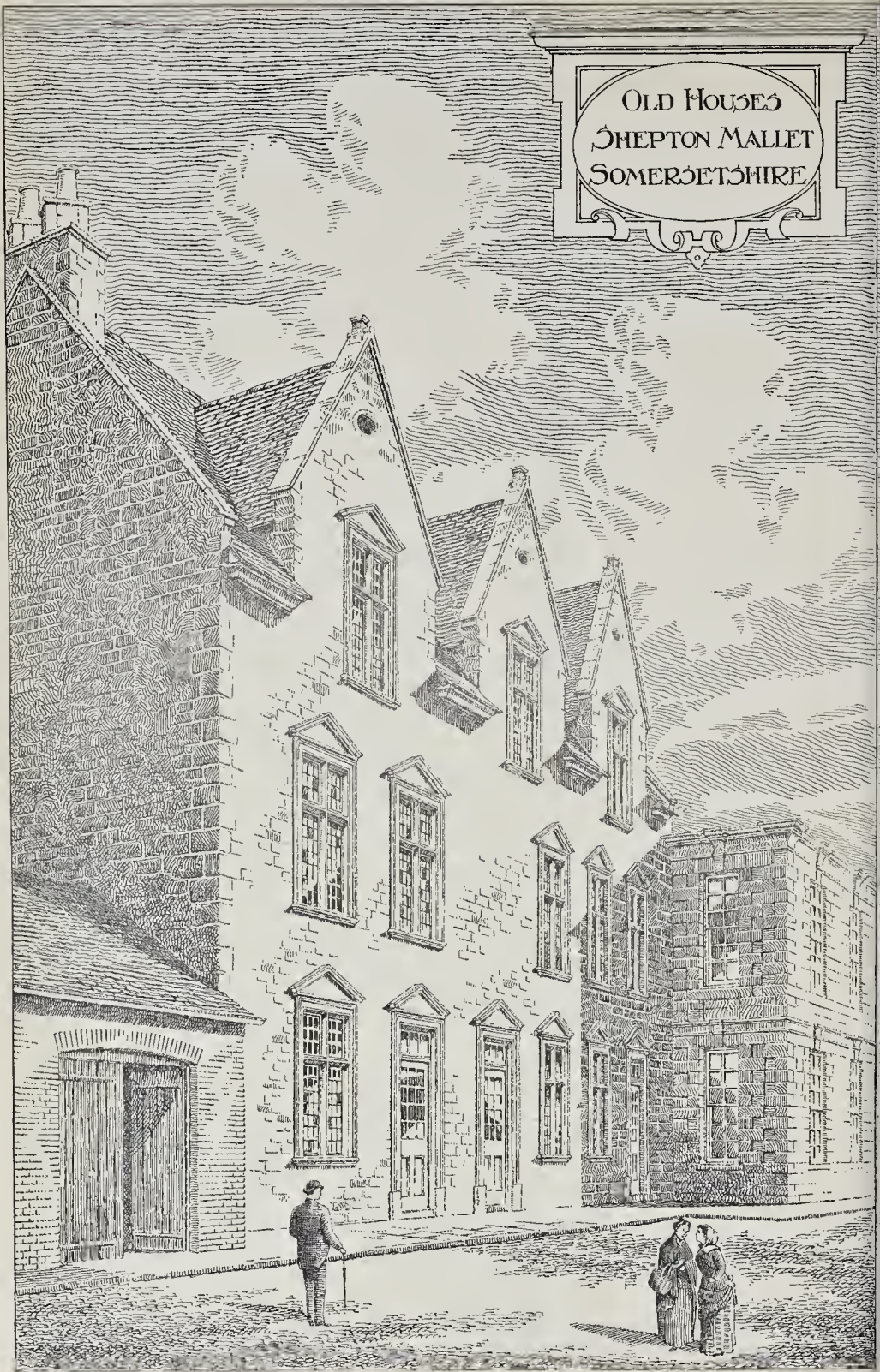
UNION OF BENEFICES, LONDON, AND HOLY TRINITY, MINORIES.

ORDERS in Council have been made for ratifying many schemes recently prepared by the Ecclesiastical Commissioners. Two of the schemes relate to the churches of St. Saviour, in London-street, Fitzroy-square, and Holy Trinity, in the Minories. In the former case the benefices of St. John the Evangelist, Charlotte-street, and St. Saviour will be united, and the Church of St. Saviour will be converted for a Sunday School or other purposes, and the proceeds of the sale of the parsonage-house are to be applied towards the provision of a parsonage-house for St. George's, Enfield. St. Saviour's was built of brick, as Fitzroy Chapel, after designs by the brothers Adam, at the time when they laid out Fitzroy-square, of which they completed the east and south sides in 1792-4, and, having been altered for 1,000 seats by J. Peacock, was consecrated and re-opened in July, 1864. The union of the benefices of Holy Trinity, Minories, with St. Botolph, Aldgate, having been effected, the residue of the endowments of the former benefice are to be allocated to the incumbent of St. Mary, Stratford-by-Bow. Holy Trinity Church, at the east end of Church-street, formerly Little Minories, was built in 1706 to replace the Minory House chapel of the parish, about 5 acres in extent, and one of the Tower Liberties, that had been constituted out of the close and precincts of St. Mary's Abbey. That convent of Franciscan nuns was founded in 1293 for Poor Clares, or *Sorores Minores*, by Edmund, Earl of Lancaster, surnamed Crouch-back, and his second wife, Blanche, Queen of Navarre. Fragments of the abbey buildings have been found in the front, since modernised, of Haydon House, and after the fire of two or three weeks ago, in the north wall of the church, which was closed in January, 1899, and converted into a mission-room. After the surrender by Dame Elizabeth Salvage, last titular abbess, the property was granted to John Clerke, Bishop of Bath and Wells, the precincts became a colony of metal-founders and gunsmiths, and around the fountain was built Haydon-square, so named after Sir John Heydon, Lieutenant of the Ordnance. In the old church Edward I. deposited the heart of his mother, Queen Eleanor of Provence; the interments comprise those of Bishop Clerke, and some Scotsmen who fought on Drummoissie Moor, Culloden—an adjacent public-house in the Minories has the sign of "The Three Lords"—Edmund de la Pole, Earl of Suffolk, his wife, and their daughter, a nun of St. Clare. A relic used to be shown at Holy Trinity as the head of Lady Jane Grey's father, the Duke of Suffolk, who held the Minory House by grant from Edward VI., but there is reason to believe that the head belonged to Edmund de la Pole, Earl of Suffolk, whom Henry VIII. decapitated in 1513. The registers record the burials of Cornelius Dribbel, a Dutchman, "his Matle chief Ingencere" (October 16, 1633), who should share with Fontana the credit of inventing the microscope, and (1670) Colonel William Legge, King Charles I.'s faithful servant, who received a grant of the Minory, rebuilt as the King's House, from Charles II., and was Lieutenant of the Ordnance. His descendants, the Earls of Dartmouth, had a right to sepulture in the vault under the chancel. The inscription on the marble monument gives, wrongly, the date of his death as "1672." Sir Philip Sidney's body lay in state in the church, and was carried thence by the Grocers' Company to St. Paul's.

GLASGOW.—Mr. Roscoe Mullins's fine group of Isaac and Esau:—"Bless me even me also O my Father," which has been exhibited twice at the Royal Academy, in plaster in 1884, and in marble during the present year, is at present on view at the Sculpture Gallery, Kelvin-grove, Glasgow, where it will remain for twelve months.

PROPOSED COTTAGE HOSPITAL, MOFFAT.—The directors of the proposed cottage hospital at Moffat decided, some weeks ago, to approve of the plans prepared by Mr. H. W. Walker, architect, Edinburgh, and instructions were given to prepare working plans. In the interval some opposition has arisen to the adoption of the plans, and objection was taken to restricting the competition to two architects. At a subsequent meeting of the directors the plans referred to were disapproved of, and it was resolved to invite competitive designs.

OLD HOUSES
SHEPTON MALLET
SOMERSETSHIRE



OLD HOUSES, SHEPTON MALLET.

SHEPTON MALLET, which is about 5 miles from Wells, is a quaint old town. The chief interest to the architect lies in the church and market cross, both of which are well known; and there are several good examples of domestic work, the best being the houses shown in the accompanying sketch. They are in an excellent state of preservation and form, with their red-tiled roofs and steep-pitched gables; a picturesque group, but being situated in a very narrow street, some distance from the main road, are little seen. W. EATON.

Books.

Pioneer Irrigation: a Manual of Information for Farmers in the Colonies. By E. O. MAWSON, M.Inst.C.E., Executive Officer, Public Works Department, Bombay. With Additional Chapters on Light Railways, by E. R. CALTHROP, M.Inst.C.E., M.I.Mech.E. Illustrated by numerous plates and diagrams. London: Crosby Lockwood and Son. 1904.

THE title-page indicates, this book was written with the object of affording information to pioneer settlers on the subject of irrigation. The additional chapters on light railways may seem to be a little out of place, and perhaps might be more suitably presented in an extended form as a separate volume under the title of "Pioneer Railways." It is the fact, however, that irrigation and railways should go hand in hand whenever practicable, and for this reason we who are occupied in the development of irrigation in new countries will find the inclusion of this second subject both helpful and convenient. Chapters I. to IV. contain detailed instruction on various preliminary works connected with the supply of water, and, speaking generally, such undertakings are suggested as can be executed by an intelligent and resourceful settler unable to command professional advice or skilled labour. In Chapter I. the author gives some striking figures in proof of the value of irrigation. For example, he states that in South Africa the selling price of irrigable land not provided with water varies from 3s. to 3l. per acre, while when provided with annual irrigation it is worth from 20l. to 100l. per acre. Again, we are told that the fruit lands of Arizona and California are almost useless until they are watered, after which they become worth 50l. to 60l. per acre, while vines in good positions with first-class water rights are valued at 200l. to 300l. per acre. Particularly profitable results are quoted with respect to India and Egypt, the pioneer countries of irrigation. In America this department of agriculture has developed very much during recent years, and in South Africa the Government and the agricultural classes are at last beginning to think seriously of operations on a large scale. In Australia there are immense tracts of land, now subject to permanent or intermittent drought, and through which the rivers are allowed to carry away great volumes of flood water, that would be worth their weight in gold if intelligently stored and utilised. Much misery has been suffered, and is still being suffered, in some parts of Australia by neglect of irrigation works, and we are pleased to think that Mr. Mawson's work may have the effect of awakening many owners and occupiers of land to a sense of their obvious duty in this direction. Having disposed of preliminaries, the author deals with the construction of dams and weirs in Chapter II. Settlers in new countries generally make a point of choosing their homes near watercourses, and in any such situation the escape of water can be effected at comparatively little expense by the building of a weir, or the raising of a dam to form a reservoir. In the case of an overflow weir must be provided to permit the escape of surplus flood water. The proviso that no dam higher than 10 ft. above the bed of the stream should be built without professional advice, the author details the methods of construction suitable for adoption by pioneer farmers, giving sections of masonry, earth-filled, earthen and timber dams. Similar treatment is pursued in the case of weirs, and full account is given of "automatic weirs," the usefulness of which depends on the rapid and automatic opening of the sluice gates, which form a movable crest, when the river is in flood. Simple directions are also given for the construction of head gates, or regulators, for controlling the supplies of water to irrigation canals, and for preventing the flood waters of a river

from entering such channels and thereby causing injury to the banks. We may here observe that several views of dams and weirs illustrating this chapter represent undertakings of far too ambitious character for execution by settlers having no technical knowledge or experience, but this reservation must not be taken as applying to the more simple works, the construction of which is so lucidly explained by the author. The construction of irrigation channels, flumes, iron trough and pipe aqueducts should offer no great difficulty to the man who is accustomed to work upon land, and by following the rules given in Chapter III. the intelligent cultivator ought to be able to provide adequate means for the distribution of water stored in his reservoir or held up in the bed of the stream passing through his lands. Recognising the fact that sources of water supply are not always to be found on the surface, the author wisely devotes a chapter to "Underground Water," pointing out the value of wells, horizontal bores, and open galleries. The hints offered with regard to the first of these classes of work cover matter that is fairly well known, but the description of the methods to be adopted in making horizontal bores and open galleries will probably be found less familiar to many readers. It is pointed out that the most economical means of raising water from wells is by windmill pumps, which are very largely employed for irrigating fruit gardens in America, and, we may add, are now becoming general in this and other countries. Other types of pumping machinery are discussed in the same chapter, but as most of these involve the use of animal or steam power they are naturally to be avoided wherever possible. We now arrive at one of the most useful chapters in the manual. This, entitled "Methods of Irrigation," contains much excellent advice which the experience of the author thoroughly qualifies him to impart. The practical success of every method essentially depends upon knowledge. On this point we cannot do better than to quote the words of the author:—"The knowledge of the best way of applying water to the crop, and the amount necessary, forms one of the most important factors upon which depends success in irrigation operations. . . . Both the crop and soil must, therefore, be considered when determining the amount of water to be used in each case, and the exact quantity required can only be determined by experience. Until this experience has been gained there is a strong tendency to use too much water. This is the greatest mistake, and it is better to use too little water than too much." After further advice of this character Mr. Mawson describes and illustrates different methods of distributing water, and concludes the chapter with a reference to "Inundation Irrigation," and the conditions under which it may usefully be adopted. Passing over a short chapter on "Sewage Irrigation," which is a subject scarcely likely to interest pioneer settlers, attention will be briefly directed to the subject of "Automatic Sluice Gates," considered in Chapter VII. Apparatus of this kind is so constructed that as the volume of the flood increases or diminishes the sluice gates adjust themselves automatically to the flow, opening and closing in proportion as the volume of flood water increases or diminishes. With non-automatic gates there is always the risk that those whose duty it is to open the gates may neglect to do so in case of flood, and the attention of all cultivators of land may well be called to the type of apparatus fully described in this chapter. Mr. Mawson next devotes himself to the discussion of cultivation as applied to cereals, vegetables, and fruit trees, which, although a most important branch of work, does not here require more than passing mention.

With regard to "Light Railways," forming the subject matter of Chapters IX. and X., it may be said that such works are only second in importance to water supplies in the development of new countries, for they afford means by which agricultural products are greatly increased in value. It is scarcely to be expected that settlers will be able to build and equip even light railways without professional assistance, and undertakings of this kind clearly demand co-operation between the chief occupants of land along the proposed route and the inhabitants of the objective market or markets. Mr. Calthrop, the author of the two chapters here in question, has had considerable experience in connexion with the design of light railways, and the information he now gives should be sufficient to enable the layman to

appreciate the essential features of such means of transport, and to obtain a good idea of the most suitable types of rolling-stock for employment under different conditions.

In conclusion, we may say that throughout the volume the subjects selected are satisfactorily discussed in simple language perfectly intelligible to the non-technical reader. Mr. Mawson has succeeded in demonstrating how available water supplies can be applied to the irrigation of crops by means of comparatively inexpensive works quite within the reach of the class to whom his work is addressed, and Mr. Calthrop has conveyed in a similar manner much useful information with regard to railway transport. The numerous diagrams and other illustrations add greatly to the value of a work which will be read with profit and pleasure by those who are interested in the development of lands in arid and semi-arid regions.

Transactions of the Institution of Civil Engineers of Ireland (69th Session, to May, 1903). Vol. XXX. Dublin: Printed for the Institution by JOHN FALCONER. 1904.

ALL the papers reprinted in the present volume of transactions are of marked interest. Mr. Mark Ruddle deals with the electrical transmission and transformation of energy, a rival to old-fashioned methods so convenient and efficient that it already bids fair to oust its older competitors from many fields of work. The author devotes attention more particularly to the application of electricity to motive power in workshops and factories. An exhaustive paper on "The Destruction of Town's Refuse," by Mr. H. Norman Leask, will well repay careful study, and "Some Notes on Route Surveys with the Plane Table in Egypt," by Mr. J. T. Trevor Dillou should be read by surveyors who contemplate going abroad, as it contains many practical hints that are seldom conveyed in text books or courses of lectures. Mr. W. E. Lilly discusses "The Design of Plato Girders," pointing out that the rough and ready rules now in use and based on hypothetical conditions, lead to excess of material in the web of such members. The treatment as put forward in this paper differs considerably from that generally given in engineering treatises, and a method proposed by the author of treating the web section as divided into two parts for the purpose of calculation is quite new, and worthy of examination. Some points of great importance are raised in the instructive paper by Mr. Allanson-Winn, on "The Voughal Foreshore Protection Works; and Deep Sea Erosion on the East Coast of England." The author says:—"Local authorities too often consider only what they can see—falling cliffs, wasting beach, and broken-down walls, groynes, etc., for which they have paid heavily. They do not realise that the trouble is brought about mainly by the advance of deep water, and even when this is fully explained and proved they exhibit a tendency to ignore the facts because they are unpleasant ones." Mr. Allanson-Winn has devoted much time to the question of deep sea erosion, and the aspect of the foreshore protection problem which he here puts forward is distinctly novel, and demands at least the most searching investigation.

Builders' Hoisting Machinery, with Numerous Illustrations. Edited by PAUL N. HASLUCK. London: Cassell and Company. 1904.

AMONG the contents of this little handbook the mechanic or builder's foreman will find many items of useful information, conveyed in simple language and in a manner likely to be appreciated by all practical men. Simple lifting tackle, winches, crabs, and cranes of various types are described, and their details of construction discussed. In the last chapter the reader will find a brief but complete account of the different methods by which motive power is applied to the operation of hoisting machinery. The handbook comprises some eighty-three illustrations and a well-prepared index. It is an excellent manual for those desiring general, and more or less elementary, information upon the subject discussed.

Particulars of Docks, Wharves, etc., on the Thames. Compiled by CHAS. H. JORDAN, M.I.N.A. Second edition. London: E. and F. N. Spon. 1904.

THIS is a useful small publication giving in tabular form the particulars of docks and wharves on the Thames. Those of the docks



GROUND PLAN.

FIRST FLOOR PLAN.

Winsley House, Wilts.

give measurements, with the names of the proprietors and other particulars. The list of wharves gives name, situation, and proprietor's name. There is also a good series of maps of the reaches of the Thames below bridge, with the docks and the places situated on the banks. The whole is very well and carefully done.

BOOKS RECEIVED.

HOW TO COLLECT OLD FURNITURE. By Frederick Litchfield. (Geo. Bell and Sons.)

Illustrations.

NEW ROOF, MAGDALEN COLLEGE HALL, OXFORD.

THE new roof, shown in the illustration, replaces a poor plaster one of comparatively modern date, and incongruous character. The old stone corbels only remained, and signs of the pitch of the original roof were alone visible.

The roof is of English oak throughout and is covered with lead. The window in the eastern end of the hall had been walled up. It was found to be much injured, and it has been made good to what was probably the old design, and has been filled with good heraldic stained glass. A new fireplace has been put in the hall. The roof has been carried out by Messrs. Rattee and Kett, of Cambridge, from the design of Mr. G. F. Bodley, R.A.

WINSLEY HOUSE, WILTS.

This house has been erected upon the site of an old house, and is built entirely of stone quarried upon the site, the roof being covered with old stone tiles collected in the neighbourhood.

The plan is of a somewhat unusual form, and was determined by attempting in the first instance to alter and add to the existing house; the old work was, however, found to be in such a bad condition, that it became necessary

to entirely rebuild, the lines of the original plan being retained.

The ground floor contains a large hall, drawing-room and library, in addition to a kitchen and offices. The first floor has eight bedrooms and a large billiard room with an oriel window, and there are seven bedrooms on the second floor.

The contractors were Messrs. J. Long and Sons, and the clerk of the works, Mr. E. J. Trotman; the architects being Mr. T. B. Silcock and Mr. S. S. Reay, of Bath and London. The two views now published were hung in this year's Royal Academy Exhibition.

CHURCH OF S. CHAD, LONGSDON, STAFFORDSHIRE.

This church is being erected at Longsdon, near Leek. The foundation stone was laid by the Bishop of Shrewsbury in October last. The church consists of a nave, north aisle, chancel, priests' and choir vestries, and will accommodate about 350 people. Ladder-edge stone is used for the walling, and Red Alton and Roches stone for the windows, piers, quoins, and other dressings.

The general contractors are Messrs. Thomas and Henry Grace, of Leek. The architect is Mr. Gerald C. Horsley.

CONGREGATIONAL CHURCH, DOVER.

This church is built to accommodate the congregations of two smaller ones in the town. In accordance with the wishes of the Committee it is designed in the Gothic style of the XIVth century (treated in a somewhat free manner).

The walls are of Kentish rag with freestone dressings. The roofs are covered with local tiles. The woodwork generally inside is pitch pine. The seating, supplied by Bennetts, is of oam. The heating apparatus by Grundy, and the electric lighting by Wright and Sons, of Dover.

The site being very cramped, and seating accommodation required for 650, nearly the whole area is covered by the building; the windows in the side walls are, therefore, liable to be interfered with by adjoining owners. In order

to obtain light that cannot be so obstructed, a large window is placed in the east wall facing the street, and a sort of clerestory of windows formed in the roof; the principals are carried to the side walls, and are cased and rough cast outside, showing above flat as a kind of buttress.

The cost will be under 7,000*l.*, exclusive of site.

Messrs. R. and G. Brisley, of Dover, are the builders, and Messrs. Cresswell and Newnham and Beeston, also of Dover, the architects.

The drawing was exhibited at the Royal Academy this year, under the name of Mr. Newman only, as in the title on the plate.

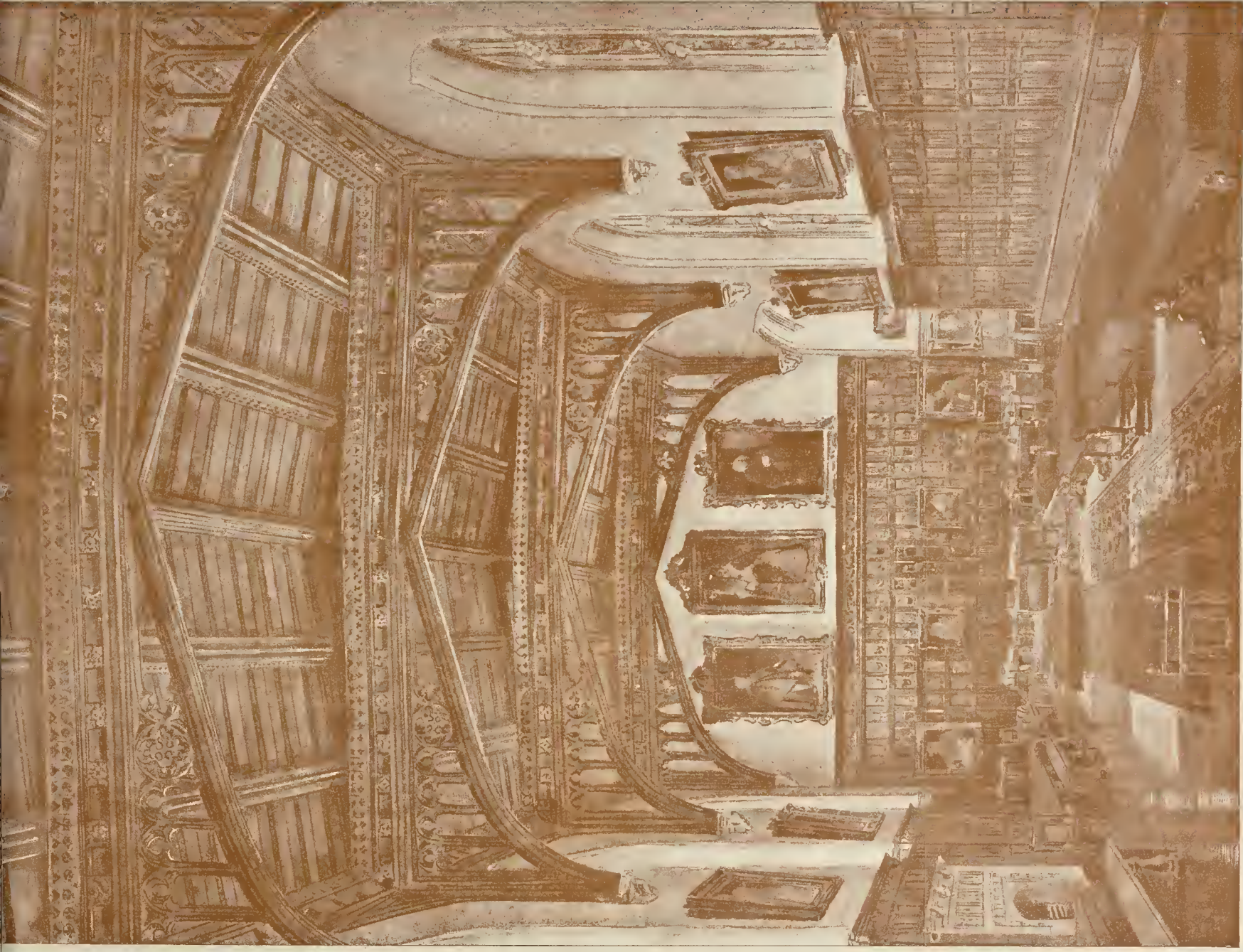
DINING-ROOM, DALTON HILL, ALBURY.

This is a dining-room which formed part of some additions to Dalton Hill, Albury.

The work was carried out by Messrs. Mitchell and Sons, of Shalford, Guildford. The joined work is in fumigated oak; the windows are lead-glazed casements set in the stonework. Mr. Evelyn Hellicar was the architect.

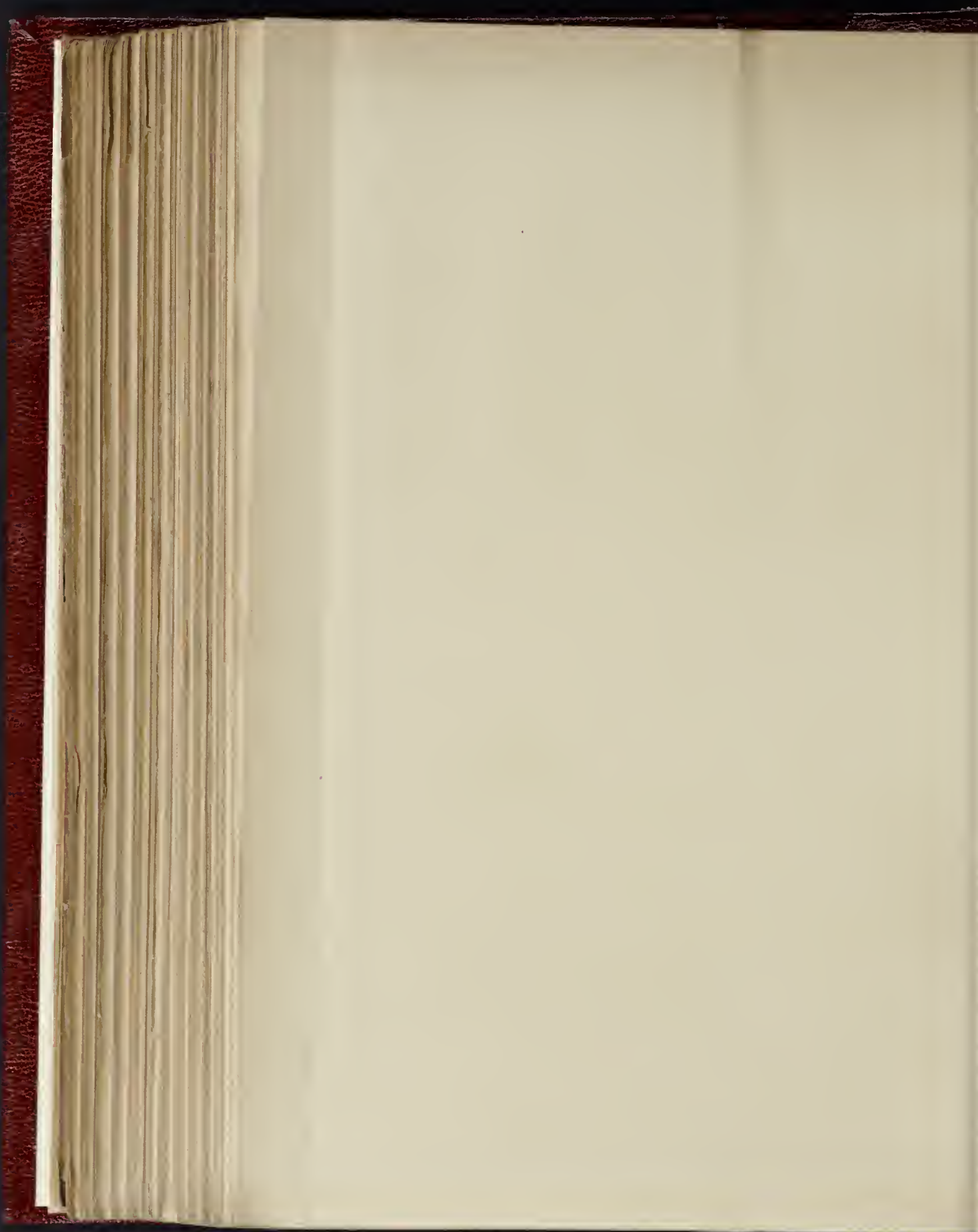
AYLESFORD BRIDGE AND PRIORY.

The illustrations of Aylesford Bridge and the portion of the ancient priory now known as "The Friars," are from photographs, which we are indebted to Mr. Chinch, of the Society of Antiquaries. Aylesford Bridge, the only one that spans the river Medway between Maidstone and Rochester. It was built in the XIVth century, and though two of its arches have been made into one to meet the demands of later traffic, it presents a general appearance a likeness to the co-eval bridge across the river at Farleigh, about five miles above Maidstone. It was originally known at the ford on the British road, latterly known as the Pilgrims' "Way," along which tin ing were carried from the west of Britain to Rutupia or Sandwich haven. One can follow to-day the ancient, but now deserted, road which, as lately as the middle of the XVth century, was known as the "King's Highway," from Westerham to Shoreham (in Kent) Skirting the forest of Anderida and traversing



MR. PHOTOGRAPHER'S... A. S. EAST-ANDING STREET, LITTLE ANNE ST.

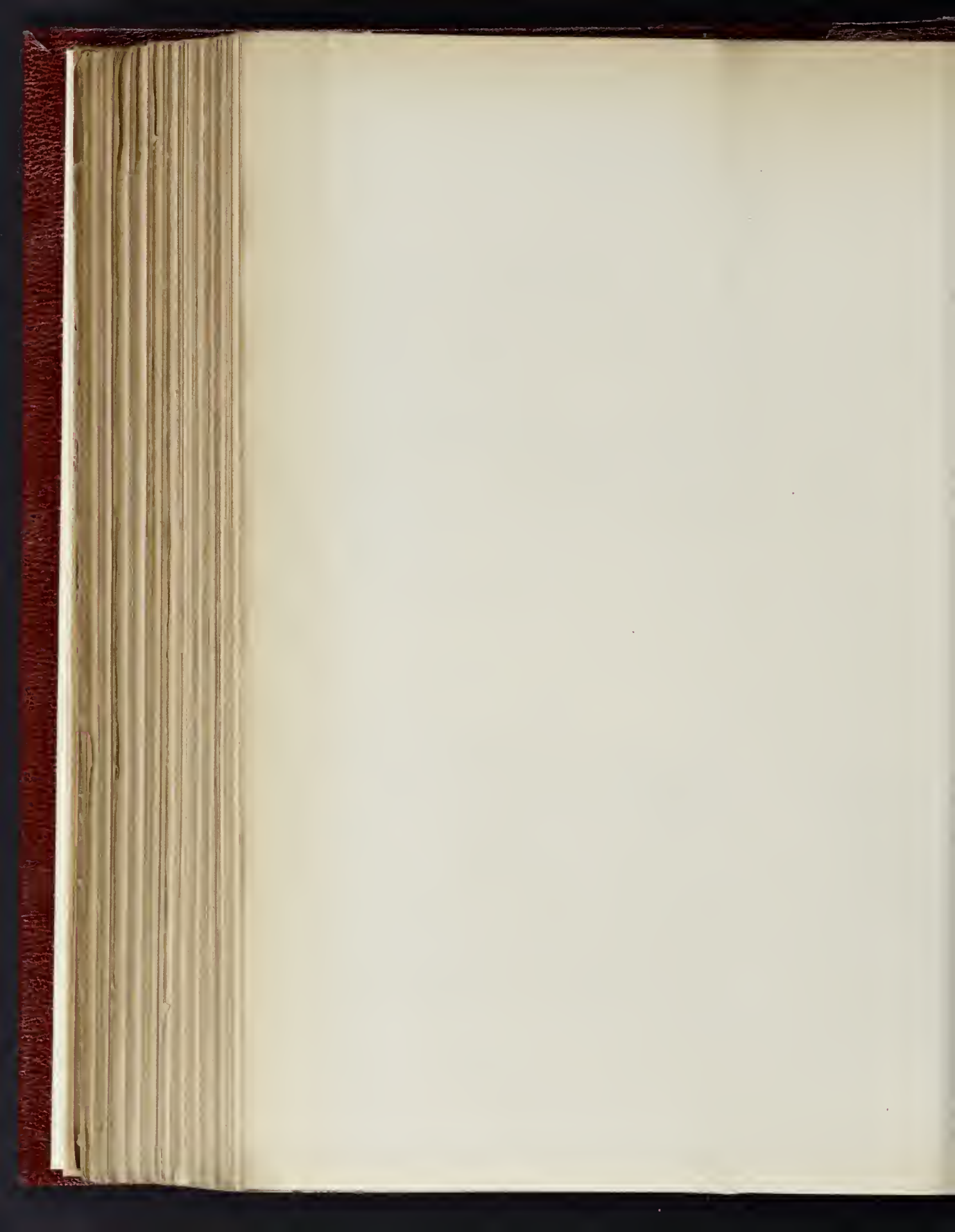
NEW ROOF, MAGDALEN COLLEGE HALL, OXFORD.—MR. GEO. FREDERICK BULLY, R.A., ARCHITECT

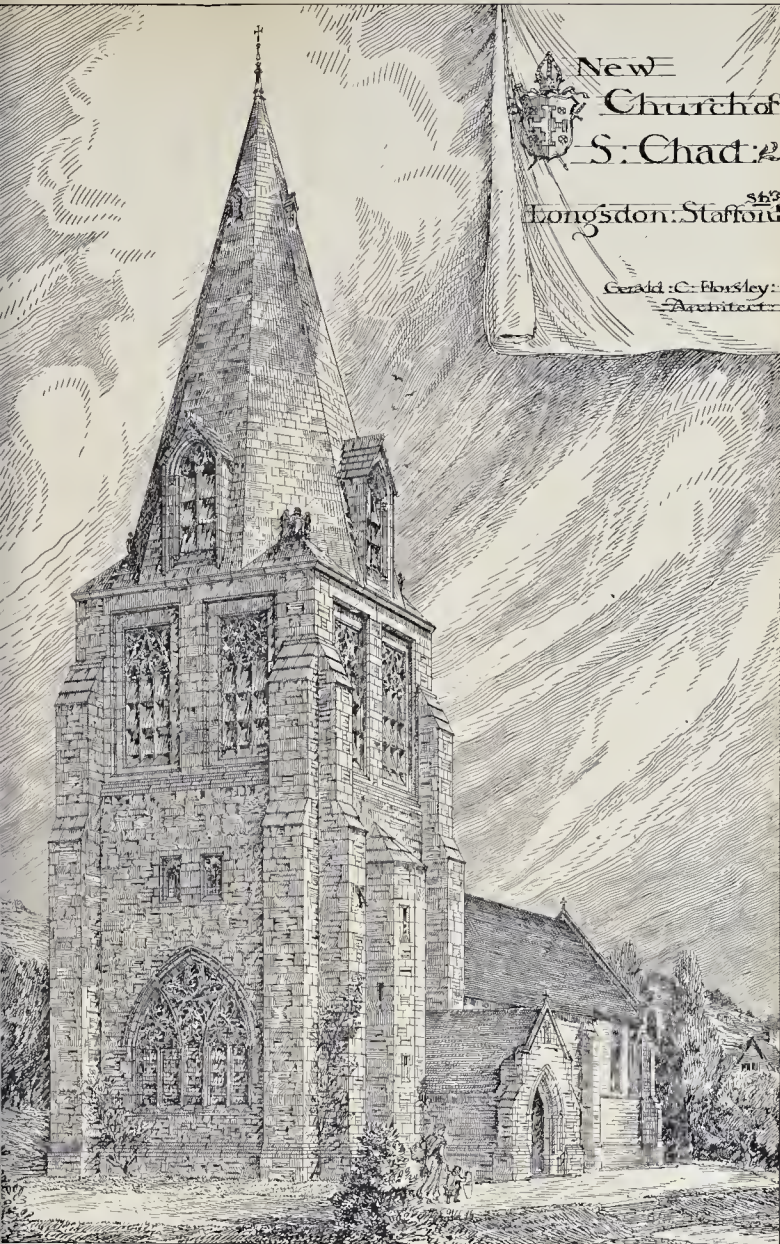


WINSLEY HOUSE WILTS

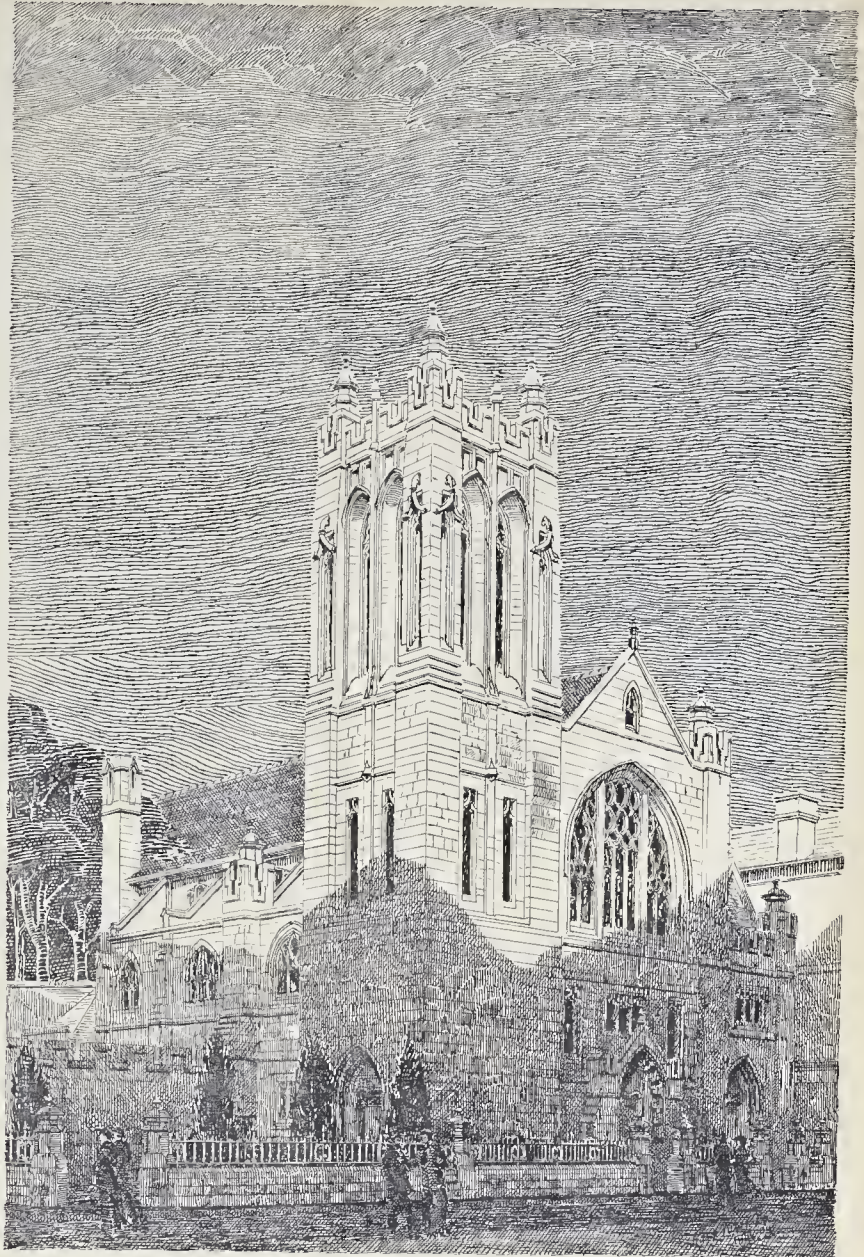
SILCOCK & REAY · ARCHITECTS





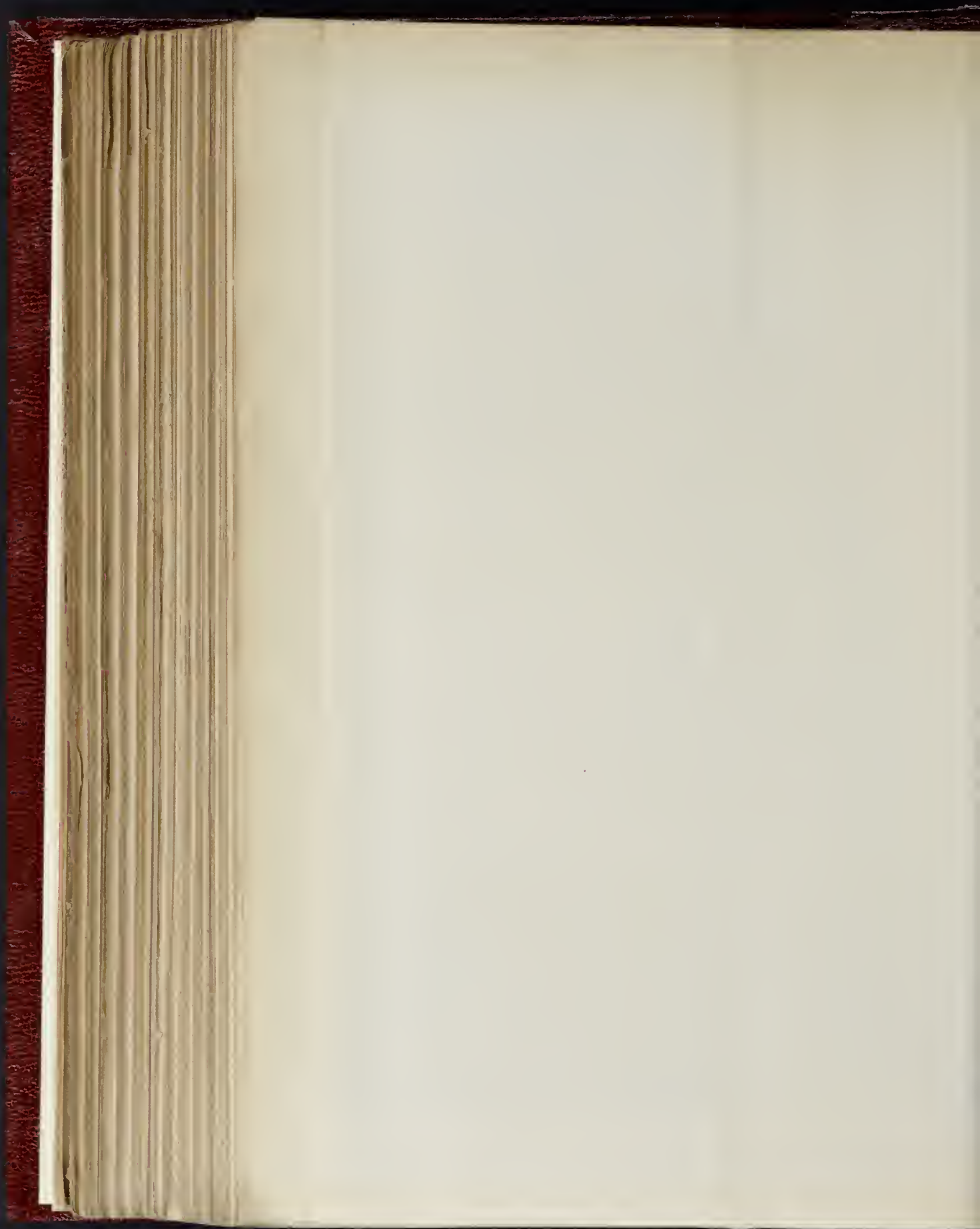


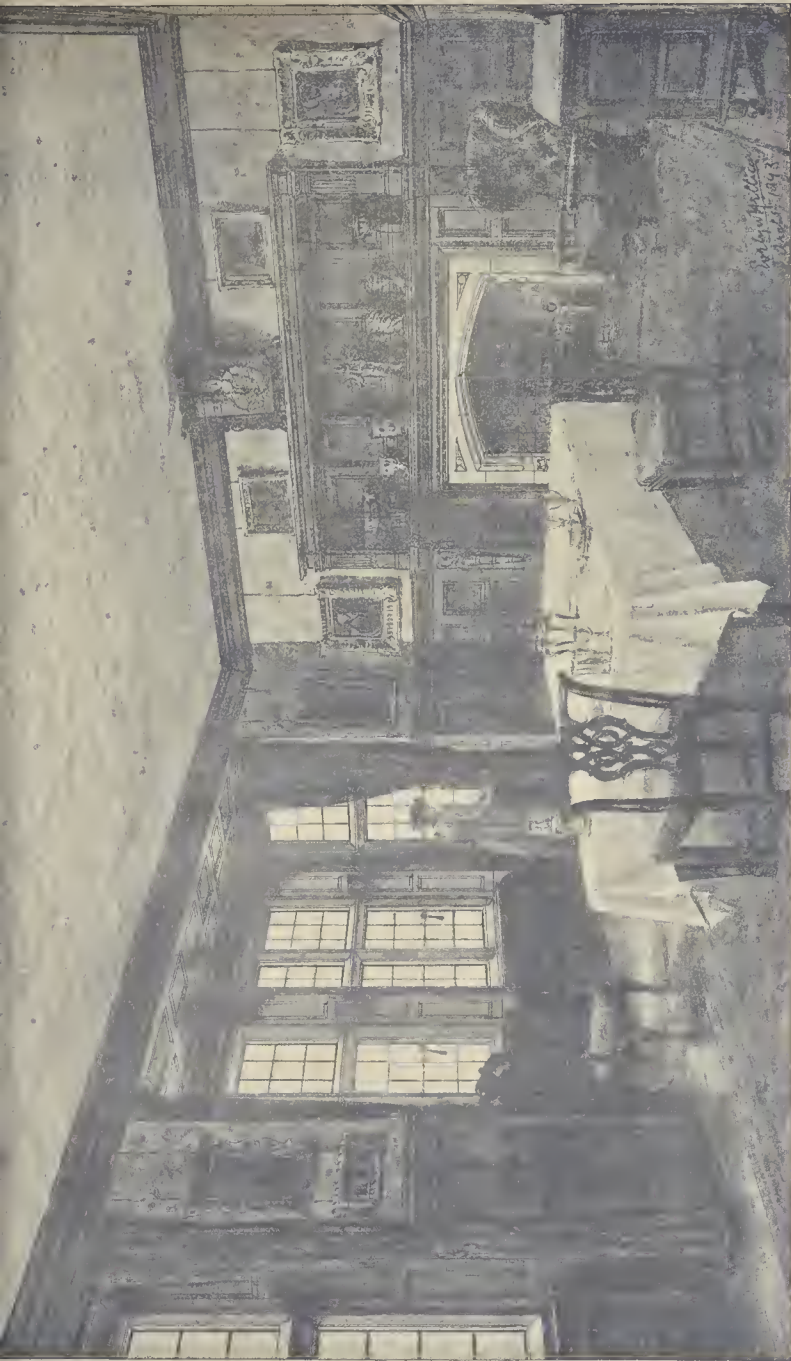
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CONGREGATIONAL CHURCH, DOVER.—MR. F. NEWMAN, ARCHITECT.





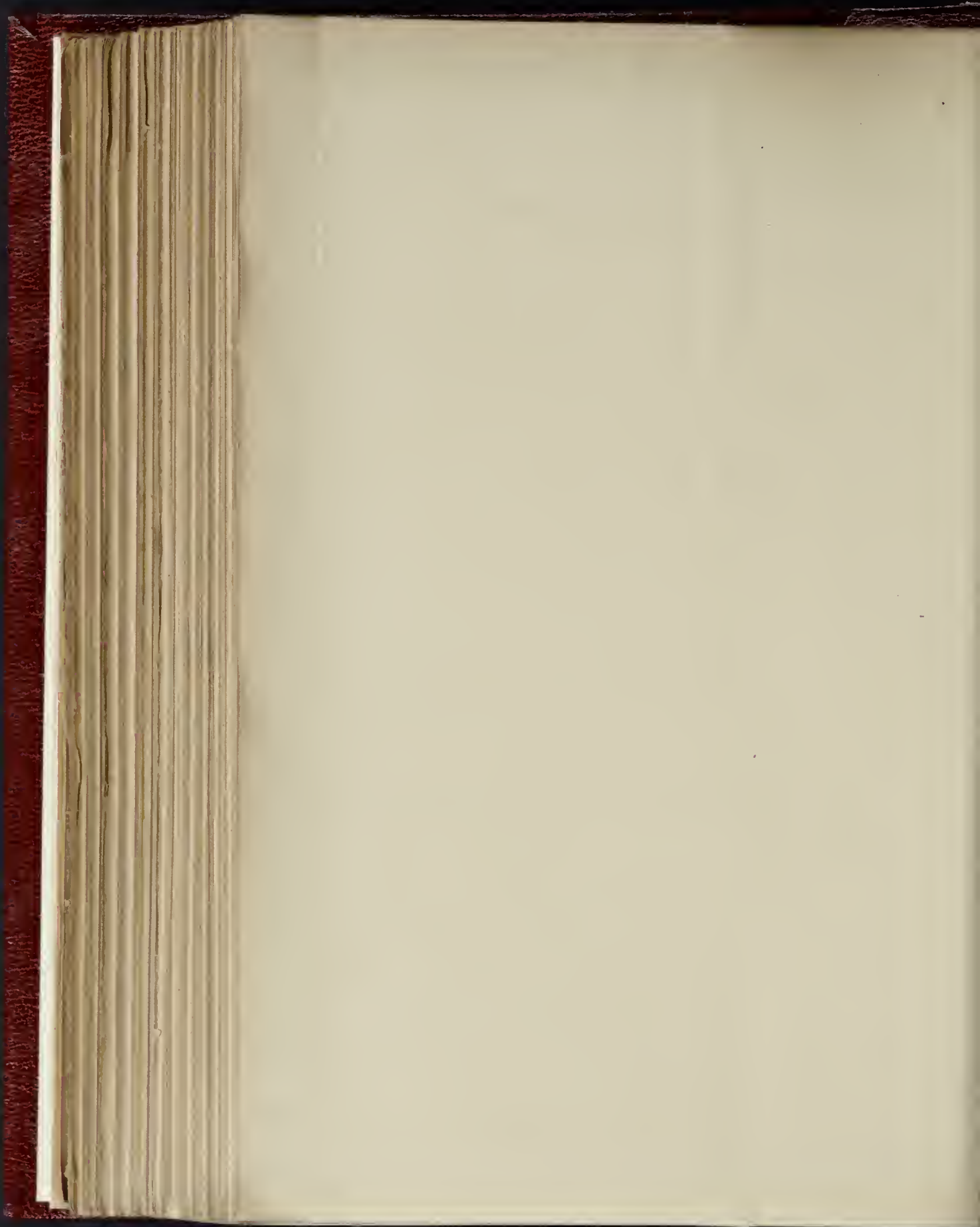
DINING ROOM, DALTON HILL, ALBURY.—MR. EVELYN HELLICAR, A.R.I.B.A., ARCHITECT.

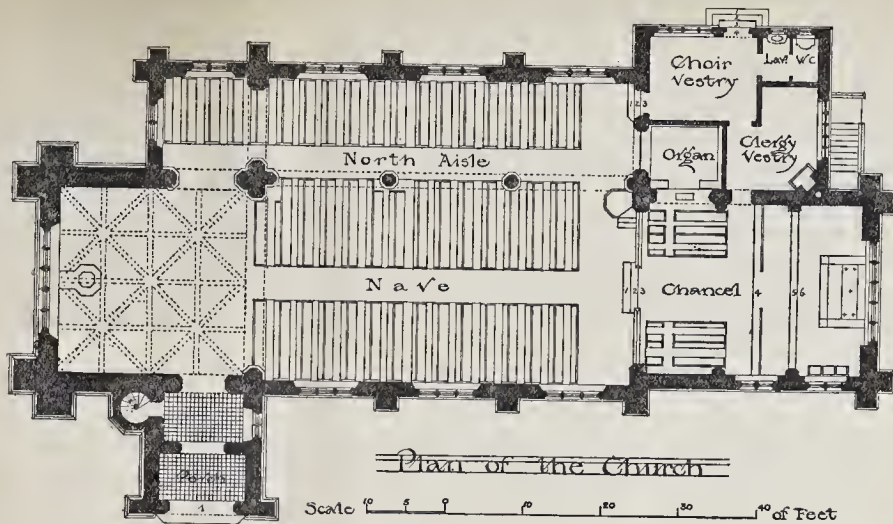


THE BRIDGE, AYLESFORD, KENT.



REMAINS OF THE PRIORY, AYLESFORD.





Church of St. Chad, Longsdon. Plan.

mpshire and Surrey, it marches with the
ge of chalk hills which extend through Kent
n Eynsford to Hythe. The road enters
nt near Titsey in Surrey, close to Westerham,
sues its course to Chevening, thence across
valley of the Darent to Otford, along the
thern slopes of North Downs to the Medway
ey, and so through Aylesford to Boxley,
lingbourne, and Charing. The grass-grown
ck is marked by the yew trees planted
g its sides, as well as by several British
thworks and remains of the Roman occupa-
n in its immediate vicinity. Before the main
d was made through Maidstone the pilgrims
sed through Aylesford on their way from
thampton and the south-western ports to
martyrs' shrine at Canterbury. The ford
ommemorated in the name of the town, the
on Eglesford, and the Eylesford of the
nesday Survey, wherein some discern the
ne of Eigel, the renowned archer.
he question as to the proposed removal
the bridge, and its picturesque value, is con-
d on another page.

The Student's Column.

NOTES ON PORTLAND CEMENT. CHAPTER VIII. (Continued).



WHEN cement is mixed with a certain amount of water a plastic paste is formed which stiffens after a time and then hardens so as to resist slight pressure. According to Le Chatelier's theory of supersaturation, the time which elapses from the addition of the water till supersaturation takes place is the "initial set." When the cement cake resists a certain pressure it is said to be "hard set."

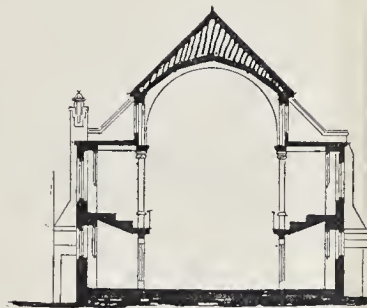
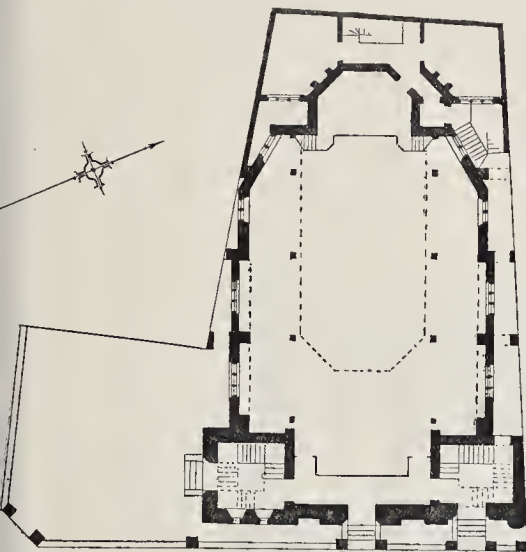
There are a number of methods of determining these points, none of which are entirely satisfactory, but the most generally adopted method is to bring a weighted needle of a certain section down gently on the cake. When it fails to penetrate to the bottom the "initial set" is said to have taken place; when it leaves no visible impression on the surface the

cement is "hard set." With quick-setting cement the "initial set" is clearly defined owing to rapid crystallisation; with slow-setting varieties the change is often so gradual that the point is not absolutely definable. The *modus operandi* is as follows:—

The cement is mixed with just sufficient water that after thorough mixing, so that all the particles become wetted, a stiff paste is obtained. This is spread on a clean glass plate into a cake about 1/2 in. thick, and tried from time to time with the needle till it is found to be set.

There are so many causes influencing the results obtained, and unfortunately in most specifications no particulars are given regarding the method in which the test will be carried out. With any sample of cement the same tester can obtain vastly varying results according to the method of manipulation, and a much wider range of results may be obtained when tested by different operators.

Some of the causes which influence the results are the character of the water, the amount of water used in gauging, the



Scale of Feet.

Congregational Church, Dover. Plan and Section.

TABLE I.

	Method of Treatment. 20 per cent. Water to Gauge in each Test.	Time Mixing.	Temperature ° F.	Setting Time.		
				Initial.		Final.
				Mins.	Hours.	Mins.
1	Mixed quickly, with no particular care	1	63	3½	—	8
2	Mixed quickly, with no particular care	1	63	6½	—	24
3	Mixed carefully; gave well-finished pat.	1½	63	8½	—	30
4	Mixed carefully; gave well-finished pat.	2½	63	10	1	43
5	Mixing needlessly prolonged and occasionally left at rest	5	62	8	—	35
6	Same as 5, but mixing all the time	5	62	13	—	38

temperature of water and air, the method of mixing, and the time taken for manipulation.

The results of experiments by the author to see what effect lengthening the time of mixing had on the setting time are given in Table I. The effect of different proportions of water is shown in Table II. The author has found that

TABLE II.

Temperature ° F.	Setting Time when Gauged with 20 per cent. of Water.			Setting Time when Gauged with 25 per cent. of Water.		
	Initial.		Final.	Initial.		Final.
	Mins.	Hours.	Mins.	Mins.	Hours.	Mins.
68	12	1	—	20	1	10
68	5	—	24	13	1	47
67	8	—	20	13	1	46
64	14	2	7	72	2	37
69	5	—	46	16	2	34
68	24	3	—	45	3	15
68	12	—	53	34	2	23
66	8	1	7	24	2	5
69	9	—	50	38	3	20
60	36	4	24	129	4	50

when the mixing with water is done in a large porcelain mortar—that is, very efficient mixing—the setting time is much longer than when mixed with a trowel. The higher the temperature the quicker will setting take place, the chemical action being more energetic.

As the setting depends on the hydration of the compounds, the cement cake must not be allowed to dry, so should be protected from currents of air and from the heat of the sun. Especially between the temperatures of 40° and 60° Fahr. is the influence of temperature seen on the setting of cement, and it is very noticeable in testing that a difference of three or four degrees has a marked effect on the setting time.

often set more quickly when gauged with sea water than when gauged with fresh water. As pointed out in a previous chapter, Candlot recognised the presence in cement of a double compound of aluminate and sulphate of lime, a compound which he prepared artificially. From this he deduced the following theory:—

"It is well known that aluminate of lime is insoluble in a saturated solution of lime. If sulphate of lime and free lime are present together with aluminate of lime it follows that the combination of the sulphate with the aluminate can take place but very slowly, because the aluminate cannot become hydrated on account of the immediate solution of the lime. In Portland cements there always exists free lime, and this lime by dissolving prevents the hydration of the aluminate; the sulphate of lime, becoming dissolved in turn and not being able to combine with the aluminate, adds its action to that of the lime in annulling the function of the aluminate, and as it is to this salt that setting is attributable when it takes place rapidly, a slow-setting cement results. If the free lime by being sufficiently exposed to air becomes carbonated, at the moment the cement comes into contact with water the lime dissolves less freely, and nothing prevents the solution of the aluminate; the combination with the sulphate of lime can take place, and the sulpho-aluminate formed, as well as the excess of aluminate, by crystallising determine the rapid setting of the cement."

Candlot found in support of this theory that—
(1) A cement mixed with gypsum and slow-setting when gauged with fresh water set quickly when gauged with a weak solution of carbonate of soda (0.2 per cent.).

(2) A cement with gypsum added, and which has become quick-setting through exposure to the air, is rendered very slow-setting by the addition of a little quantity of slaked lime.

TABLE III.

Temperature ° F.	Setting Time when Gauged with 25 per cent. Water.			Temperature ° F.	Setting Time when Gauged with 25 per cent. Water.		
	Initial.		Final.		Initial.		Final.
	Minutes.	Hours.	Minutes.		Minutes.	Hours.	Minutes.
57	15	—	50	48	34	4	—
59	12	2	—	55	17	3	30
65	26	2	10	46	55	3	—
61	46	2	—	53	110	5	—
57	30	2	—	50	50	3	50
70	18	2	10	65	60	4	55
65	5	1	30	63	9	2	10
60	135	4	43	55	213	8	—
65	50	1	47	48	122	10	—
59	21	1	13	53	43	4	10

Assuming Le Chatelier's theory of supersaturation, it is evident that the more water is added to a cement the slower will its set be, as it will take longer for the water to become saturated.

There are several compounds which, when added to cement, affect its setting. Almost the only one used in practice is sulphate of lime in the form of gypsum, which slows the setting. The German Association of Cement Makers recognise the addition of this compound up to 2 per cent.

Candlot's researches show the effect of gypsum on the setting of cement. His conclusions were:—

(1) The retardation of set caused by the addition of gypsum varies according to the quantity employed.

(2) The action of gypsum is not always permanent, and it often happens that cements slowed by the addition become quicker-setting after aging, and one peculiarity is that they

NEW HEADMASTER'S HOUSE.—In a limited competition for a new house for the headmaster, Upper Latymer Foundation, Hammersmith, the designs prepared jointly by Mr. W. I. Chambers, of Chambers and Martin (London), and Mr. J. H. Brown (Fulham), have been selected by the governors, and the contract, amounting to 1,915*l.*, has been given to Messrs. Frank Harris and Co., of Barnsbury.

EXHIBITION AT VENICE.—The Sixth International Art Exhibition at Venice, under the auspices of the Municipal Council of the City, is to be opened on April 22, 1905, to remain open till October 31 of the same year. It is to include sculpture, painting, drawing, engraving, and decorative art. Notification of the intention to exhibit must be sent not later than January 1, 1905, to the office of the Secretary of the Exhibition, Municipio di Venezia.

TRADE CATALOGUES.

We have received from the Private Wire and Telephone Installation Company, Limited of 5, Palmer-street, Westminster, a series of leaflets describing their automatic intercommunication telephone system, the "house phone," and a description of the work under taken by their electric light department. They have introduced sundry improvements in their telephone system, and it should prove useful in municipal buildings, factories, etc. To get into communication with any desired room it is only necessary to depress the key opposite the required number. The "house phone" is a cheap form of combined telephone and microphone which can be fitted with little trouble to any existing system of electric bell.

Correspondence.

THE DRAINAGE OF A HOUSE.

SIR,—In your issue of September 10, Mr. W. R. Purchase criticises, from the abstract which you were kind enough to publish, the paper on the above subject that I read at the recent Glasgow Congress of the Sanitary Institute. Before commencing his criticism Mr. Purchase is kind enough to let us know of the qualifications which he has for acting as a critic. For the past twelve years, Mr. Purchase has been acting as a building inspector to a borough council, and previous to that was connected with a pottery, where they made drain pipes, so that, although he has tested on an average three or four hundred new drains each year, a goodly part of the twelve years he mentions will have been taken up in learning his business as a building inspector, and to judge from what he has written, he has still something to learn about the drainage of a house. I have had thirty-one years' experience, as an apprentice journeyman mason, foreman, builder, manager, and clerk of works; therefore should also be expected to have some practical experience of the subject, and the parties who asked me to contribute the paper had thought that I did know something about it.

If Mr. Purchase had been present at the congress he would have heard that I did not advocate the use of freelay pipes because they were made from freelay, but that I advocated the use of pipes made from a fre clay which was found to be suited for making a strong non-porous pipe.

Mr. Purchase says that "this new advocacy of the freelay drain pipe is undoubtedly a retrograde movement." Does anyone for a moment consider that a freelay closet, substituted for a cast-iron one, is a retrograde movement? or the substitution of freelay sinks, baths, lavatories, and urinals for cast-iron fittings of that description, can that be termed a retrograde movement? If not, then why should the substitution of a freelay pipe for a cast-iron one be considered a step in a backward direction?

Mr. Purchase is kind enough to describe how the glazing of an inferior freelay pipe is effected, but I have to ask him if, in his pottery experience, he never heard of a freelay pipe lined with a fluxing "skin," and having a D.D.V. (double dipped vitrified skin) on the outside. Mr. Purchase admits that the defects to which freelay pipes are liable can be remedied if proper care be taken in the laying of them, and with the material used. I am certain that anyone who has had experience of some of the sanitary regulations in cities and towns will admit that they are far from perfect, and will agree with me when I say that they should not be quoted as an authority, as to what materials should or should not be used.

I do not think that I have proved too much by my tests; it is only a person who, like Mr. Purchase, reads a meaning into them which was not intended, or fails to grasp my line of argument, that would make that statement.

Mr. Purchase says that "hydraulic pressure is the only agent that should be used in tests," but from his I beg to differ. It is not an internal hydraulic pressure that we have to guard against in house drainage, but an internal pneumatic pressure caused by a sudden increase of temperature in the pipe resulting from such a cause as a discharge of hot water into the drains. During my tests on pipes, I found that a pipe which stood a hydraulic pressure of 60 lb. per sq. in., with out the least sign of porosity, would not stand a pneumatic pressure of 2 lb. per sq. in. From this we may infer that hydraulic test is no guide as to whether a drain is airtight or not, and that the pneumatic test is the only one that can be relied on.

COMPETITION.

Mr. Purchase had read the abstract of ordinary care he would have seen that it did not experiment on a glass lined pipe, on what is sold, and as I thought was worn to all sanitarians, as a glass enamelled pipe. I am quite aware that the majority of acids can be stored in a glass carboy, but I am not aware of any pipe fender having come the difference of expansion, when heated to heat of glass and cast iron. A cast-iron pipe could be lined with stoneware in a satisfactory manner.

Mr. Purchase says that cast-iron piped with lead can be made perfectly tight. Has Mr. Purchase ever tested old pipes, laid in this manner, which had been subjected to an intermittent flow of hot and cold water, and found them tight?

Mr. Purchase advocates the use of cast-pipes lined with porcelain enamel. In Mr. Purchase's pottery experience, I have not been found that before a satisfactory melling mixture could be fused on, a temperature, ranging from 3,000 deg. to 100 deg. Fahr. was required in the kiln. Would I ask if this temperature can be applied to a cast-iron pipe?

will not follow Mr. Purchase into the part in this article which does not deal with what is in my paper.

SAMUEL SMITH.

GENERAL BUILDING NEWS.

NEW ROMAN CATHOLIC CHURCH, HULL.—The Catholic Church of St. Patrick, in Spring-ett, Hull, was opened recently. The new edifice is in the Romanesque style of architecture, and is built of red brick with stone sills. The nave and sanctuary combined are 100 ft. long by 24 ft. wide, north and south aisles of the same length, by 12 ft. e. The nave arching and the arches to sanctuary and side chapels are of stone, with carved capitals and moulded arches. The sanctuary floor is laid with Rust's vitreous tile, the steps are of idle stone with tiled risers. Sacristies, heating chamber, etc., are provided. The communion rails are in stone, with three wrought-iron gates and polished brass rails. The church will be heated on the low-pressure system, and lighted by electricity. Accommodation is provided for 550. The contractors were Messrs. G. Jackson and Sons, of Hull, the architects being Messrs. Brodriek, Lowther, Walker, of Hull and Bridlington.

RENOVATION OF ST. PETER'S EPISCOPAL CHURCH, PETERHEAD, N.B.—This church was lately reopened after having been extensively renovated. Besides the introduction of a pipe organ, the improvements include the erection of a new porch, the formation of an entrance at the west-end of the church, an adequate choir vestry, and the repaint and cleaning of the whole of the edifice. The joiner work has been executed by Mr. Messrs Taylor, jun., and the building work by Messrs. Wm. Stuart and Son. The organ, which is in a case of pitch-pine, stained dark, with front pipes gilded in old gold, has been built by Messrs. Wadsworth Brothers, Manchester, and cost 520l. The alterations were carried out from the plans of Mr. Marshall Mackenzie, architect, of Aberdeen.

ALTERATIONS TO THE PRESBYTERIAN CHURCH, DUNDEE, NORTHERMBERLAND.—After having undergone alterations, both externally and internally, the Cheviot-street, Presbyterian Church, Dundee, was reopened on the 4th inst. The alterations consist of a new tower at the west corner in the Gothic style, with a spire in the centre, rising to a height of 70 ft. above the ground. Traceried windows have been put in, with stained glass throughout. The walls have been raised 5 ft., and battlemented. The interior of the walls have been painted, the woodwork varnished, and the seats newly upholstered. The incense burner has been introduced, and lighting conductors have been connected with the highest points. The contractors for the work were:—Builders, Messrs. H. Elliot and Co.; Berwick; joiner, Mr. T. Lumsden; slat and plastering, Mr. J. Simpson; plumbing, Mr. J. Briggs; painting and glazing, Mr. G. Jackson, all of Wooler; upholstering, Messrs. W. Skelton and Co., Edinburgh. The work has been executed from plans prepared by Mr. Revell, architect, Alwick.

NEW WESLEYAN CHURCH, POLPERRO.—The Wesleyan church at Polperro was opened recently. The new building has a total length of 55 ft., and is 35 ft. 6 in. in width. Accommodation is provided for 350 adults or mixed congregation of 450 persons. The organ and choir are placed on a raised floor in the rostrum, and there are vestries for the minister and choir. The exterior is made to open outwards on springs. The general design is late English Gothic. The walls are of stone, faced with stucco, and the roof is covered with Cornish slates. The

timber is red deal, and the joinery, pitch-pine. The timbers of the roof have curved ribs and panelled work stained dark. The windows are glazed with cathedral leaded lights, and the heating is by hot water, the ventilation being on the natural system with fresh air inlets at the sides and extractor in the roof. The cost of the work, exclusive of land, is about 1,850l. The architects are Messrs. John Wills and Sons, of Derby and London, and the building work has been carried out by the following:—Messrs. Littleton and Blatchford, masons; Messrs. T. and T. Libby, carpenters and joiners.

CONGREGATIONAL CHURCH, TOOTING.—Work is shortly to be commenced on a new Congregational church, which is to be erected in Mitcham-road, Tooting. The building will be of hard red brick, with stock sides, and stone or terra-cotta dressings. It will be heated by steam, and lighted by electricity. Seating is to be provided for 800 people, about 300 of whom will be placed in galleries. A church parlour and vestries will also be provided. The architects are Messrs. Gordon and Gunton, the contractors being Messrs. Castle and Son, Clapton. The cost will be 5,500l.

ENGLISH CONGREGATIONAL CHAPEL, CAERPHILLY, WALES.—The new English Congregational Chapel, situated in Van-road, Caerphilly, was opened a short time ago. Owing to the difficulty of the site, the chapel is built with two floors. On the lower floor, with the main entrance in Goodrich-street, are arranged a church parlour, two vestries, and four large classrooms, together with kitchen and lavatory, etc. The chapel itself will accommodate 500 people without galleries. Provision is made for galleries to be erected at a future date. The structure is built in Late Gothic style. The walls are faced on the outside with blue Pennant stone, with Bath stone dressings. The interior is treated with pitch-pine arches carried on columns. The total cost of the building is about 3,000l. It has been built by Mr. J. Howells, from the designs prepared by Mr. W. Beddoe Rees, architect, Cardiff.

MOSQUE FOR LONDON.—According to the *Daily Mail*, Mr. Robert Williams, architect, has been commissioned by a Turkish Pasha to prepare plans for the erection of a mosque to accommodate the 2,000 Mahommedans estimated to reside in London. A feature of the edifice will be a minaret, whence the muezzin will call the faithful to worship. The plans have been sent to Constantinople for the approval of the Sultan.

NEW SCHOOL, PARKHEAD, GLASGOW.—The new school erected for the Glasgow School Board at Parkhead was recently opened. The building is built of red sandstone, covered with Westmorland slates. It is lit throughout with electric light. Accommodation is provided for 1,476 scholars. Messrs Macwhannell and Rogerson, architects, Glasgow, prepared the plans for the work.

NEW SCHOOL BUILDINGS, HUNTY, N.B.—The new wing which has been added to the Gordon Schools at Huntly was opened recently. The main walls of the building are of local granite, with dressings of Elgin freestone. The structure is two stories in height. The ground floor has in the centre a hall, containing a staircase with double flights, giving access to the first floor, and having at either end separate cloak-room and lavatory accommodation for boys and girls. On the east side of the entrance hall is a range of three classrooms, each seated for sixty pupils, with dual desks. The western side of the ground floor is given to the gymnasium, which is a hall measuring 76 ft. long by 25 ft. wide and 14 ft. high, fitted up with the necessary appliances. The first floor has a hall in the middle, with board-room and headmaster's and teachers' rooms at the ends, and a range of three classrooms. The nine classrooms provide accommodation for 540 pupils, and the gymnasium for nearly 180 more. The building is heated by hot water on the low-pressure system from a furnace in the basement. Playgrounds enclosed by iron railings are provided both for boys and girls. The architect is Mr. R. G. Wilson, Aberdeen, and the following were the contractors:—Mason, Robert Mitchell, Huntly; carpenter, James McKay; Huntly; plasterer, George McKay; Huntly; plumber, John Wilson, Huntly; painter, A. Robertson, Huntly; slater, Adam and Co., Aberdeen; heating, Mackenzie and Moncur, Edinburgh.

NEW SCHOOLS, DARNALL, YORKSHIRE.—New schools have been erected in Hammerton-street, Darnall. The schools consist of two blocks of buildings, one of which is to be used as an infants' school, whilst the other will accommodate the older boys and girls. The exterior walls of both schools are of Dunsford coursed rockies. Two towers are utilised for ventilating the mixed school, and the infants' building is provided with a ventilating turret. The mixed school, which fronts Ouseburn-road, affords accommodation for 500

children. There is an assembly hall, 66 ft. by 33 ft., around which are grouped nine classrooms, each 24 ft. by 25 ft., and 18 ft. high, and each separated from the hall by sliding panels. Over sixty children can be accommodated in each classroom. The central hall has a panel dado, and the classrooms are decorated with coloured cement dados, whilst the cloak-rooms and entrances are lined with glazed bricks. The infants' school, fronting Hammerton-street, is similarly arranged. It has an assembly-hall, 46 ft. by 16 ft., with six classrooms grouped round it. There are two entrances, with cloak-rooms, as in the mixed school. Messrs. Forsdyke, of Sheffield, were the contractors, and Mr. W. G. Hale was the architect for the work.

PERMANENT WAY STORES, DARLINGTON.—On a site, closely approaching to their main line to the north, the North Eastern Railway Company are now completing, at Croft Junction, about three-quarters of a mile to the south of Darlington, a new central permanent way stores for the accommodation of all the material required by the engineering branch of the central division of the North Eastern Railway system. Six loading banks, four of which are about 720 ft. in length and the remaining two about 580 ft., have been constructed. Offices have been established for the storekeeper, and a range of buildings has been erected for use, during the meal hours, of the staffs employed on the "banks." The undertaking has been carried out by the North Eastern Company's engineering department from the designs and under the personal supervision of Mr. J. C. Valentine, the District Engineer at Darlington.

BUSINESS PREMISES, CHEAPSIDE.—New premises have been erected at the corner of Paternoster-row, in Cheapside. The buildings have been carried out in Portland stone, in the Renaissance style, the main facade being broken by three oriel windows, the angle feature at the corner of the building being an oriel supported by a life-sized Caryatide. The whole block is surmounted by a dome resting on an octagonal base. The two lower stories, which are architecturally supported by bronze plasters, have been so designed as to be available either as large retail shops or as banking or insurance premises. The general contractors were Messrs. L. Whitehead and Co., while the architectural carved work was executed by Mr. Gilbert Seale. The architect was Mr. Delissa Joseph.

TOWN HALL AND LIBRARY, BOYNESS, N.B.—The new Boyness Town Hall and Carnegie Library was opened on the 14th inst. The building occupies a site on the Glebe Park. The ground plan is of cruciform shape with double transepts, the western ones being square and the eastern ones semi-circular, while the east end of the cruciform is square and the west end in semi-circular. The structure is divided into two sections immediately to the west of the eastern transepts by dual entrances and staircases, and by a common vestibule, which gives access to both sections of the building. The eastern section is devoted to the public library, and the western section to the town hall, which is equal in height to the two floors of the library, consists of area and gallery for the audience, and large platform for speakers or performers, and retiring-rooms for principals, chorus, and orchestra. The area is seated for 700 adults, and the gallery is seated for 390 adults on fixed benches, together seating accommodation for 1,099 persons, exclusive of the platform. The estimated cost of the buildings is 12,000l. The architect was Mr. G. Washington Browne, of Edinburgh.

NEW BUILDINGS IN SUNDERLAND.—At the meeting of the Sunderland Building Committee held on the 5th inst., fifty-four plans were under consideration. Amongst those approved were plans prepared by Messrs. Henderson and Hall for the River Wear Commissioners' offices, which are to be erected on a site at the corner of John-street and St. Thomas's-street.

VARIETY THEATRE, GATESHEAD.—Work is shortly to be commenced on the new Alhambra Theatre at Gateshead. The work is to be carried out by Mr. James Janson, contractor, Boldon, from the plans of Mr. Stuart S. Mould, architect.

FREE LIBRARY, PENARTH.—The foundation-stone of the new free library at Penarth was laid on the 10th inst. The building will be of the Elizabethan style, faced with Penarth stone, with Bath stone dressings. In the basement will be a boys' reading-room, 40 ft. by 18 ft., with lavatory accommodation, a stove, and heating apparatus. On the ground floor will be a hall and lending library, about 40 ft. square, with librarian's room, also a reading-room, 44 ft. long, and an average width of 23 ft. On the first floor will be a ladies' reading-room, 36 ft. in length, and an average width of 17 ft., and a reference library, 30 ft. by 18 ft. The Penarth District

Council have also under consideration a proposal to erect a caretaker's house at the far end of the library. The contractor is Mr. Fred. Bond, Cardiff, and the architect Mr. H. Snell, Penarth.

PUBLIC HALL, DARNALL, YORKSHIRE.—A site has been secured in Barnadistone-street, Darnall, for the erection of a public hall. The proposed building will be over 100 ft. long by 42 ft. frontage, and will hold 600 to 700 people. It will be provided with meeting-hall, committee-room, ladies' and gentlemen's cloak-rooms fitted with lavatories, and kitchen. The structure will be heated and lighted throughout. There will be a stage at one end of the hall, and a musicians' gallery at the other. Mr. A. C. Turnbull, architect, has prepared the plans for the work.

BANK PREMISES, SOUTH SHIELDS.—A new branch office of the York City and County Bank has been erected in Fowler-street, South Shields. The building is in the late Renaissance style. It has a granite base up to the window-sill level; the remainder of the ground floor is built in coursed ashlar, and the walls above are faced with thin Commendale bricks, with stone dressings. The principal entrance, situated at the corner of Denmark and Fowler streets, is under a heavy arched stone canopy, which carries a circular angle bay finished with a low turret roof. On the ground floor is the banking-room, panelled in mahogany to a height of 9 ft., the ceiling being of panelled plaster. Adjoining are the manager's room, safe-room, strong-room, and latrines. The first floor consists of a suite of offices with the entrance from Denmark-street, while the caretaker's rooms are situated on the second floor. The premises have been erected by Messrs. W. J. Robertson and Sons, South Shields, from plans prepared by Messrs. Clark and Moscrop, of Darlington.

NEW THEATRE, GLASGOW.—The new "King's Theatre," situated at the corner of Bath-street and Elmbank-street, Glasgow, was opened on the 12th inst. The outer walls of the building are of Lochbarriggs stone from Dumfriesshire, while the interior is decorated in marble, tile work, and fibrous plaster. Seating accommodation is provided for about 2,000 persons. The lower floor contains the pit and orchestra stalls, accommodating about 700 of the audience, and on the same floor are a scene dock, artistes' dressing-room, etc., manager's offices, refreshment saloon for the pit, and pay-boxes at each of the various entrances. The second floor includes the dress circle, seated for about 300, with two private boxes on each side, the foyer, crush-room, grand staircase, and saloon for the dress circle and stalls, with additional dressing-rooms for artistes. On the third floor the upper circle has seating accommodation for over 300 persons, and there are two private boxes, one on each side of the proscenium opening, also a saloon, artistes' dressing-rooms, etc. The fourth floor consists of the gallery, to accommodate 700, a saloon, and various small rooms. On each floor are cloak-rooms and lavatories. There are separate staircases to every floor. The principal entrances are from Bath-street, while from Elmbank-street are two entrances to the pit and two to the gallery. The contractors were Messrs. Morrison and Mason, and the architect was Mr. Frank Matcham. The cost has been about 50,000.

NEW COUNCIL OFFICES, HINDLEY, LANCASHIRE.—The new public offices which have been erected by the Hindley Urban District Council were opened recently. The premises are three stories in height. The ground floor contains offices for clerk, assistant clerk, collector, assistant collector, medical officer, overseer's and school attendances officer's rooms, and waiting-rooms. The first floor contains council chamber, committee-room, chairman's parlour, surveyor's drawing office, private office, and plan-room, and a spare room. The attic contains rooms for the caretaker, and the basement contains nuisance inspector's office, pay office, and men's waiting-room, heating apparatus, and rooms for future offices or store-rooms. There is a front or side entrance from Wigan-road, and also an entrance from Cross-street. The elevations are built of red pressed bricks, with Yorkshire stone dressings. The contractor for the building was Mr. D. A. Ablett, of Wigan, and the work has been carried out under the supervision of the architects, Messrs. Heaton, Ralph, and Heaton, of Wigan. The total cost of the building, including furnishing, etc., was 7,318.

TENEMENT BUILDINGS, DUNDEE.—Tenement properties are being erected in Blackness-avenue, Dundee. The buildings, which are being put up by a syndicate, will consist of four four-roomed houses, twenty-four three-roomed houses, and four two-roomed houses. All the houses will have oriel windows, and will be lit by electricity. The following contractors have been selected:—Mason work, Messrs. James Binny and Co.; joiner work, Messrs. W. and R. Brownlee; plumber work, Mr.

David Brown. The other contracts have not yet been settled. For the same syndicate six blocks of superior tenement property have been erected at Baxter Park-terrace. The tenements are erected on the west side of the park, and consist of forty-eight houses of three and two rooms. Four of the tenements are composed of three rooms and two rooms, the three rooms having baths and hot and cold water, and the two rooms hot and cold water, sculleries, and lavatories. Two of the tenements consist of two-roomed houses, with baths, lavatories, hot and cold water, etc. The baths in the houses are vitreous enamelled American baths, and are open. The contractors were:—Mason work, Messrs. James Binny and Co.; joiner, Messrs. W. and R. Brownlee; plumber, Mr. David Brown; painters, Messrs. James Mackay and Son; plasterers, Messrs. Reoch and Kilgour; grates, gasaliers, etc., Messrs. G. H. Nicoll and Co. Mr. James Sibbald, architect, designed both properties.

DISTILLERY EXTENSIONS, BADENOCH, N.B.—Contracts are about to be accepted for additions to and improvements on the main building of the Dalwhinnie Distillery, as well as for the erection of more workmen's dwellings, and for the introduction of an additional supply of water by gravitation. It is estimated that the contemplated outlay will amount to some 2,000, or 3,000. Mr. A. Mackenzie, C.E., Kingussie, is the architect for the new works.

NEW LIBRARY, GLASGOW.—The Kingston District Library was opened on the 8th inst. The building occupies a site in Paisley-road, and includes, besides the library, a series of public halls and the district police office. The front elevation is of red stone. A corridor leads to the library, which is in the rear of the main building, and is two stories in height. On the ground floor are the lending department, the general reading-room, and a reading-room for boys and girls. The designs for the work were prepared in the City Architect's department, under the supervision of Mr. McDonald, by Mr. Horn.

NEW ISOLATION HOSPITAL, LANCASTER.—A new isolation hospital for men and fever block are to be erected at Lancaster County Asylum. The plans for the work have been prepared by Messrs. Willink and Thicknesse, architects, Liverpool, and the tender of Messrs. J. Hutch and Sons, Lancaster, which amounts to about 22,000, has been accepted.

SANITARY AND ENGINEERING NEWS

MONTROSE WATER SUPPLY.—The Montrose Town Council have recently had under consideration a report from Messrs. Henderson, of Glasgow, in regard to the water supply. During June there was a scarcity of water at Kinnaber, and it was considered whether the supply could be supplemented by an artesian well. Messrs. Henderson stated that if the bore was put down where they indicated the chances were in favour of tapping a large supply of water. Not only would the bore act as a test power for proving the quality of water, but would at the same time be sufficiently large to be of practical purpose. The subject was adjourned for further consideration.

FOREIGN

FRANCE.—The Paris Municipality has caused to be erected at Pere Lachaise a monument to the memory of workers who died in the service of the City of Paris. This monument, which was designed by the late M. Dupré, the architect, consists of an obelisk, by which stands a veiled figure of a woman depositing a crown; the figure is by M. Denys Puech.—M. Bernstamm, the sculptor, has completed the model for a monument to Paileron, the author of so many well-known plays. It will be erected in the Parc Monceau, and consists of a stele supporting the bust of Paileron, before whom a female figure lays a garland of flowers; this figure is supposed to be a portrait of Jeanne Samary, who, at the Théâtre Français, was one of the principal interpreters of the works of Paileron.—A monument to the memory of Daubigny, the landscape painter, has been erected by public subscription at Anvers-sur-Oise.—There has been some new destruction among the ancient monuments of Avignon. This time, however, the offenders are not the municipal authorities, but the military engineers, who have destroyed the ancient cloister of the convent of the Celestins, which had in recent times been used as a military prison.—The Société Archéologique of the South of France has succeeded in saving from destruction the XIIIth century gateway enclosed in the fortifications of the picturesque town of Cordes, founded by the Counts of Toulouse.—A steel bridge is to be built over the Rance between Port Jean and Port St. Hubert, near Dinan.—A Presidential decree has been issued

authorising the establishment of a local school of architecture at Rouen.—The death is announced at the age of seventy-eight, of a distinguished collector, M. Emile Peyre, who has left a splendid collection of medieval and Renaissance furniture and woodcarving is valued at 1 million francs. It is said that this remarkable collection has been left as a legacy to the Musée des Arts Décoratifs.

ALGERIAN ONYX MARBLES.—Mr. Scratchley, British Vice-Consul at Philippeville, reports that the onyx quarries at Ain Smava are at the present time worked. This industry, he says, suffers principally from the cost of labour, the difficulty of finding skilled marble workers. The competition with marbles imported from Europe renders it difficult to develop the quarries as one could wish. The onyx marbles from Ain Smava, which are the hands of a house at Marseilles, are sent to France to be dressed, and come back to the place of origin if required. It is easy to understand that, under these conditions, builders prefer buying marbles ready dressed from Europe; yet, as regards quality a beauty, nothing can be finer than some of the onyx. The quarries cover 7,500 acres, and the beds are very thick, varying in width from 6 ft. to 55 ft. The following are the principal qualities found:—Golden, with a seam, 33 1/2 wide; cloudy, 13 ft.; African breccia, 13 ft.; red African 10 ft.; red agath, 10 ft.; dark, 10 ft.; 8 in.; Jasper agath, 7 ft.; onyx, 5 ft.; rose agath, 3 ft. The five to six seams can produce columns from 12 ft. to 15 ft. in length, which is very rare in onyx marbles. Eight of these monolithic columns have been prepared at Marseilles for the Roman Catholic Cathedral at Westminster, which they are now in doubt in position, as others are in preparation. If they are anything like the onyx employed at the Tower Hall of Constantine, they are, says Mr. Scratchley, worth the trouble of going to sea. An order from America for columns of 33 1/2 to 39 ft. in length was received, but the difficulty is to get blocks of this size down to the sea. The very heavy railway rates also against profitable operations.

GRANITE INDUSTRY IN BRITISH INDIA.—According to a statement in the *Indian Review* a new industry has recently been developed among the granite quarries of Palovaram, in the Madras Presidency, viz. the manufacture of granite pillars, colonnades, etc., and stone sets for paving streets and for houses. The enterprise, although yet in its infancy, is already employing over a thousand native artisans, all the cutting and polishing being done by hand, without the aid of a machinery.

MISCELLANEOUS

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. W. B. Wilkinson and Co., fire-proof floor specialists, concrete paviors, and artificial stone manufacturers, of London and Newcastle, are removing their London business from 1, Victoria-street to new offices at works which they have erected at the junction of Townmead-road and Imperial-road, Fulham, close to the river and to the Chelsea gas station.

EAST LONDON CHARITIES.—The administration of the local Henderson Charity, founded for the benefit of the parishioners of St. George-in-the-East, will shortly be remodelled in terms of a scheme framed by the Charity Commissioners to alter their scheme made eleven years ago so as to empower the trustees to grant pensions of from 10s. to 12s. a week jointly to married couples, with a pension of from 7s. to 10s. a week to the survivor in each instance. The Borough Council are about to add the site of the old engine-house, which has lately been assigned as a residence to aged parishioners, to the burial ground in Hackney-road, in which it stands, and to erect, in its stead, a new home in Nightingale-road, Wood Green, where the Shore-ditch Charity Trustees have recently built some almshouses. The latter buildings supplied three elderly St. Luke's, which were founded in the latter half of the XVIIth century, and of which the site was purchased from the trustees for the new police-station.

NORWEGIAN TIMBER TRADE.—It is reported officially that the export of timber from Norway in 1903 was nearly 9 per cent. more than in 1902, and, as prices were generally good, the timber industry brought to the country between 600,000 and 700,000, more than in any year before. The following table gives the total export of timber for the last three years:—Planned timber, 1903, 665,079 cubic metres; 1902, 598,568 cubic metres; 1901, 565,741 cubic metres. Sawn timber, 1903, 585,561 cubic metres; 1902, 536,174 cubic metres; 1901, 468,847 cubic metres. Hewn timber, 1903, 118,416 cubic metres; 1902, 105,696 cubic metres; 1901, 67,937 cubic metres. Round timber, 1903, 572,003 cubic metres; 1902,

375 cubic metres; 1901, 510,940 cubic metres. Staves, 1903, 88,394 cubic metres; 2, 85,506 cubic metres; 1901, 91,760 cubic metres. Laths, 1903, 102,867 cubic metres; 2, 93,416 cubic metres; 1901, 99,999 cubic metres. From Christiania about the quantity worked was 222,502 cubic metres, compared with 202,472 cubic metres in 1902, and 200,792 cubic metres in 1901. The principal exporting trades of timber unworked or half-worked are Sweden, Christiania, Drammen, Fredrikshald, Porsgrund, Christiansand, Larvik, Sandnessjøen, and Arendal; and of worked timber, Drammen, Christiania, Skiens, Sarpsborg, Porsgrund, Arendal, and Fredrikshald. The bulk of the timber worked and unworked in 1902 to the value of 2,096,033—goes to the United Kingdom; and France, Belgium, Germany, the Netherlands, and Denmark are the next largest consumers. The Vice-Consul Fredrikstad, one of the chief centres of this industry, reports that business has been good, and, on the whole, profitable, whilst a good trade was maintained with the Cape. From the west coast of Norway there was a good market in 1903 for almost all sizes, but, notwithstanding the good selling prices, the trade in sawn timber is reported as not giving a return, owing to the very high prices for the last years. It is probable that, owing to the mills having had to pay higher prices for their log supply for the current year, prices will still continue to be high.

CHURCH OF ST. ANDREW, HOXTON.—Dr. Stram, K.C., Chancellor of the Diocese of London, has granted a faculty for the carrying out of some improvements and repairs of the church of St. Andrew. The new works will consist of an estimated cost of 1,000*l.*, the removal of the west gallery and stairs, a porch in gable at the west door, a choir vestry with an gallery, and a rearrangement of the organ chamber, choir seats, and desks so as to provide for a total of 570 sittings. The church is built in Canal-road, Hoxton, in 1864-5, and the plans and designs by Mr. C. A. Long, in the Early English style, the organ being by Hollichs.

PICTURE POST-CARDS OF BATH.—Messrs. B. J. F. Meehan, of Bath, send us a set of picture post-cards of "Old Bath," reproduced from drawings by David Cox. These are some of the notable buildings of Bath, accompanied by figures in the costume of the period when Bath was a centre of fashion. They are interesting and well produced.

VICTORIA HISTORY OF THE COUNTIES OF ENGLAND.—The resignation is announced of Mr. H. A. Doubleday as joint editor with William Page, member of the Council of the Society of Antiquaries, of the Victoria County History. Mr. Page had been appointed general editor of the series of volumes which are issued from time to time, and form most valuable complement to the existing standard county histories.

THE OLD INN, HIGHGATE.—The Old Red Inn at Highgate has just been pulled down. It had been a famous hostelry in its day, being frequented by travellers on the road at North-road, and by graziers and cattlemen on the last stage of their journey with their cattle to the market in West Smithfield. It was also one of the many inns at one time in London in number—where was observed the early ribald custom of "swearing on the inn," for which were used a pair of either stag's or stag's horns mounted upon a staff. *Hone's Every Day Book*, vol. ii., 1841, will find an illustration after a woodcut by George Cruikshank of the ceremony at the inn, and Crown, on Highgate-hill, with a description of its observance, which says that the usage first obtained, it seems, at the old inn-house, whither, in the XVIIIth century, thousands of quality would ride from town to be entertained and so made free of Highgate. The gatehouse, which stood across the road at the entrance into the forest, where tolls were received for the Bishops of London, was pulled down in 1769, and replaced with a turnpike gate. Dwelling houses are to be built on the site of the inn.

NEW PUBLIC BATHS.—Messrs. W. E. Dole and Co. ask us to mention that skylights in the building (illustrated in our last issue) are glazed on their patent "Invincible" system.

THE LARGEST GRAVING DOCK IN ASIA.—Exploring the new Colombo Harbour Extension Works, Mr. A. R. Slater, the Assistant Secretary of Ceylon, states that they are making good progress. The amount spent during the year 1903 was nearly Rs. 3,000,000, giving the total expenditure on the present works up to Rs. 15,426,575, the grand total expenditure since the commencement of the west breakwater in 1875 having been 31,042,771. The new breakwaters are now advanced towards completion, and it became necessary in 1903 to decide the question of the width of the entrance to the harbour between the old or south-west breakwater

and the island or north-west breakwater. After full consideration the width was fixed at 800 ft., with the concurrence of the consulting engineers, the admiral, and the Harbour Board. The narrower entrance appears to be convenient for navigation, but it is considered that a width of 800 ft. will be sufficient for the largest steamers to enter the harbour. It is anticipated that the new graving dock will be open in 1906. The original estimate of cost was Rs. 5,218,390, and the Admiralty and the colony agreed to provide this amount in equal shares. Subsequently, however, it was decided to increase the length of the dock from 500 ft. to 700 ft., and as the Admiralty were unable to increase their contribution the whole additional cost—23,700*l.*—is being borne by the colony. The dock, when completed, will be the finest and largest in Asia, and, indeed, will probably challenge comparison with any of the dry docks available for the use of His Majesty's Navy. The Merewether dry dock at Bombay, the No. 1 dry dock at Hong Kong, and the dry dock No. 3, now under construction at Singapore, are 500 ft. long on the floor, or 200 ft. shorter than the Colombo graving dock, while, although the docks under construction at Gibraltar and Malta are to have lengths of 850 ft. and 750 ft. respectively, it must be remembered that they are really double docks. The depth over all the Ceylon dock at high water will be 32 ft., which also compares favourably with the depths of the docks at Bombay, Singapore, and Hong Kong. The breadth of the graving dock will be 85 ft. at the entrance. The longest ships in the Navy—the *Good Hope* class—are 500 ft. long; the broadest—the *King Edward* class—78 ft. long, while none draw more than 27½ ft. The Colombo dock will therefore easily accommodate the longest and largest British war vessels for many years to come. As regards merchant ships it will take anything afloat, with the exception of the new boats on the Atlantic line, but none of these is ever likely to be seen at Colombo.

NATIONAL ASSOCIATION OF HOUSE PAINTERS.—The eleventh Annual Convention of the National Association of Master House Painters and Decorators of England and Wales will be held in Manchester next week, the proceedings commencing on Monday. An exhibition of manufacturers and of apprentices' competition and international studentship competition drawings will be opened in St. James's Hall, Oxford-street. On the evening of the 19th the President of the Association (Councillor James Higson, of Salford) will hold a reception in the hall. Mr. J. D. Crace, President of the Institute of British Decorators; and Mr. R. Glazier, Head Master of the Manchester Municipal School of Art, will deliver addresses on special subjects, and various papers will be read by others. The annual dinner is fixed for the Wednesday evening, at the Midland Hotel.

A FLAME-PREVENTING FLUID.—The Snowdon's Flame-Preventers Company send us a sample of their fluid for rendering substances which have been steeped in it (according to directions given on the label) non-flammable. Some articles sent to the new specimens which had been treated by the fluid, fully bear out what is claimed for it. Bits of wood which had been steeped in it entirely refused to burn; and some pieces of light textiles, which would ordinarily have burnt up in a moment when held over a flame, merely blackened. The manufacturers claim that with this chemical compound, the invention of Mr. F. Seaton Snowdon, and to which they have given the name of "Snowdon's Preventer," it is possible to render every variety of flannel, cotton and woollen goods, silks, satins, laces, curtains, muslins, bed-hangings, ladies' and children's clothing, matting, paper, wood of every description, and, in short, every inflammable substance, absolutely flame-proof. The tests we have been able to make seem quite to bear out the claim.

LOCAL GOVERNMENT BOARD INQUIRY AT BOOTLE (LANCASHIRE).—Mr. H. P. Boulnois, C.E., an Inspector under the Local Government Board, held an inquiry on the 8th inst. at the Bootle Town Hall with reference to the applications of the Council for the following loans:—940*l.* for public conveniences, 4,600*l.*, widening Linacre-lane Canal bridge, 3,000*l.*, construction North Docks subway. The Town Clerk explained that the 940*l.* was required for the erection of three conveniences in three places in the borough—viz., Stanley-road Canal bridge, Coffee-house bridge, and Irlam-road. The conveniences would be placed in the main thoroughfares. The estimated cost of each place would be—Stanley-road, 600*l.*; Coffee-house Bridge, 210*l.*; Irlam-road, 130*l.*; total, 940*l.* The Town Clerk, proceeding to the next application, said the sum of 4,600*l.* was required for the construction of a new bridge over the Leeds and Liverpool Canal in Linacre-lane. The neighbourhood was rapidly developing, and Linacre-

lane was one of the main outlets for traffic from the north end of Bootle. He thought there could be no doubt that in years to come the lane would be one of the principal arteries for traffic in that neighbourhood. The old bridge still remained, and was a great obstacle to traffic. It was only 10 ft. wide, and had a span of only 24 ft. The whole of the widening of the road had been completed with the exception of the bridge in question, and what was proposed to do now was to pull down the old bridge and erect a new one with a width of 72 ft., with improved levels, which gave easy gradients on both sides of the bridge. The sum of 3,000*l.* was required for the construction of a subway under the North Mersey goods yard of the Lancashire and Yorkshire Railway and leading to the North Docks. The execution of the work had already been sanctioned by an Act of Parliament. The subway would be 83 yds. in length, 6 ft. wide, and would be illuminated and drained. The Town Clerk admitted the difficulties that stood in the way of patrolling the subway if it was kept open all through the night. The Inspector said he thought it was a great risk for the Corporation to take in regard to the matter. The Town Clerk said he could only admit the difficulty, and it was proper that the Local Government Board should know of it. Subsequently Mr. Boulnois proceeded to inspect the several localities mentioned.

WAR MEMORIAL, RHYL.—The memorial erected by public subscription to the soldiers from Rhyll who fell during the late South African War was unveiled on the 5th inst. The memorial consists of a base of two steps of Yorkstone, a pedestal of Kenmay fine-aid Scotch granite, on which is the inscription, in leaded letters, the whole being surmounted by the figure in Carrara marble of a soldier, representing the Royal Welsh Fusiliers, with reversed arms. It was designed and executed by Mr. C. Chatham, sculptor, Rhyll.

CAPITAL AND LABOUR.

JOINERS' STRIKE, NEWCASTLE.—A dispute has arisen between the joiners employed in connexion with the erection of the new infirmary and the Building Committee, which has had the effect of causing the joiners to come out on strike. It appears that the grievance is not with the contractors, but solely with the Building Committee, who, it is stated, have given part of the joiners' work to cabinet-makers, and because of this alleged encroachment the joiners ceased work.—*Newcastle Daily Chronicle*.

Legal.

CASE UNDER THE LONDON BUILDING ACT.

WHAT IS A "BUILDING"?
In the South-Western Police Court, before Mr. Lane, K.C., on Monday last, Mr. Lawton, District Surveyor for West Wandsworth, summoned Mr. Peter Bleines, of Garrat-lane, for erecting a one-story stable at the corner of Wilna-road and Farlton-road without having previously given two clear days' notice, under section 145 of the above Act. Mr. Hanne, solicitor, appeared for the defence.

It appeared that in January last the defendant inquired of the surveyor the height to which he could raise the fence walls, as he wished to protect the windows of his property from the roughs of the neighbourhood, and the defendant was informed that by section 201 he could raise the said walls to a height of 7 ft., but that no building could be erected against the walls, as, owing to the position, a building would be illegal. The surveyor watched the premises, and discovered that quite recently a building had been erected 18 ft. long, 10 ft. wide, and 7 ft. high, and used as a stable. The surveyor then gave the defendant the option of taking down the building, but the latter declined, whereupon the surveyor intimated that he should first take out a summons for neglect as to notice, and then proceed as to irregularities.

It further appeared that the building was not wholly dependent for its support from the surrounding walls, some uprights and cross-timbers having been fixed to carry the corrugated iron roof, and the defence appeared to disregard the existence of the walls in relation to the building.

Mr. Hanne to the surveyor: Do you say that a notice must be given for a greenhouse? The surveyor: Not if the greenhouse is detached from other buildings.

Mr. Hanne: We are not treated in the Act to a definition of a building.

The surveyor: No. Mr. Hanne: What is your definition of a building?

MEETINGS.

SATURDAY, SEPTEMBER 17.
Architectural Association.—Week-end visit to Kettering district.
General Purposes and Finance Committee, 3 p.m.
Architectural Association.—Visit to Consett Works, 3 p.m.
Promises, 3 p.m.
Sanitary Engineers.—Visit to Reading works. Reading Station 2.30.

MONDAY, SEPTEMBER 19.

National Association of House Painters and Decorators.—Opening meeting of annual convention, St. James's Manchester.

WEDNESDAY, SEPTEMBER 21.

Institute of Sanitary Engineers.—Meeting of Election Committee, 3 p.m.; General Purposes and Finance Committee, 5 p.m.
Opening Seasonal Meeting. Paper "Disposal of Sewage for Mansions and Country Houses," by Mr. A. S. Goodridge.
Institution of Builders' Foremen and Clerks.—Ordinary Meeting, 8 p.m.

SATURDAY, SEPTEMBER 24.

Incorporated Association of Municipal and County Engineers.—District Meeting at Withington, near Manchester.

TO CORRESPONDENTS.

THE.—The responsibility of signed articles, letters, papers read at meetings rests, of course, with the authors.
We cannot undertake to return rejected communications, and the Editor cannot be responsible for forgery, manuscripts, or other documents, sent to or at this office, unless he has specially asked for them.
Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT REEDED.
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We commission to a contributor to write an article, execute or lend a drawing for publication, is given only on the approval of the article or drawing, when sent, by the Editor, who retains the right to reject unsatisfactory. The receipt by the author of a copy of an article in type does not necessarily imply its acceptance.
Communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, 4, Abchurch Lane, London, E.C. 4.

PRICES CURRENT OF MATERIALS.

Our aim in this list is to give, as far as possible, the true prices of materials, not necessarily the lowest, and quantity obviously affect prices—a fact which should be remembered by those who make use of our information.

Table listing various materials and their prices. Includes sections for BRICKS, &c., SLATES, TILES, and WOOD. Prices are listed in £ s. d. format.

BRICKS, &c.—(continued).
Thames and Pit Sand, 7 3 per yard, delivered.
Thames Ballast, 6 0 "
Best Portland Cement, 30 0 per ton, "
Best Ground Blue Lias Lime 21 0 " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime, 12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

BATH STONE—delivered on road wagon, s. d.
Bathons, Paddington Depot, 1 6 1/2 per ft. cube.
Do. do. delivered on road waggon, "
Nine Elms Depot, 1 8 1/2 " "

ANCASTER IN BLOCKS, s. d.
Beck, 1 6 " "
Greenhill, 1 10 " "
Barley Dale in blocks, 2 4 " "
Red Corsehill, 2 5 " "
Closeburn Red Freestone, 2 0 " "
Red Mansfield, 2 4 " "

YORK STONE—Robin Hood Quality.
Scrapped random blocks 2 10 "
6 in. sawn two sides landings to sizes (under 40 ft. super), 2 3 per ft. super. "
6 in. rubbed two sides, Nine Elms depot, 2 6 " "
ditto, ditto, 2 6 " "
3 in. sawn two sides slabs (random sizes) 0 11 1/2 " "
2 in. to 2 1/2 in. sawn one side slabs (random sizes), 0 7 1/2 " "
1 1/2 in. to 2 in. ditto, ditto 0 6 " "

HARR YORNS—
Scrapped random blocks 3 0 per ft. cube,
6 in. sawn two sides, landings to sizes (under 40 ft. super), 2 8 per ft. super. "
6 in. rubbed two sides, ditto, 3 0 " "
3 in. sawn two sides (slabs random sizes) 1 2 " "
3 in. self-faced random slabs, 0 5 " "
Hopton Wood (Hard Bed) in blocks 2 3 per ft. cube, deld. rly. depot.
" " " 6 in. sawn both sides landings 2 7 per ft. super, deld. rly. depot.
" " " 3 in. do. 1 2 1/2 " "

SLATES.

20 x 10 best blue Bangor 13 2 6 per 1000 of 1200 at r. d.
20 x 12 " " 13 17 6 " "
20 x 10 first quality " 13 0 " "
20 x 12 " " 13 15 0 " "
16 x 8 " " 7 5 0 " "
20 x 10 best blue Portmadoc " 12 12 6 " "
16 x 8 " " 6 12 6 " "
20 x 10 best Eureka unfading green " 15 17 6 " "
20 x 12 " " 13 7 6 " "
18 x 10 " " 13 5 0 " "
16 x 8 " " 10 5 0 " "
20 x 10 permanent green 11 12 6 " "
18 x 10 " " 9 12 6 " "
16 x 8 " " 6 12 6 " "

TILES.

Best plain red roofing tiles, 42 0 per 1000 at rly. depot.
Hip and Valley tiles, 3 7 per doz. "
Best Broseley tiles, 50 0 per 1000 "
Do. Ornamental tiles, 52 6 " "
Hip and Valley tiles, 4 0 per doz. "
Best Eubon red, brown, or brindled do. (Edwards), 57 6 per 1000 "
Do. Ornamental do., 69 0 " "
Hip tiles, 4 0 per doz. "
Valley tiles, 3 0 " "
Best Red or Mottled Staffordshire do. (Peakes), 51 9 per 1000 "
Do. Ornamental do., 54 6 " "
Hip tiles, 4 1 per doz. "
Valley tiles, 3 8 " "
Best "Rosemary" brand plain tiles, 48 0 per 1000 "
Best Ornamental tiles, 50 0 " "
Hip tiles, 4 0 per doz. "
Valley tiles, 3 8 " "
Best "Hartshill" brand plain tiles, sand faced, 50 0 per 1000 "
Do. pressed, 47 6 " "
Do. Ornamental do., 50 0 " "
Hip tiles, 4 0 per doz. "
Valley tiles, 3 6 " "

WOOD.

Deals: best 3 in. by 11 in. and 4 in. £ s. d.
by 9 in. and 11 in. 15 10 0 16 10 0
Deals: best 3 by 4, 14 10 0 15 10 0
Battens: best 2 1/2 in. by 7 in. and 3 in. by 7 in. and 8 in. 11 10 0 12 10 0
Battens: best 2 1/2 by 6 and 3 by 6, 0 10 0 less than 7 in. and 8 in.
Deals: seconds, 1 0 0 less than best
Battens: seconds, 0 10 0 "
2 in. by 4 in. and 2 in. by 6 in., 9 0 0 " 9 10 0
2 in. by 4 1/2 in. and 2 in. by 5 in., 8 10 0 " 9 10 0

WOOD (continued). At per standard.
Foreign Sawm Boards—
1 in. and 1 1/4 in. by 7 in. 0 10 0 more than battens.
3 in. 1 0 0 "
At per load of 50 ft.

Fir timber: best middling Danzig or Memel (average specification) 4 10 0 5 0 0
Seconds 4 5 0 4 10 0
Small timber (8 in. to 10 in.) 3 12 6 3 15 0
Small timber (6 in. to 8 in.) 3 0 0 3 10 0
Swedish balks 2 15 0 3 0 0
Pitch-pine timber (30 ft. average) 3 5 0 3 15 0

JOINERS' WOOD.

White Sea: first yellow deals,
3 in. by 11 in. 23 0 0 24 0 0
3 in. by 9 in. 21 0 0 22 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 17 0 0 18 10 0
Second yellow deals, 3 in. by 11 in. 18 10 0 20 0 0
" 3 in. by 9 in. 17 10 0 19 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 13 10 0 14 10 0
Third yellow deals, 3 in. by 11 in. 15 10 0 16 10 0
Battens, 2 1/2 in. and 3 in. by 7 in. 11 10 0 12 10 0
Petersburg: first yellow deals,
3 in. by 11 in. 21 0 0 22 10 0
Do. 3 in. by 9 in. 18 0 0 19 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 13 10 0 15 0 0
Second yellow deals, 3 in. by 11 in. 16 0 0 17 0 0
Do. 3 in. by 9 in. 14 10 0 15 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 11 0 0 12 10 0
Third yellow deals, 3 in. by 11 in. 13 10 0 14 0 0
Do. 3 in. by 9 in. 12 0 0 13 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 10 0 0 11 0 0

White Sea and Petersburg—
First white deals, 3 in. by 11 in. 14 10 0 15 10 0
" 3 in. by 9 in. 13 10 0 14 10 0
Battens, 2 1/2 in. and 3 in. by 7 in. 11 0 0 12 0 0
Second white deals, 3 in. by 11 in. 13 10 0 14 10 0
" 3 in. by 9 in. 12 10 0 13 10 0
" battens, 2 1/2 in. and 3 in. by 7 in. 9 10 0 10 10 0
Pitch-pine: deals, 13 10 0 14 0 0
Under 2 in. thick extra, 0 10 0 1 0 0
Yellow Pine—First, regular sizes 40 0 0 upwards.
Oddments, 28 0 0 "
Seconds, regular sizes, 30 0 0 "
Yellow Pine oddments, 25 0 0 "
Kauri Pine—Planks, per ft. cube, 0 3 6 0 5 0
Danzig and Stettin Oak Logs—
Large, per ft. cube, 0 2 6 0 3 6
Small, 0 2 3 0 2 6
Wainscot Oak Logs, per ft. cube, 0 5 0 0 5 6
Dry Wainscot Oak, per ft. sup. as inch, 0 0 8 0 0 9
3 in. do. do., 0 0 7 "
Dry Mahogany—Honduras, Tussah, per ft. super, as inch, 0 0 9 0 1 0
Selected, Figury, per ft. sup. as inch, 0 1 6 0 2 6
Dry Walnut, American, per ft. sup. as inch, 0 0 10 0 0 10
Teak, per load, 17 0 0 21 0 0
American Whitewood Planks, per ft. cube, 0 4 0 "
Prepared Flooring— Per square.
1 in. by 7 in. yellow, planed and shot, 0 13 6 0 17 6
1 in. by 7 in. yellow, planed and matched, 0 14 0 0 18 0
1 1/2 in. by 7 in. yellow, planed and matched, 0 16 0 0 1 0 0
1 in. by 7 in. white, planed and shot, 0 12 0 0 0 14 6
1 in. by 7 in. white, planed and matched, 0 12 6 0 0 15 0
1 1/2 in. by 7 in. white, planed and matched, 0 15 0 0 0 16 6
3 in. by 7 in. yellow, matched and beaded or V-jointed brds., 0 11 0 0 0 13 6
1 in. by 7 in. do. do., 0 14 0 0 0 18 0
3 in. by 7 in. white do. do., 0 10 0 0 0 11 6
1 in. by 7 in. do. do. do., 0 11 6 0 0 13 6
6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

In London, or delivered Railway Vans, per ton.
Rolled Steel Joists, ordinary £ s. d. £ s. d.
sections 5 5 0 " 7 5 0
Compound Girders, ordinary sections 8 2 6 " 9 5 0
Angles, Tees and Channels, ordinary sections 7 17 6 " 8 17 0
Fitch Plates 3 5 0 " 8 15 0
Cast Iron Columns and Stanchions including ordinary patterns 7 2 6 " 8 5 0

METALS.

Per ton, in London.
Iron—
Common Bars £ s. d. £ s. d.
Staffordshire Crown Bars, good merchant quality, 7 15 0 " 8 5 0
Staffordshire " Marked Bars " 10 0 0 " "
Mild Steel Bars, 3 15 0 " 9 5 0
Hoop Iron, basis price, 9 5 0 " 9 10 0
" Galvanized, 17 19 0 " "
("And upwards, according to size and gauge.)
Sheet Iron, Black—
Ordinary sizes to 20 g. 9 15 0 " "
" 24 g. 10 15 0 " "
" 26 g. 12 5 0 " "
Sheet Iron, Galvanized, flat, ordinary quality—
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g., 12 15 0 " "
Ordinary sizes to 22 g. and 24 g. 13 5 0 " "
" 26 g. 14 5 0 " "
Sheet Iron, Galvanized, flat, best quality—
Ordinary sizes to 20 g., 16 0 0 " "
" 22 g. and 24 g. 16 10 0 " "
" 26 g. 18 0 0 " "
Galvanized Corrugated Sheets—
Ordinary sizes ft. to 6 ft., 20 g., 12 10 0 " "
" 22 g. and 24 g. 13 0 0 " "
" 26 g. 13 15 0 " "

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Prelimins.	Designs to be Delivered
Library Building	Benwell and Fenham U.D.C.	75l., 40l., and 25l.	Sept. 30
Private Street Works	Wallasey U.D.C.	Not stated	do.
New School, Poulton	do.	250l., 75l., and 50l.	Oct. 31
New Public Offices	do.	400l.	Dec. 31-05
Drainage Scheme	Spezia Municipality		

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Public Street Lighting, Roundhay	Fulham Borough Council	H. H. Hodgson, Surveyor, North-lano, Roundhay	Sept. 10
Mountain Ash U.D.C.	do.	Council's Surveyor, Public Offices, Mountain Ash	do.
Jarrah Wood Paving	Finsbury Borough Council	Borough Surveyor, Finsbury Town Hall, Rosebery-avenue	do.
Tar Paving and Re-setting Kerb, etc.	Stevenage U.D.C.	Council Offices, Stevenage	do.
New Tower & Compl. of Church, St. Anne's-on-Sea	Lewisham Guardians	Union Offices, 286, High-street, Lewisham	do.
Supply of Timber	Kingston Guardians	Union Offices, Norbiton, Kingston-on-Thames	do.
Supply of Granite	Chorley Corporation	Borough Surveyor, Town Hall, Chorley	do.
Paving Setts and Kerbs	do.	do.	do.
Flags for Street and other Purposes	do.	do.	do.
Broken Granite and Chippings for Road	do.	do.	do.
Limestone Chippings	do.	do.	do.
Glazed Earthenware Pipes for Sewers and Drains	do.	do.	do.
Painting at Children's Central Home, Roundhay	Leeds Guardians	The Clerk, Poor Law Offices, Leeds	Sept. 20
Light Railway Extension	Baling Town U.D.C.	Hawtayne & Zedon, 9, Queen-street-place, B.G.	do.
Erection of Free Library, Horbury	Horbury U.D.C.	B. Watson, Architect, Station-road, Batley	do.
Alterations and Repairs to House	Kingston-on-Thames Guardians	W. H. Hope, Architect, Seymour-road, Hampton Wick	do.
Road Metal	Bangor U.D.C.	Town Hall, Bangor, Co. Down	do.
*Reconstruct. Edge over Grand Junction Canal at Acton-la.	Wilkesden D.C.	Edwin Thomas, 21, Surrey-street, Strand, W.C.	do.
*Sewer Works in Wexlow-road, Harlesden	do.	O. Claudio Robson, M.I.C.E., Public Offices, Dyne-rd., Kilburn, N.W.	do.
*R'dm'g. Works, S. Approach-rd., Acton-la., Wilkesden	do.	do.	do.
Machine Tools	Manchester Tramways Committee	Tramways Department, 55, Piccadilly, Manchester	Sept. 21
Making-up Epious Mews	Sowerby Bridge U.D.C.	Waterworks Manager, Council Offices, Sowerby Bridge	do.
(1) Supply of Water Pipes; (2) Excav. of Pipe French	East Indian Railway	Secretary's Offices, Nicholas-lane, E.C.	do.
Copper Firebox Plates and Steel Panel Plates	Leiston-cum-Sizewell U.D.C.	J. Baldry, Snape-road, Leiston	do.
Sewers and Concreting Footways of Street	Hazle Grove and Bramhall U.D.C.	S. S. Monaghan, Council Offices, Sowerby Bridge	do.
Paving, etc., Works	Sevensoals R.D.C.	R. Bailey, Surveyor, Sunnidge	do.
Hire of Steam Road Rollers	Metropolitan Asylums Board	G. Armstrong, Architect, 24, Bank-street, Carlisle	do.
Erection of Warehouse, Abbey Town, Carlisle	Hammer-smith Borough Council	Office of Board, Embankment, E.G.	do.
Iron Fencing at School, Swaaley	Bedford Borough Council	Borough Electrical Engineer, Caudwell-road, Bedford	Sept. 22
Road Paving Works	Greenwich Guardians	Union Offices, Greenwich, S.E.	do.
Corrugated Iron Building and Fencing, Elice, Wks	do.	do.	do.
Firewood Boards	Warsick County Lunatic Asylum	At Asylum, Hutton, near Warwick	do.
Guernsey Granite Spalls	Monmouth Asylum, Abergavenny	E. A. Johnson, Architect, St. Mary's-chambers, Abergavenny	do.
Supply of Building Materials	Nelson Water Committee	J. Hartley, Waterworks Manager, Town Hall, Nelson	do.
Electrical Generating & Battery-rooms, &c., Asylum	Stratton and Bude U.D.C.	Council Offices, Bude	do.
Cast-Iron Pipes and Valves	Cork Borough Council	City Engineer, Municipal Buildings, Cork	Sept. 23
Outer Lock Gates at Bude Harbour	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Buildings at Waterworks	St. George-in-the-East Guardians	Superintending Civil Engineer, H.M. Dockyard, Devonport	do.
*New Coastguard Buildings, near Lands End	do.	Clerk's Offices, Ranie-street, Old Gravesend, E.	do.
*New Sanitary Arrangements at Schools, Upton Park	Yardley R.D.C.	Council's Surveyor, Sparahill, near Birmingham	Sept. 24
*Painting, etc., at Dispensaries, Clerk's Offices, etc.	Derwent Valley Water Board	E. Sandeman, Barnford, near Sheffield	do.
Making-up Roads	South Shields Corporation	Borough Engineer, Chapter-row, South Shields	do.
Manual Sluice Valves	Southgate U.D.C.	Council's Surveyor, Palmer's Green, N.	do.
Road Materials	River Wear Commissioners	Mayor, Architect, Foston	Sept. 26
*Wood Fencing	Southampton County Council	Engineer's Office, Commissioner's Quay, Sunderland	do.
New Cottage, Cloddlesea, Dylwey	Kingston-on-Thames Educa. Com.	County Surveyor, The Castle, Winchester	do.
765 Tons of Steel Rolled Joint Gearing	Altrincham U.D.C.	F. W. Roper, Architect, 9, Adams-street, Adolph, W.C.	do.
Reconstruction of Stony-lane Bridge	Dunmow R.D.C.	Offices Council, Town Hall, Altrincham	do.
New School	Iford U.D.C.	R. Curtis & Son, 11 and 12, Finsbury-square, E.C.	do.
Extension and Addition of Swimming Bath to Bath	Tipton U.D.C.	C. J. Dawson, Architect, 11, Cranbrook-road, Iford	do.
*Isolation Hosp., Donnam's-la., Gt. Dunmow, Essex	Leathhead U.D.C.	Council's Surveyor, Public Offices, Tipton	Sept. 27
School Furniture	Commissioners of H.M. Works, etc.	Council's Surveyor, Leatherhead	do.
Library Buildings	Aberdeen Harbour Commissioners	H.M. Office of Works, Storey's Gate, S.W.	do.
Road Materials and Labour	Tottenham U.D.C.	Aberdeen Harbour Engineer, Aberdeen	do.
New Sorting Office, Holbeck, Leeds	Leigh (Lancashire) Corporation	Council's Engineer, 712, High-road, Tottenham	do.
Articles for Harbour Works	Hendrewen Building Club	J. C. Frostwich, Architect, Leigh	Sept. 28
*Making-up Roads	Burma Railway Co., Ltd.	W. D. Moran, Architect, Victoria-chambers, Penton, Glam.	do.
Municipal Buildings	Edinburgh District Lunacy Board	Company's Office, 76, Gresham House, E.C.	do.
Erect. of 65 Houses, Road-making, etc., at Treherbert	do.	Hippolyte J. Blanc, Architect, 25, Rutland-square, Edinburgh	do.
Covered Gigs, Wagons, Wheels, etc., Bridgework, etc.	West Ham Union	do.	do.
Electric Wiring and Cables, Bangour Village	Edmonton Guardians	Clerk's Office, Union Workhouse, Leytonstone, N.E.	do.
Telephone Installations	North Dublin R.D.C.	T. E. Knightley, Architect, 106, Cannon-street, E.C.	do.
Electric Bells	Portsmouth U.D.C.	Mr. Morris, Clerk of Works, 59, Abchurch-lane, London	do.
Granite Spalls	First Garden City, Ltd.	W. H. D. Capis, Architect, Church-street-chambers, Cardiff	Sept. 29
New Chapel at Edmonton Workhouse	Southwark Guardians	do.	do.
Erection of Ten Labourers' Cottages	Hill's Plymouth Co., Ltd.	Council's Surveyor, Portsmouth	do.
Alterations to Park Cottage, Hanfrechia, Mon.	Cudworth U.D.C.	C. Hunt, Engineer, 15, Victoria-street, S.W.	do.
Road-making and Paving Works	Saffron Walden Corporation	G. D. Stevenson, Architect, 13, Kings-street, E.C.	do.
Gasholder Tank and Buildings for Gasworks, Herts.	County Council of Middlesex	do.	do.
*Building an Area for Boiler Clinker Storage	Guilford Town Council	Company's Offices, Merthyr Tydfil	Sept. 30
*Drainage, Sanitary Works, etc., at Inlrmay	Paddington Borough Council	Fairbank & Son, C.E., Lendal-chambers, York	do.
Supply of Stores for Twelve Months, Merthyr Tydfil	Erith U.D.C.	Superintending Civil Engineer, H.M. Dockyard, Devonport	do.
Sewerage and Sewage Disposal Works	Brentford U.D.C.	Borough Surveyor, Saffron Walden	Get. 1
*New Coastguard Buildings at Polruan, near Fowey	London County Council	Young & Brown, 104, High Holborn, W.C.	Get. 3
Granite Macadam	Parliamentary Board of Public Works, Dublin	Borough Surveyor, Tuns Gate, Guilford	do.
*Construction of Twelve Cottages	Chatham Education Committee	W. Egerton, 12, Queen's-road, Erith	do.
Broken Granite	Gt. Southern and Western Railway	Council's Engineer, Boston-road, Brentford	Get. 4
Steam Road Roller and Scarifier	Edinburgh Corporation	Parks Department, 11, Regent-street, S.W.	do.
*Erection of Carsheds, Washhouses, Motor Offices	Richmond Main Sewerage Board	Office of Public Works, Dublin	do.
*Forming Roadway and Retaining Wall, Kew Bridge	Wandswoth Guardians	Herbert H. Dunstall, Archt., Bank-chambers, Railway-st., Chatham	Get. 5
Supply of Fine Building Gravel	Poplar Borough Council	Company's Engineer, Inchicore, Dublin	do.
Broken Granite	Wandswoth Borough Council	City Architect, City-chambers, Edinburgh	do.
*Erection of New Council School, 200 Tons of Steelwork in Girders	Board of Public Works, Dublin	Office of Public Works, Paddington, W.	do.
New Washing Hall, etc., at South Gray's-cloze	Wandswoth Guardians	W. Fairley, West Hall-road, Kew Gardens	do.
Construction of Pier, etc., Portnoe, Co. Donegal	Poplar Borough Council	C. A. Sharp, Architect, 11, Old Green-street, S.W.	do.
Pumping Machinery and Electric Motors	Wandswoth Borough Council	J. R. Hunt & Co., 181, Queen Victoria-street, E.C.	do.
*Alterations and Additions to St. James'-road School	Board of Public Works, Dublin	Council's Surveyor, Parkham, High-road, S.W.	Oct. 6
Public Library	do.	Office of Public Works, Dublin	Oct. 7
*Erection of Disinfecting Station	do.	do.	do.
Timber Jetty at Glanageeragh, Co. Donegal	do.	do.	do.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be delivered. Includes entries for Pontypridd U.D.C., Ludlow Corporation, Church Streeton U.D.C., etc.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Includes entries for Bermondsey Borough Council, Harsley R.D.C., etc.

Those marked with an asterisk (*) are advertised in this Number. Competitions. — Contracts, iv, vi, viii, x. Public Appointments, —

PRICES CURRENT.—Continued from page 301.

Table listing prices for METALS (continued), including Soft Steel Sheets, Cast Iron, etc.

Table listing prices for LEAD, etc., including Sheet, Pipes, and various grades.

Table listing prices for ENGLISH SHEET GLASS IN CRATES, including various thicknesses and quantities.

Table listing prices for OILS, etc., including Lined Oil, Turpentine, and other oils.

Table listing prices for VARNISHES, etc., including Pale Oak, Copal, and other varnishes.

TERMS OF SUBSCRIPTION.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is stated, nor any list in which the lowest tender is under 100l., unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted

AMERSHAM.—For grammar school, for the governors of Dr. Challoner's Grammar School, Mr. H. Beldi, architect. G. Darlington, Amersham* £5,268

BRADFORD.—For Sunday Schools and parochial institute (contracts 1 and 3), for the Parish of Saint Clement, Bradford, Yorks. Mr. H. E. Priestley, architect, 17, Bertram-road, Bradford. Quantities by architect:— Mason's Work: O. Booth & Son, Great Horton* £1,120 0 0 Joiner's Work: W. Pickering, Bradford* 573 7 9 Slater's Work: T. Nelson & Son, Manningham* 178 0 0 Plumber's Work: J. W. Bates, Bradford* 96 0 0 Painter's Work: G. Smith, Great Horton* 219 10 0 Bradford* 49 15 0 Total £2,236 18 0

BRIDLINGTON.—For partial remaking, etc., Sewerby-crescent. Mr. S. Dyer, architect and surveyor, 29, Quay-road, Bridlington. J. Ellis* 18 15 0 J. Edmund & Co., 422, Market & Son, Bridlington* 235 0 0 J. N. Davidson* 396 Rington* £323

BURGESS HILL.—For erecting stabling, etc., at Depot, Chilton-road, for the Urban District Council:— Box & Turner, 2353, 0 0 A. Downer, Burgess Hill* 342 15 6 W. Orman* 330 10 0 W. Bryant* 330 10 0 gess Hill* £312 0 0

CARDIFF.—For erecting an electric light sub-station at Adelaide-street, at the Dock, for the Corporation. Mr. W. Harpur, Borough Engineer, Town Hall, Cardiff.— M. D. W. Davies, St. Mary's-street, Cardiff* £1,830 19 7

CARDIFF.—For 190 yards of wrought-iron unclimbable fencing at Cathays Park, for the Corporation. Mr. W. Harpur, Borough Engineer, Town Hall, Cardiff:— Rubery & Co. £293 11 6 Mountford, Phillips & Co., Ltd., 270 15 0 W. A. Baker & Co., Ltd., 243 11 9 W. Rowe* 213 11 9 Llansantant* £140 6 4 G. Kyte & Co. 212 6 8

CHIPPING CAMPDEN.—For water supply works, Campden (Contract 2), for the Rural District Council. Messrs. Wilcox & Raikes, engineers, Union-chambers, 63, Temple-row, Birmingham:— Reid Bros., £2,418 0 0 T. Vale & Sons, G. M. Kerry & Co., 2,105 0 0 J. Riley, 1,831 3 5 W. H. Smith & Sons, 2,070 0 0 Rowell & Sons, Rogers & Wood, 1,896 0 0 Chip-ping Norton* 1,801 4 0 J. E. Witte .. 1,850 0 0

CHIPPING CAMPDEN (Glos.).—For waterworks (Contract No. 1), for the Rural District Council. Messrs. Wilcox & Raikes, engineers, Union-chambers, 63, Temple-row, Birmingham:— J. & R. Ritchie, Ltd., £1,252 2 3 Yarrow & Co., 1,204 0 0 A. G. Clarke, 1,196 16 8 Staunton Ironworks Co., Ltd., 1,146 10 0 T. Spittle, Ltd., 1,143 11 8 T. Sca Foundry Co., 1,136 4 3 Cochran & Co., 1,118 11 5 Stavley Coal & Iron Co., Ltd., nr. Chesterfield* 1,093 18 3 J. & S. Roberts, Ltd., 1,077 15 9 D. Parsons & Co., 1,029 4 11

CRUMLIN.—For sinking wells and providing pumps at Crumlin, for the South Dublin Rural District Council. Mr. T. J. Byrne, A.R.I.B.A., surveyor, etc., 1, James-street, Dublin:— P. Stevens* This work is tendered for on schedules; the price of a P. Hoaly will cannot therefore be known until it is completed. J. Grace, 124, Coombe, Dublin*

DRIFFIELD (Yorks.).—For constructing a main sewer at the east end of North Frodingham Village, for the Rural District Council. Mr. T. Carson Beaumont, C.E., surveyor, Driffield:— A. Leason* £195 0 0 J. W. Hall* 2163 0 0 W. Leason & Son* 185 0 0 T. Cammidge, R. Fisher* 180 10 0 N. Frodingham* 179 10 0 J. Dunn* 118 17 3 ham*

EAST SHEEN.—For alterations to Nos. 65 and 67, Sheen-lane, Mortlake, for Mr. J. W. Saunders, Mr. R. B. Rowell, architect, Triangle-corner, East Sheen, S.W.:— S. N. Soole & Son £302 0 Hayes & Co., St. Leonard's-road, East Sheen, S.W. £248 0 Speecheley & Smith 278 10

EPPING.—For erecting Council Buildings in High-street, for the Urban District Council:— J. W. Hall* £907 10 0 A. Knight £940 0 0 H. Wells & Sons 990 0 0 T. Keen* 939 12 6 C. S. Foster & G. Whiffin, Son* 985 0 0 Coopersale, T. Ahmad & Epping* 748 5 0 Son, Ltd.* 975 0 0 [Accepted provisionally.]

HARTSHORNE.—For pulling down old bridge in Green's-lane, and erecting a new bridge, for Hartshorne and Seals Rural District Council. Mr. A. Lewis, surveyor, Smisby, near Ashby-de-la-Zouch:— E. Clarke* £295 0 0 Woodville* 295 10 0

HEREFORD.—For the erection of cycle and motor works and alteration to premises, 116, St. Owen-street, for Mr. A. W. Marriott. Messrs. Grooms & Battington, architects and surveyors, Palace-chambers, King-street, Hereford. Quantities by the architects:— P. Cooke* £1,508 15 4 W. Powell* £1,122 10 0 Bolt, Davies, & Co., 1,335 0 0 C. Cooke, Hereford* 1,108 0 0 W. Bowers & Co., 1,130 13 0

HERTS.—For Baptist Church, Breachwood Green, Welwyn, Herts. Messrs. George Baines and R. Palmer Baines, 5, Clement's-lane, Strand, London, W.C., architects:—

Table with 2 columns: Estimate A and Estimate B. Items include F. Gough & Co., D. Parkins, T. & E. Neville, C. Miskin & Sons, F. Newton, W. G. Dunham, T. Almond & Son, Ltd., Goldhawk & Son, S. Redhouse, Mallet & Wood, Grove-road, Luton.

HESWALL (Cheshire).—For the construction of Dawson road, for the Wirral Rural District Council. Mr. T. Davies, 33, Kingsland-road, Birkenhead;— R. T. Amery, S. Hutton, Bowdon; £650 Parkgate; £686 10 R. Hughes, Brimstall; 625 † Not accepted, being above the estimate.

IPSWICH.—For the erection of receiving wards at the Workhouse, Woodbridge-road, for the Guardians. Messrs. Brown & Burgess, architects, Prince's-street, Ipswich;— S. A. Kenny, Bursell-street, Ipswich; £1,377

MAWNAN (near Falmouth).—For erecting a country house and stables at Higher Treose, Helford River, for Mr. H. Coode. Mr. B. C. Andrew, architect, Biddeford's Court, St. Austell;— S. Treharne, £4,194 0 A. Carkeo, £2,951 0 C. & J. Harris, 3,278 16 J. Collier, Truro, 2,282 0

MILLISLE (co. Down).—For main sewerage, outfall sewer, flushing tanks, &c. for Lord Dunleath. Mr. J. Russell, C.E., 22, Waring-street, Belfast;— J. A. Gordon, £590 H. McNeilly, £370 J. Graham, Jun., 442 Path, Clarke, & Son, 370 M. Green, 442 H. Alexander, 4 J. Ross & Son, 438 Waring-street, Belfast; J. Quinn, 397 fast, £365

PLYMOUTH.—For electric light installation at Municipal Technical School, for the Education Authority. Mr. H. J. Snell, architect, 11, The Crescent, Plymouth;— Messrs. Heath & Co., Plymouth, £550

PLYMOUTH.—For fitting up hot water heating apparatus and gas installation at the Technical Schools, for the Education Authority. Mr. H. J. Snell, architect, 11, The Crescent, Plymouth;— W. T. Hocking, Plymouth, £820

RETFORD.—For the erection of residence, London-road, for Rev. Justice Chapman. Messrs. Byre & Southall, architects, Chapelgate;— G. Fenton, £3,274 C. Jones, £2,666 G. Hopkinson, 2,183 F. Fenton, 2,024 G. Ledger, 2,166 T. Hopkinson, 2,023 G. Hurst, 2,131

RICHMOND (Yorks).—For relaying pipe sewer, etc. for the Corporation. Mr. T. H. Bailstone, Borough Surveyor, Richmond;— J. Spark, 30, Marshall-st., Darlington, £126 13

ROBERTON (N.B.).—For 11 miles of cast-iron pipes and a concrete-covered service tank, etc. for the District Committee of the Upper Ward of the County of Lanark. Messrs. Warren & Stuart, engineers, 94, Hope-street, Glasgow;— R. C. Crawford, Strathaven, £534 8 4

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Table with 2 columns: Estimate A and Estimate B. Items include G. F. Hurst & Sons, Roles & Sons, F. Osman, P. Douglas & Richards, P. Tryhorn & Son, Salisbury.

SELBY.—For laying 1,105 yards of 12-in. stonewares pipes, &c., for the Urban District Council. Mr. Bruce McGregor Gray, A.M.I.C.E.;— J. T. Short, £349 5 10 J. Smith, £241 17 4 J. Slinger, 298 12 11 Selby, £241 17 4 T. Bell, 296 9 9 G. Hird, 241 1 1 A. Speight, 245 1 3

STANFORD-LE-HOPE (Essex).—For executing street works, for Essex Rural District Council. Mr. S. I. Adams, surveyor, Weston-chambers, Southend-on-Sea;— G. W. Cooke, £3,992 11 3 J. E. Truman, £2,999 0 0 W. E. Westgate, 3,465 0 0 Buxton & Jenner, 2,693 0 0 G. J. Anderson, 3,157 2 1 W. Hes, 2,509 0 0 T. Bruty, 3,071 1 10 J. Jackson, 2,325 0 0 Wilson, 3,047 17 8 Gate, ..

STOCKTON-ON-TEES.—For alterations and additions to Children's Home, Hartington-road, for the Guardians. Mr. John Rosham, surveyor, Flukes-street, Stockton-on-Tees;— J. Coulllard, £468 5 11 R. Johnson & G. E. Grey, 456 3 2 Sons, £433 17 6 T. Brown, 446 0 0 W. G. Atkin, J. G. Robson, son & Son, 443 2 8 Stockton-on-Tees, 427 12 7 G. Race & Sons, 440 0 0

WAREHAM.—For water supply works, for the Corporation. G. Chatterton, engineer, 6, The Sanctuary, Westulaster, S.W.;— T. Deewra & Son, Balls Pond, London; £5,770 18 11

WHITSTABLE.—For the erection of new infants' school, Crownwell-road, Whitstable, for the Kent Education Authority. Mr. A. A. Kemp, architect;— G. W. Welby, £4,500 A. S. Ingelton, £3,877 Shury Building Co., 4,180 (Gant & Co.), 3,422 T. Porter, 4,140 Amos & Foad, 3,350 T. Gotsdiner, 4,074 E. Solly, 3,270 *Recommended for approval to the works committee.

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ILLUSTRATIONS.

"Science and Art": Relief.....	Mr. Albert H. Hodge, Sculptor.
County Hall, Northallerton.....	Mr. W. H. Brierley, Architect.
Penn House, Weston: as altered.....	Mr. R. Blomfield, F.S.A., Architect.
Blackwood House, Byfleet.....	Mr. G. L. Sutcliffe, A.R.I.B.A., Architect.

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The Ancient Buildings of Nippur.



It is hard to say what reasons led up to the building of the great Temple of Bel and its adjoining city at such a site as Nippur. We know, of course, that the Shatt en-Nil, one of the finest waterways of the Mesopotamian canal system, ran past the city; and we may conjecture that in early days some kind of stream flowed there; but even so, why should the exact spot have been selected rather than one further north or south? There is no rise in the plain to account for the builders' preference; the country lies away in all directions flat as a table-top, the only break in its level being the mounds that cover the ruins of ancient cities, of which it is safe to say none were older than Nippur. In probability chance had much to do with the founding of the city. For the reason the site became intimately associated with the cult of the god; from the seedling of a primitive temple or altar erected in his honour the temple gradually grew and spread, in the earliest days of which we know anything certain as yet it was the venerated sanctuary in the land, when at last the outworn worship of Bel was cast aside, the ruins of his temple formed a convenient form for the erection of other buildings.

supposing that the site was occupied six or seven thousand years before Christ; it is certain that it was still the scene of man's dwellings so late as 800 A.D., although it had sunk to an insignificant position early in the IIIrd century; and it was not utterly abandoned until two hundred years later. Throughout the long centuries of its history, during which it was the scene of much activity in the way of building and restorations, its architects must have been greatly hampered by the lack of any material other than the Mesopotamian mud. In the north stone could be obtained with comparative ease, but at Nippur there was nothing but the mud and clay available. When, in addition to this fact, we remember the extreme antiquity of the site, and consider that the early builders had no experience acquired from other nations to aid them, being, in fact, pioneers in the building world—instead of wondering at the crudeness of their structures, we are forced to admire the success they achieved in face of the difficulties that confronted them. In order to present a picture of the buildings thus far uncovered by the American expedition which has been excavating at the mounds it is necessary in the first place to describe the materials used in their construction. It will then be seen how the lack of stone and the scarcity of suitable timber necessitated clumsy makeshifts and fettered the ambitions of the architects, forcing them into narrow channels that led to the evolution of a style in which ponderosity took the place of grace,

and massiveness was substituted for beauty and finish. For our purpose the history of the site may be divided into three periods:—(a) Before Sargon (c. 3,800 B.C.); (b) from Sargon and his son, Naram-Sin, to Ashurbanipal (668-626 B.C.); and (c) post-Babylonian. In dating the buildings the different styles of bricks used have proved extremely helpful. Naturally the inscribed bricks are usually easy to determine; but the uninscribed specimens also, especially the burnt ones, show considerable variations at different periods. To enter into the peculiarities of the differing types and to give even average dimensions of them would take up too much space for the limits of this article. It must suffice to give a few examples and to mention the chief characteristics of those used in the buildings described. The earliest builders doubtless used sun-dried bricks only; but, though the precise date at which the art of burning bricks was first practised at Nippur cannot be given, it is certain that it was a very early one. It is a point worthy of mention that the pre-Sargonic burnt bricks in point of size and shape are much more like the standard of to-day than were those of a later period. The first examples were 8 $\frac{3}{4}$ in. by 5 $\frac{3}{8}$ in. by 2 $\frac{1}{2}$ in.; the next, 10 $\frac{1}{4}$ in. by 7 in. by 2 $\frac{1}{2}$ in.; then comes a larger but flatter brick, 11 $\frac{1}{2}$ in. by 7 in. by 1 $\frac{3}{8}$ in.; and, finally, 12 in. by 7 $\frac{3}{4}$ in. by 1 $\frac{7}{8}$ in. In the first examples the shape is peculiar, for one face is markedly convex, and on the lump there is generally a deep thumb-mark

(and sometimes as many as four), probably intended to give a better grip for the mortar. In subsequent examples the thumb-mark becomes less pronounced and a longitudinal mark, made with the finger-tip or with a cut reed, appears in conjunction with it. Finally, the thumb-mark disappears entirely, and two or more of the reed-marks take its place. In some examples the bricks are marked along their edges with a depression, which seems to have been made either with a finger or a reed when they were being taken from the mould. In building drains and wells, for which they were largely used, the bricks were usually set on edge and at an angle, alternate courses sloping in opposite directions, and thus forming a kind of herring-boning; and it may be noted that in early Babylonian writing the sign for "brick" represents rows laid in this fashion. These bricks were usually laid in mud, but in watercourses and at certain spots where extra strength was required bitumen was employed, being brought, no doubt, then as now, from the famous springs at Hit. That the builders were quite alive to the superior qualities of stone is shown by the fact that it was employed for the foundations of the earliest gateway that was uncovered, where blocks of gypsum set in bitumen occur in the foundations. They also exhibited considerable skill in making vertical and horizontal drains and sinks of terracotta, U-shaped channels for watercourses, drain-pipes of various shapes and sizes, and large vases and jars.

In the second period a great change takes place. The burnt bricks are henceforth always made in a square, or nearly square, mould, and, losing all trace of convexity, become flat. Moreover, they very generally are stamped with a short cuneiform inscription setting forth the names and titles of the king for whom they were made, while no example of an inscription on a pre-Sargonic brick has been found at Nippur. The inscription was nearly always placed on one of the larger faces of the brick, which was carefully laid face downwards (except in the case of such bricks as were re-used by later builders); but at least one brick was found with an inscription* upon its edge. Stone makes its appearance in the form of finely cut and polished door-sockets. A few glazed bricks of the time of Ashurbanipal were found by Dr. Peters, the first director of the American work. And bitumen is employed liberally, especially in the construction of watercourses and aqueducts.

In the last period burnt bricks are not so commonly made use of, and those employed are generally old ones obtained from the earlier structures, but in certain parts we find specially-moulded ones. The unbaked bricks are often made of material obtained by breaking up older ones, and in very many cases contain coins, beads, cylinders, and objects of a similar character, which were doubtless intended as amulets and offerings to secure good fortune to the building. In some instances plaster is used as a finish to the walls and for stuccoing.

Until the work of excavating is carried

further it will be impossible to offer more than a few detached notes upon the pre-Sargonic constructions, for in nearly all cases they lie buried deep beneath the buildings of a later period, nearly a score of distinct strata being discernible at some parts of the site. But sufficient remains have been uncovered already to show that at a very remote period the civilisation of Nippur was in an astonishing state of advancement. One of the most interesting discoveries made was that of an arch which was certainly constructed about six thousand years ago. It was built in connexion with the highly-elaborated system of drainage of the Temple of Bel, and served to protect two pipes (each about 8 in. in diameter) which carried the water from different directions to a point within the temple enclosure. In passing it may be noted that numbers of small pipes, specially moulded in T-form, were discovered in the neighbourhood of this drain, and that Dr. Hilprecht, the scientific director of the excavations, considers that they were "joints intended to unite terracotta pipes meeting each other at right angles." The twin pipes were made up from 2 ft. sections laid and jointed in clay and protected by walls of brick from which the arching sprung. The arch was built with burnt bricks (12 in. by 6 in. by 2½ in.) of a light-yellow colour. Its curve was effected by the simple process of forming the joints between the bricks of wedges of the clay which was used as mortar; and above its crown was a small pipe, apparently intended to drain off any water that might soak through the soil and threaten the arch itself. The vaulting was strengthened by a pier in the centre which carried a horizontal support; and that this strutting was a well-considered addition to the primitive bit of building was clearly demonstrated when upon its removal the arch itself settled seriously under the heavy weight above it. Apparently the drain had caused some difficulty to later builders, for above it we found a most solidly-built foundation, in the form of an L, with the angle corresponding to that of the ziggurat above it. This foundation block was built with particularly well-made crude bricks (averaging 16 in. square by 3½ in. thick), its arms were about 12 ft. thick, and it was 11 ft. in depth. Above the end of the vaulted drain and parallel with the face of the ziggurat ran a dwarf wall or curbing of pre-Sargonic burnt bricks, its base being 10 ft. above the bottom of the drain. This probably marks the boundary of one of the earliest enclosures of the temple; and it seems extremely likely that the two pipes of the drain met originally at the angle of the ziggurat of the corresponding period; for we shall see that the latter building was frequently enlarged by successive kings and governors. Within the enclosure and to the west of the drain stood a rectangular structure, built of crude bricks laid in bitumen, with a slightly-hollowed top, which has been shown by Dr. Hilprecht to be a crematorium.

The evidence of the trenches indicates that in these very early days of its history the temple was comparatively a small building. That the ziggurat existed before Naram Sin is beyond

doubt, but it is impossible to say present how large it was or what it was built of crude brick only, or the later structures, was faced with burned bricks. It will therefore be advisable to leave all description of the temple proper to a later paragraph, merely pointing out that the features of the building were present throughout its history, although its dimensions were slightly varied from time to time.

But before leaving this period mention must be made of the gateway which was discovered in the line of the city to the north of the temple, for it is to show what the pre-Sargonic builders could do with their unhandy bit of stone. It lay beneath the present level of the plain, and unfortunately much of the material used in its construction had been removed by later builders; happily of the lower portions a considerable amount remained, and there was just enough of the opposite side left to enable us to determine the width of the opening and to gather a clear idea of the plan of the gateway. The wall itself was built of crude bricks, but the gate opening was of baked bricks. Its face projected beyond the main line of wall, and from front to back of the gate was a distance of 35 ft. The centre lay a roadway, 12 ft. wide, for the use of vehicles and beasts of burden; while on either side was a narrow way, 4 ft. wide, for pedestrians. In the central portion, the road, sloped gradually upwards from the exterior, and was paved with bricks, and at its ends there seems to have been a stone curb for the gate to close against. In this portion of the structure and the edges of the footways lay the foundations of gypsum blocks which has been mentioned above. On either side of the roadway the walls of the footways were built with a batter, and a dwarf wall ran along the side of the walk near the road. The footways themselves were approached by short flights of steps, which the tread of each step is slightly narrower than the one below it. An important point to be mentioned is that the stone is slightly wider at its foot than at its head, being narrowed by stepped receding courses. This characteristic feature of Babylonian gateways was found in a more advanced stage in all the entrances to the temple and will be noticed lower. The gateway had plainly been rebuilt at a later period (but still pre-Sargonic), when the original construction of the wall had been somewhat altered, as was shown by the difference in the axes of the two stairways. It is probably a period of three or four hundred years elapsed between the building of the first and second gates, for there is a difference in their levels of nearly 10 ft. In the second structure the bricks are larger than those of the earlier period, but its character was quite similar to both periods, it is almost certain that a moat or canal lay outside the wall, and the gateway was probably approached by means of a bridge.

The remains of the second period are by no means complete, sufficient material is already at hand to form an intelligible picture of the temple and certain other buildings of importance. It is necessary to observe

* Of Shagarakti-Shuriash, King of Babylon (circa 1350 B.C.).

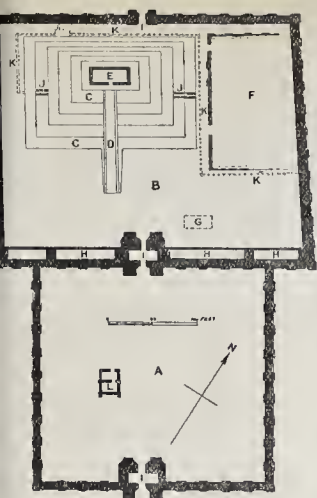


Fig. 1. Sketch Plan of Temple of Bel (restored in accordance with Dr. Hilprecht's Theories).

Outer Court. Inner Court. Ziggurat. Approach to Do. Shrine of Bel. House of the God. House for Honey, Cream, and Wine. H—Storage Vaults. I—Gates. J—Water Conduits. K—Water-Courses. L—Chapel of Bel (one of many in this outer court).

NOTE.—A and F are to a great extent unexcavated, and the position of G is somewhat conjectural.

However, that in the short account given how it has been impossible to select the buildings of any particular period for description; for we are compelled to fill up the gaps in one period by the materials of others; but the conservatism of the builders, who were ever desirous of keeping the character of the place as constant as possible, enables us to make such restorations with so much certainty that the picture given may be regarded as quite reliable in essential points.

The temple proper consisted of two courts, the outer one being open to worshippers, while the inner one was reserved for the priests and servants of the god (A and B, Fig. 1). In the inner stood over a score of shrines, or houses of the gods, who were worshipped at Nippur. In the latter were a great ziggurat (C, Fig. 1), the House of Bel (F, Fig. 1), a store house "for honey, cream, and wine" (G, Fig. 1), and possibly some smaller buildings. These two courts were encompassed by a wall, which is called in the inscriptions *Imgur Marduk* (Fig. 1).

At the sides and rear of these two courts stretched a very large enclosure. Behind the second court there lay outbuildings, more storehouses, servants' quarters, and so forth; and at the east angle, in all probability, stood the residence of the *patesis* of Nippur and the dwellings of the upper priests. These three sections—the two courts of the temple and the adjacent compound—which evidently constituted the sacred quarter of the city, lay on the east bank of the Shatt en-Nil, and were enclosed by *Nimit Marduk*, the outer wall. Whether the rest of the city was walled or not yet been ascertained, but probably was not. The position of *Nimit Marduk* varied but slightly at different

periods of the city's history; and that of *Imgur Marduk* was most likely constant—at any rate after the days of Naram Sin. It was in the line of *Nimit Marduk* that the pre-Sargonic gateway was discovered, and doubtless an entrance stood at practically the same spot throughout the succeeding centuries. Like the gateway, the wall itself was rebuilt from time to time, but the principal remains discovered by us belong to the time of Naram Sin (c. 3750 B.C.) and of Ur Gur (c. 2700 B.C.). Both the royal builders used crude bricks for the bulk of their work, Naram Sin employing huge specimens (19 in. by 19 in. by 3 in.), most of which were stamped, while Ur Gur's were much smaller and unstamped; but a finely-built water conduit was discovered at an outer angle of the former king's structure, built with burnt bricks laid in bitumen; and it is extremely likely that the gateways at least were faced with the same material.

Nimit Marduk was an imposing wall, solidly constructed, and worthy of its purpose. Its exterior was broken up by buttresses, spaced about 30 ft. apart, averaging 11 ft. in width and 2 ft. in depth. Both faces were built with a batter, and both were plastered with mud and clay. Its thickness in the days of Naram Sin remains undetermined, owing to the poor state of preservation of its inner face, but it was probably over 30 ft. In Ur Gur's time it was about 25 ft. 6 in. thick at its base. Nowhere does sufficient height remain to show the top, but it was probably about 20 ft. wide, and, on the bases of pictorial representations of similar structures, we may conclude that it was finished off with a battlemented parapet.

The best preserved portion of *Imgur Marduk* is found in the wall which separated the two courts of the temple. This is built of small crude bricks (about 8½ in. by 6½ in. by 3¼ in.), and, like the outer wall, has a batter and is divided by equally-spaced shallow buttresses into a series of panels. The lower portions of the gateway in this wall are well preserved. After the usual Babylonian custom its faces were decorated with narrow vertical panels, and it was

narrowed by means of stepped recessing, the gateway itself being only 6 ft. wide, while the width between the pylons was 14 ft. In the thickness of the walling upon either side of the gate was a small chamber, apparently intended for the use of the door-keepers. The door turned upon a metal shod pivot, resting in a door-socket, which was built round with burned bricks specially moulded for the work. The royal builders were always extremely proud of their door-sockets, and were careful to inscribe their names and titles upon them. The one found in position at this entrance was originally used by Ur Gur, and its inscription, which Dr. Hilprecht has kindly interpreted for me, runs:—"To Bel, King of the countries, his king, Ur Gur, the powerful champion, King of Ur, King of Shumer and Accad, E-kur, his beloved temple, has consecrated." Ekur, it should be explained, was the old name of the temple, and "king of the countries" is simply another expression for "ruler of the world." The socket itself, as we found it, had been re-used, probably by Ashurbanipal, who placed it in position for his own entrance (Fig. 2). The doorway appears to have been approached by a causeway built up in shallow slant-steps of burnt brick. Inside the door stood a circular pedestal, built with shallow slabs of stone, and a curious tank, or box, of burned bricks; and the jambs of the doorway, at the later period, at least, were of burned brick.

In the wall behind the ziggurat (N.W.), and in line with this gate, we found a second one, of similar construction, but smaller and somewhat less elaborate; and there is every reason to suppose that a third gate of the same nature stood in the south-east wall of the outer court. This, of course, would be the entrance used by worshippers at the temple, who probably landed at a quay on the canal which branched off from the Shatt en-Nil in this direction, and joined the moat referred to in connexion with the pre-Sargonic gate.

Within the second enclosure, and at its west angle, was placed the ziggurat, or stage tower. It consisted of five platforms or stages, on the topmost of which



Fig. 2. Photograph of Door-Socket

stood a shrine of Bel; but at the present day traces of two stages only can be made out with any clearness, owing to the operations of later builders and the ravages of time. As has been observed already, the ziggurat grew from quite small beginnings, many kings helping to enlarge and improve it. Ur Gur faced it with burned brick and widened its causeway by adding walls of the same material on either side; later kings patched and repaired it, at the same time frequently laying a new pavement over the courtyard; and in Ashurbanipal's time it was a huge mass, 190 ft. by 128 ft. on plan, with panelled faces and cased throughout in burned brick. Its longer sides were the north-west and south-east. On each of its shorter sides was a watercourse (J, Fig. 1), similar to those structures found by Loftus at Warka, which he describes as buttresses (*comp.* "Chaldea and Susiana," p. 167). They were constructed in burned brick, set in and finished with bitumen, and they drained the different stages of the ziggurat into a channel at its base (K, Fig. 1), which seems to have led to a shallow basin at the rear, whence another watercourse conducted the water outside the temple walls. The approach to the different platforms was placed on the S.E. face, nearly centrally; but it was not opposite the gateway, lying slightly to the south-west. It also was cased in burnt brick, and its walls had a slight batter. No remains of steps were found, but it is tolerably certain that the approach was made by stairs and not by a simple slope (D, Fig. 1).

In the north angle of the court stood the "house of Bel," the earthly residence of the god and his consort, Beltis. This building still awaits excavation; but we know that its outer walls were faced and panelled with burnt brick, and that bitumen was used liberally to make them waterproof, thus ensuring a dry dwelling for great Bel; and in the south-west façade two doorways have been discovered, one about 10 ft. and the other about 5 ft. wide. Also it is apparent that within the house were many small chambers and apartments, divided by walls of crude brick, and that some of them served for store chambers for the most valuable property of the temple. Between this house and the south-east wall of the court stood the "house for honey, cream, and wine." No actual remains of this store have yet been brought to light, its existence being known only by means of inscriptions; but my own belief is that it was built parallel with the courtyard wall, and to the right of the gateway, where traces of foundations of burned brick walling and steps were discovered (G, Fig. 1).

Lack of space forbids of any further description of the temple buildings. But sufficient has been written to show that the excavations have already served to alter several ideas that have hitherto been held with regard to Babylonian temples. The mere fact of the god having a "house," a shrine and a chapel in close proximity, is a significant point to note; and we can now see plainly that the ziggurat was not the only important part of the temple; but the discussion of such questions hardly falls

within the scope of this article. It is unfortunate that the old buildings should have suffered as they have at the hands of later builders, for though they still present many interesting features, there are others, such as their decorative treatment internally and the manner of finishing off the tops of the gates and walls, concerning which we know practically nothing. What we do know may be summed up thus:—(a) The temple consisted of the two courts and their contained buildings. (b) The courts were paved with burned brick pavements, across which in various directions ran waterways, some formed of terra-cotta pipes or channelling set in brick, some only of brickwork lined with bitumen. (c) The outer court held many chapels dedicated to different gods and goddesses, but the inner one was kept for Bel alone, of whose buildings the ziggurat and the "residence" taken together may be regarded as the most holy portion of the temple. (d) While the walls of the courts were of crude brick only, the principal buildings were faced with burnt bricks. (e) The drainage of the temple was carefully considered and well devised. (f) The architects aimed at impressing beholders of their work by size rather than beauty and proportion; and (g) they very commonly failed in such matters as setting out their walls at right angles, but in point of strength they achieved wonderful success.

The library and schools of the old city lay on the same side of the Shatt en-Nil as the temple, but a branch canal separated the two quarters. The secular buildings were constructed almost entirely in crude brick, burned being used only occasionally for door jambs and thresholds. The impression gained from a study of the rooms thus far excavated (about eighty) is that they belonged to a number of distinct houses, opening off from narrow streets. They

vary in size from about 9 ft. by 4 ft. to nearly 30 ft. by 15 ft. Although they were used for such important purposes they must have been dark and cramped; it appears that very little pains were used to make them attractive, and nowhere did we find a second storey. In some of the rooms we found ledges of brickwork covered with bitumen, which served as shelves for the clay tablets that constituted the library of the ancient university; but in all likelihood wooden shelves also were provided, and such numbers of tablets as have been discovered already could hardly have been stored on the ledges alone. It is noteworthy that even in the small apartments the walls are not at right angles in the majority of the rooms, an observation that applies to most of the shops and houses discovered in other portions of the site also. Because these buildings were nearly always constructed of sun-dried bricks, it is an extremely difficult matter to excavate them satisfactorily, for their walls, when first uncovered, look exactly like the debris which fills the chambers, and consequently the Arab workmen frequently cut away portions of them. In the future excavations it is to be hoped that better results will be attained by improved methods of working.

In many cases the old builders seem to have gone about their work in a very haphazard style. Frequently they do not dig foundations at all, as is indicated in the case of a retaining wall of the cemetery to the west of the Shatt en-Nil, where the difference of level of the lower courses shows quite clearly that the bricks were laid immediately on the surface of the plain. And this, be noted, was in the case of a fine wall constructed in specially well-made burnt bricks, provided with drains, and extending for a length of over 500 ft.

The mound which covered the library

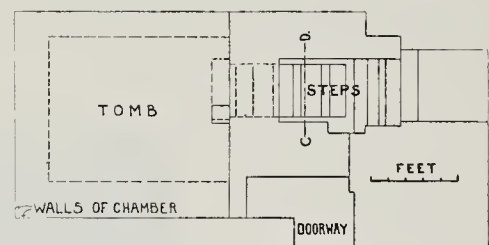


Fig. 3. Tomb Constructed in Burnt Brick beneath a Chamber on Outer Walls of Parthian Fortress.

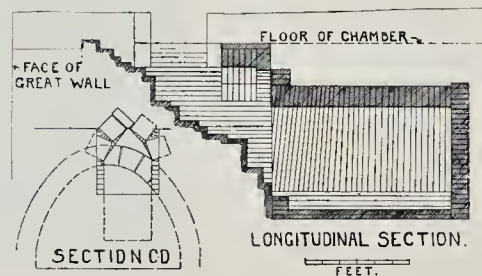


Fig. 4. Longitudinal and Cross Sections of Tomb.

Buildings had been used as a burying ground, and in it tombs of all periods were discovered. One which should be mentioned was a corbelled structure similar to that discovered by Taylor at Highgate, which has been so frequently illustrated. The Nippur example was about 20 ft. by 12 ft., and we found the remains of a stairway leading to it, built of burnt brick, and exhibiting the same stepped recesses as were found in the city gateway. Other interesting

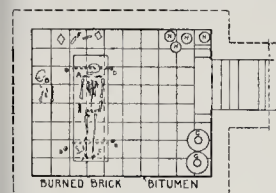


Fig. 5. Plan showing Position of Burials at the time of Opening of the Tomb.

- A—Burial in Wooden Coffin.
- B—Uncoined (?) Burial.
- C—Gold Ornaments.
- D—Silver Coffin Handles.
- E—Iron Bands.
- F—Gold Head-bands.
- G—Water Jars.
- H—Food Platters.

tombs were the barrel-vaulted ones of the Parthian period, which were frequently plastered inside with fine white plaster. Some of them had pavements of brick sloping downwards to their side doors. A fine example of this class was found beneath the floor of a chamber on the outer walls of the great temple which the Parthian invaders erected over the old temple. Figs. 3, 4, 5 illustrate this tomb, which lay beneath a second chamber, counting upwards, in the S.W. wall of the fortress. Fig. 3 is a block plan showing its position with regard to the wall-chamber, Fig. 4 gives cross sections, and Fig. 5 shows the details, etc.

BENEFIT SOCIETIES AND WORKMEN'S COMPENSATION.

THE comments passed upon the operation of the Workmen's Compensation Acts at the recent conference of Oddfellows held at Leicester are deserving of attention at a time when the working of these Acts and their possible extension are under consideration. It must be remembered that the views there expressed were the views of working men in connexion with the Benefit or Friendly Societies managed by themselves or their representatives. They point out that the Workmen's Compensation Acts are causing a serious drain on the funds of these societies, and for two reasons—firstly, because a man who formerly returned to work within a day or two after slight injury now remain at home until they are completely recovered, and the committees tend to compel them to work until complete recovery because of the immense sum such a course has on the compensation received by them under the Acts; secondly, because it tends to shorten the period during which men are considered to be able-bodied, and throws men out of employ at an earlier age or for slight infirmity.

The Oddfellows, in consequence, appeal for legislative assistance, because their Parliament has passed legislation the

tendency of which is to throw men out of employment. The Committee appointed by the Home Office, in their Report on the Workmen's Compensation Acts, have suggested remedies for the latter of the two grounds of complaint set out above, but in our opinion the first objection has never received sufficient attention, although it is of primary importance. The direct tendency of the Workmen's Compensation Acts is to prevent a man from getting well and to prevent his returning to work. If he is for a time totally disabled, it is his interest to remain so until he is so much recovered as to be able to earn his old wages; unless he can earn a sum considerably above his compensation, idleness and half wages are more seductive. The same reasoning applies to the partially disabled. The Friendly Societies, which are admittedly most excellently and economically administered by the men for the men, have always recognised this tendency of human nature, and therefore when a man comes upon the funds he is placed under surveillance and strict rule; he is not allowed to walk more than a certain distance from his home; he is not allowed out after a certain hour; in other words, the relief he receives is given under restrictions. No such drawbacks attend the receipt of compensation under the Acts; a pension of half-pay can be enjoyed with complete liberty. Now, since the rules of the Benefit Societies have been framed by the men in their own interests, it would appear highly reasonable that the Legislature should have taken a leaf out of their book, and we cannot but regret that this view was not dealt with by the Departmental Committee, and that they with their experience should not have suggested some scheme to bring some kind of similar restrictions to bear on persons in receipt of compensation. As it is, the Compensation Acts work in some respects disadvantageously with the Benefit Societies, since the Societies hesitate to stop relief as long as a man is in receipt of compensation; and the Benefit Societies work to the disadvantage of the Workmen's Compensation Act, since in many cases where compensation is being received the arbitrator tries to encourage a man to make some exertion by reducing compensation, but the reduced compensation plus the sick pay still enables a man who is inclined to malingering to continue in idleness.

BONE ALABASTER, MARBLE, AND ONYX.—Mr. De la Croix, British Vice-Consul at Bone, Algeria, writes that the district is renowned for alabaster of the same density as the alabaster of Valterra (Tuscany). The stone, of great transparency, takes a fine polish, and can compete with the finest alabaster of Italy and Scotland. An important marble and onyx quarry, situated at Ouled-Rahmoun, is being worked by a French company. The colours are golden onyx, clouded onyx, notched onyx, red onyx, African red, pink granite, and other varieties—black, yellow, etc. Many of these marbles are similar to those used in ancient monuments of Rome and Carthage.

WAR MEMORIAL, WARWICK.—A memorial tablet, which has been placed in the Collegiate Church of St. Mary, Warwick, in memory of the men of the Warwickshire regiments who fell in the South African war, was unveiled on the 17th inst. The tablet is composed of white and black marble, and has been designed by Mr. Albert Toft, sculptor. The cost was 300l.

NOTES.

The Housing Problem.

It is to be hoped that the correspondence which is now going on in the *Spectator* may do something to quicken public interest and knowledge in regard to the housing problem in rural districts. It is evident from this correspondence that landowners who are anxious to build cheap but yet good cottages are greatly hampered by the by-laws of local authorities. In one instance a landowner was not allowed by the local authority to build some model cottages of wood, because the authority considered that it would be unfair to those who had built cottages of more costly material. The main thing is that cottages at once sanitary and roomy, irrespective of material, should be erected in rural districts where they are required. The fact that wooden cottages cannot last so long as stone or brick is, in some respects, a positive advantage, for then, as times change and internal improvements become understood, new buildings can be erected. It is often a disadvantage to the rural poor that old brick cottages exist, because they cannot, either as regards sanitation or comfort, be brought up to a modern standard. The whole subject of rural housing requires investigation by a Royal Commission, on which experts should be placed. Local authorities who have got it into their heads that cottages should necessarily be of a particular material will require something like Governmental pressure to admit a larger variety of material into their district. The inelasticity of rural by-laws also requires impartial consideration. No subject is of greater importance than that of the housing of the working-classes in our rural districts, and it cannot be too soon taken in hand by the Government.

Trade Disputes.

REFERRING to the statement we made last week of the satisfactory relations which exist between capital and labour since the decision of the House of Lords in the Taff Vale Railway case, we may quote from the latest memorandum issued by the Labour Department of the Board of Trade for August. This Report, although it shows that the labour market was on the whole dull, with a decrease in wages affecting some 355,000 workpeople—a condition of affairs usually conducive to trade disputes—discloses the fact that the total number of workpeople involved in such disputes was only 12,969 as compared with 29,523 in August of last year. The changes in the rate of wages were arranged by conciliation boards as regards 246,000 workpeople, and as regards 109,300 workpeople by direct arrangement between the employers and employed; and out of the latter figure of 109,300 the disputes were arranged without a stoppage of work, except in seven cases, affecting only 4,000 persons. These figures are a tribute both to employers and employed, and also show that, in the absence of the paid agitator, the relations between capital and labour are capable of pacific adjustment in the interests of both.

Ben Nevis
Observatory.

QUITE apart from its value as a conversational topic, the science of meteorology is of national importance, and universal regret must be felt at the announcement made that the observatory on Ben Nevis will be finally closed next month owing to lack of the necessary funds. The unique position of this establishment, at the highest point in the United Kingdom, lends a special interest and gives a peculiar value to the records there obtained. After Greenwich, the observatory is the most important in the whole country, and one that certainly ought to be maintained at the public cost. Unfortunately, the richest Government in the whole world appears unwilling to provide the small annual sum necessary to save the observatory from extinction. The Treasury has been asked for a grant of 600*l.* to defray that part of the annual expenditure of 1,000*l.* which has hitherto been met by subscriptions, but will not contribute more than 350*l.* This is a sorry exhibition of cheese-paring policy. Undoubtedly there are many calls upon the public purse, but it will be nothing less than a national disgrace if the parsimonious methods of Treasury officials are allowed to prevail in the present instance. At this season of the year it is difficult to bring pressure to bear upon the responsible Ministers of the Crown, and permanent officials cannot be expected to act on their own initiative. Hence the chief hope for the continuance of the observatory seems to rest upon the prospect of private support, and as the amount lacking is only 250*l.* per annum, there should be no difficulty in securing the requisite funds if the directors would reconsider their decision not to make any further appeal to the public. Time now presses, and if anything is to be done prompt action is absolutely essential.

The Dee
Embankment.

FOR some years past the officials of the London and North-Western Railway Company have been aware of the perilous condition of the embankment which protects their main line between Holywell and Mostyn, in Flintshire. Owing to the action of sandbanks, the tide in the estuary of the Dee now sweeps portions of the embankment, and a considerable breach in the outer defences has recently been made near Llanerchymor. Between the railway and the sea wall is a strip of land some 200 yds. wide, and as this lies below high-water level it is in imminent danger of inundation, a matter of importance to the owners, but still more important to the railway company. The circumstances leading up to the present critical position are worthy of note. It appears that the Dee Conservancy Board were unable to undertake the works necessary for the preservation of the sea wall owing to the limited extent of their financial resources, and that terms could not be arranged for joint action by the landowners and the railway company, each party apparently thinking the other should bear the greater share of the expenditure involved. Finally, the railway company found it absolutely necessary to take action, and resolved to build a new embankment close to the line, leaving the land to its fate. Thousands of tons of stone, clay and earth have been

transported to the site for the construction of a sloping bank from the permanent way to an adjacent ditch. The work is now well in hand, but, in consequence of the recent breach in the embankment, the position is distinctly critical. It is much to be regretted that the money being spent by the railway company could not be applied to the construction of new works on the river front, thus saving both the land and the railway line. We fear that each side has been playing a game of bluff, with the result that a large slice of the country will be lost.

The
Amenities of
the Thames.

THE Board of Trade have refused to grant their sanction to the projected construction by a trading company of what would be practically a dockyard on Lot's Eyot, a short distance above Kew Bridge, and opposite Kew Gardens. At present the island forms one of a group which partially conceals from view, from the south shore, the unsightly wharves and buildings along the river-side at Brentford. The frustrated scheme had been propounded by the Thames Steam Tug and Lighterage Company, who wanted to take Lot's Eyot for their barge building and repairing works. A petition has been addressed to the Thames Conservancy by the residents of Hampton Wick against the threatened disfigurement of the river-side by the construction of a wharf in a portion of the grounds of Cambridge House. The grounds lie opposite Canbury Gardens, which were laid out at a considerable cost by the Corporation of Kingston, to whom, together with the Hampton District Council, the ratepayers appeal for the preservation of the natural beauties of that reach of the Thames. Steps are being taken to enlist the co-operation of the East and West Ham districts in furthering a movement set on foot by the Stepney Borough Council to secure some sites which still remain vacant, and so to preserve them as open spaces on the left bank of the lower reaches of the river. The Borough Council seek to arrest the gradual closing-in of the Thames in the East-end of London, and, whilst opportunities yet offer, to provide means of public approach at various places on the bank, with open spaces for resort along the shore.

The Great
Antwerp
Fire.

THE extent of this fire has only become apparent after further detailed particulars have come to hand, and the area has been appreciated. Practically ten acres were at one time or other covered by burning petroleum, and two large petroleum stores are entirely wrecked. As to the originating cause of the fire, nothing has yet transpired; but as far as the spread of the fire is concerned, it is obvious that, although a considerable number of safeguards were practised and even required, the negligent manner in which these safeguards were applied led to disastrous results. Thus, the surrounding walls of one of the petroleum stores were too weak and had bad foundations. In the walls of another store openings were left through which the petroleum percolated. Some three years ago we dealt with another great fire at Antwerp

at the Royal Storehouses, and there, the extent of the calamity, that is to say the spread of the fire, was mainly due to neglect of precautionary measures. We hear that the warehouse district with the exception of these Royal Storehouses, which have now been rebuilt, is very much behind the times as far as fire protection is concerned; and, taking the history of Antwerp fires of recent years, combined with the state of affairs that still reigns, we should not be surprised if this town were some day to be the scene of a far greater calamity. It is perhaps one of the worst features of Antwerp building that some of the structures are among the most dangerous.

Hotel
Darlington
Collapsing.
New York.

DISCUSSION on the paper read in April last by Parsons before the American Society of Civil Engineers has brought forward a number of useful expressions of opinion by various well-known American engineers. It may be remembered that the Hotel Darlington was a twelve-story building constructed on the "cage" system, in which all the weight is carried by the columns, these being cast iron. Although cast iron is by no means to be recommended for the columns of a high building, the failure does not in itself prove anything against the material. Imperfect design and poor workmanship were responsible for the disaster. The columns were not designed with due regard to eccentric loading, bracing for wind strains and for stresses due to the use of hoisting machinery. In the absence of the metal in the flanges of the columns was honeycombed, and the bolting was both loose and inadequate. The New York Building Code is in many respects good, but it is a somewhat difficult matter to draft laws so as to cover every contingency, and the Darlington mishap has demonstrated the existence of several weak points in the code. The chief lesson it teaches is the folly of permitting buildings to be erected without intelligent supervision, and the great weakness of the New York code is that it provides no means of compelling the employment of competent professional aid. Perhaps the best criticism of the code is that it "pretends too much to engineering," and has led unqualified persons into the practice of "designing according to law." By making provisions of a general character with safeguards none but properly qualified men will be able to undertake important works, upon which the safety of the community rests. The position in New York can scarcely be considered satisfactory at the present time, especially in view of the remark made by a prominent American engineer that "many buildings in this city are in danger of collapse at any moment." On the whole we prefer what are sometimes called "obsolete British methods."

Wireless
Telegraphy.

THE theory of wireless telegraphy has been considerably advanced by the publication of Hertzian Waves, by Professor Lodge of Oxford, which has just been published in the *Proceedings of the Royal Society*. Hertz, who was the first to detect the electro-magnetic waves in 1887,

er, which Maxwell had predicted, also worked out Maxwell's equations and drew curves showing the propagation of the waves. Professor Love redraws some of these diagrams, and shows that they are to be modified very considerably. One of his results is that Hertzian waves can only exist when there is a magnetic and electrostatic field across which they can travel. For example, radio waves are transmitted across the Atlantic, Faraday's lines of electric and magnetic force must previously exist between the receiver and the transmitter. The oscillations are set up at the spark of the transmitter electrostatic lines of force are broken off, forming closed loops, which push aside the existing lines of force as they expand outwards with the velocity of light. Professor Love has drawn very clear diagrams of wave disturbance in the ether, showing how the loops come into existence and the shapes they assume as they expand. The arithmetical calculations involved in drawing the curves must have been a very tedious, but the result is worthy of the labour, for, to practical men as well as scientists, Professor Love's results are of the greatest value, and a study of them will show the reason why it is necessary to connect some cases to earth the antennae of the receiver and the transmitter, and in other cases this is unnecessary. It is interesting to note that all Professor Love's results are deduced from Maxwell's mathematical equations.

The Preservation of Timber.
SOME notes on the preservation of timber, presented by Mr. J. R. Baterden, at a meeting of the Newcastle-on-Tyne Association of Students of the Institution of Civil Engineers, are of interest to our readers, although primarily relating to timber used in engineering works. It is well known that most kinds of wood, if well seasoned and properly protected, will last for centuries. For instance, household furniture and timber used in the ground last almost indefinitely, and engineering structures, such as timber quays in water free from marine worms, will remain in good condition for fifty years or more. The author points out that decay is most likely to commence in those portions of structures which are affected by variations of weather and temperature—sometimes dry, sometimes wet—and in places where there is no current of air. Decking, where dirt lies along the joints and keeps the timber moist, is of more than ten years can scarcely be expected. This is accounted for by the fact that moisture encourages fermentation of the sap, a process that is retarded by warmth. Hence the exclusion of humidity should be the first care of all who use timber, and the second is to adopt means for preventing the process of fermentation. Although demanding a good deal of attention to seasoned timber, Mr. Baterden makes some interesting notes on other forms of naturally treated wood, referring in detail to the "Haskinizing" process. This form of treatment has the advantage that it does not involve the extraction of sap, but is based upon the solidification of the natural constituents of the

material, while destroying the germinative principle inherent in the sap, and sterilising all forms of organic life.

Cement Construction in Canada.
A NOTICEABLE feature in connexion with building operations in Canada is the extensive use made of cement and concrete. In Toronto it is now the usual practice to construct the entire foundations of private residences of concrete, and the same material is largely employed in building vaults, bridges, and other structures. In the Exhibition Park, Toronto, several buildings have been erected of hollow concrete blocks, which lend themselves to suitable architectural treatment and ensure solidity of construction. Concrete has also been employed in building many large grain elevators, and for the formation of foot-walks in cities, towns, villages and hamlets throughout the country. For water reservoirs and cisterns, sewers, and even coffins and burial vaults, concrete is largely used by the Canadians; but concrete-steel construction appears to have made little headway in the country up to the present time. Considering the rapidly extending adoption of the new material in the United States, this backwardness on the adjoining country is somewhat surprising.

Barnet Hospital Competition.
AS WILL be seen under the head of "Competitions," the Barnet Isolation Hospital Committee, to whose proceedings reference has been made more than once in our columns, have made their awards in this competition, having persisted in their refusal to appoint a professional assessor. The long discussion on the subject, as reported in the *Barnet Times*, shows how much they needed professional advice, both to assist their very confused ideas as to what was to be the next step, and also to instil into them some notion of their duties towards competing architects, as may be gathered from the remarks of the Chairman, to the effect that if the Local Government Board and the County Council did not pass the plans, their duty would be to take up some other plan or set of plans; "but they were not bound to either Nos. 46 or 28" (the plans placed second and third) "or any other number in the list of over 50 sent in. They would be left with a perfectly free hand, and could select any which were sent of the 50 odd, or choose from any other source outside the competition." That is to say, the "over fifty" architects who had competed would be thrown over *en masse*, and their whole labour and chances wasted. If that is the Committee's idea of the way to treat competitors, no wonder they did not want to be bridled by an assessor, who would not have left them this kind of "perfectly free hand."

Bewell Public Library Competition.
Two or three weeks ago we commented on the unsatisfactory nature of this competition, in which pretty large premiums were offered, but with merely the bald statement that "the successful plans would become the property of the council," nothing being said of an assessor; and we indicated that it was probably a competition to be avoided.

Our suspicions seem to have been more than justified. From a cutting that has been sent to us from a local paper, it appears that one of the members of the council has openly expressed himself as to the object of the advertisement:—
"Our plan is to get a good set of plans, and after assuring ourselves that they were all in order and the measurements correct, we could engage a clever clerk of works, who would see the work carried through according to these plans. Thus we would save all the architect's fees, which is a heavy item, and the work would be as well done as though we had an architect supervising."

That is not unfrequently the real object in advertising a competition, but we never saw it expressed with such cynical frankness before. The council may depend upon it that not a single architect of position or merit will respond to such an invitation.

Houses of Historical Interest: London.
IN furtherance of the movement for distinguishing the homes of eminent men and women, the Duke of Bedford has caused tablets of bronze, with suitable inscriptions, to be affixed upon the fronts of No. 65, Russell-square, and No. 11, Bedford-square—occupied respectively by Sir Thomas Lawrence, P.R.A., during the twenty-five years that preceded his death in 1830, and Henry Cavendish, investigator of chemical and natural science, and the first to calculate the mean density of the earth. A memorial tablet has recently been set up at No. 14, York-place, Baker-street, where Pitt resided in the interval 1803-4, during the Premiership of Addington, and which he quitted to resume the seals of office for the last time. A similar record will be made in respect of No. 6, Frith-street, Soho, where William Hazlitt died, Charles Lamb being in the room, on September 18, 1830; of No. 48, Welbeck-street, Marylebone, the home of Thomas Young, M.D., who rivalled Champollion in his elucidations of the ancient language and hieroglyphics of the Egyptians, discovered the interference of light, and expounded, in 1804, the theory of capillary attraction; and of No. 34, Gloucester-square, Bayswater, where lived George Stephenson.

The Photographic Salon.
THE twelfth Annual Exhibition of the Photographic Salon, at the Dudley Gallery, if it no more convinces us than its predecessors that photography is an "art" in the same sense as painting, serves to show what a number of different kinds of effects can be obtained by the judicious photographer. "Winter's Mantle" by Mr. Gleason (11), and "Road to the Old Farn," by Mr. Mitchell Elliott (12), show what delicate snow effects photography can give; while Mr. Steichen, in "The Big Cloud" (116), produces a most powerful effect with the representation of a large cumulous cloud over the horizon of a nearly black moor-land; but a painter would have got the same effect without losing so much of the detail of the foreground and middle distance. The same photographer exhibits a life-size head of G. F. Watts, with the Rembrandt-ish effect of strong light and shadow of which Mrs. Cameron set the first example in photographic portraiture. Mr. G. Davison's "Early Morning at Aele" (69), is most happily arranged in regard to pictorial composition; and Mr. H. Wild, in his

little afternoon scene on a sea-beach, "November" (207) has produced a poetic effect of declining day. We have so often spoken of the neglect of architecture in photographic exhibitions, that we must specially notice and approve the five small but well-selected and clearly executed small photographs of architectural subjects by Mr. Frederick H. Evans. This is a class of subject to which photography is particularly well adapted, and in which it is most valuable; and we hope to see more of Mr. Evans's work of this kind. There are two or three attempts at using photography for nude studies, removing them from realism either by a special tint in imitation of crayon, as in Mr. Le Bègue's "Sanguine," or by throwing them partly into shadow, as in "The Toilette of Gabrielle," by Messrs. Haweis and Coles; but considerations of decorum must always stand in the way of any extensive use of photography in this class of subject, except in the matter of life studies for the use of painters, which of course are not things for exhibition. That is another point in the superiority of painting over photography; a painter treats the nude figure conventionally; photography only treats it realistically.

It appears that two Frenchmen, Dr. Pellegrin and M. E. Petit (an architect), have proposed a system of building houses on turning platforms, so that questions of aspect and prospect can be settled at the

will of the owner. The platform is to be moved by the agency of a gas or oil engine. It is a scheme which obviously could only be applied to houses of small size, and must have many drawbacks even in that case; and belongs in fact to the type of human operations which may be irreverently classified as "fads."

NOTES AND SKETCHES IN SOUTHERN ITALY.—III.

SAN CLEMENTE IN CASAURIA.

The church of S. Clemente in Casauria is practically all that now remains of an abbey which was at one time celebrated and rich. It stands at a distance of a few kilometres from the little village of Torre de' Passeri, which takes its name from a tower from the summit of which a light was displayed to guide travellers in crossing the river Pescara, the ancient Aternus, which is near (Torre dei passi, Turris passuum). At one time the river divided into several arms and thus made the land upon which the abbey was founded an island, and that there are and were times when the fording of the river was dangerous is proved by the present condition of the pretty winding ravine down which the river runs. There was a lofty bridge by which the road crossed the river at a considerable height. This was broken down by the stream some time ago, long enough for the sloping roadway which led down to it to have been cultivated as a garden, and great masses of wall as large as the side of an ordinary house lie in the stream, testifying to its power when raging in flood. A slab which lies in front of the church bears part of an inscription recording the repair of a bridge near here in Roman times, and fragments which appear to have belonged to it are scattered here and there, which proves that the river had a bad reputation long before it drowned Sforza Attendolo at the ford nearest the sea. The Roman settlement was called Interpromium, and

in the atrium in front of the great west is a decayed inscription which records certain citizens of Sulmona had reconstructed the "ponderarium" of the village or district of Interpromium which had been cast down by an earthquake. In the time of Lucretius, in 1786, the inscription was more easily legible and he gives it as follows:—

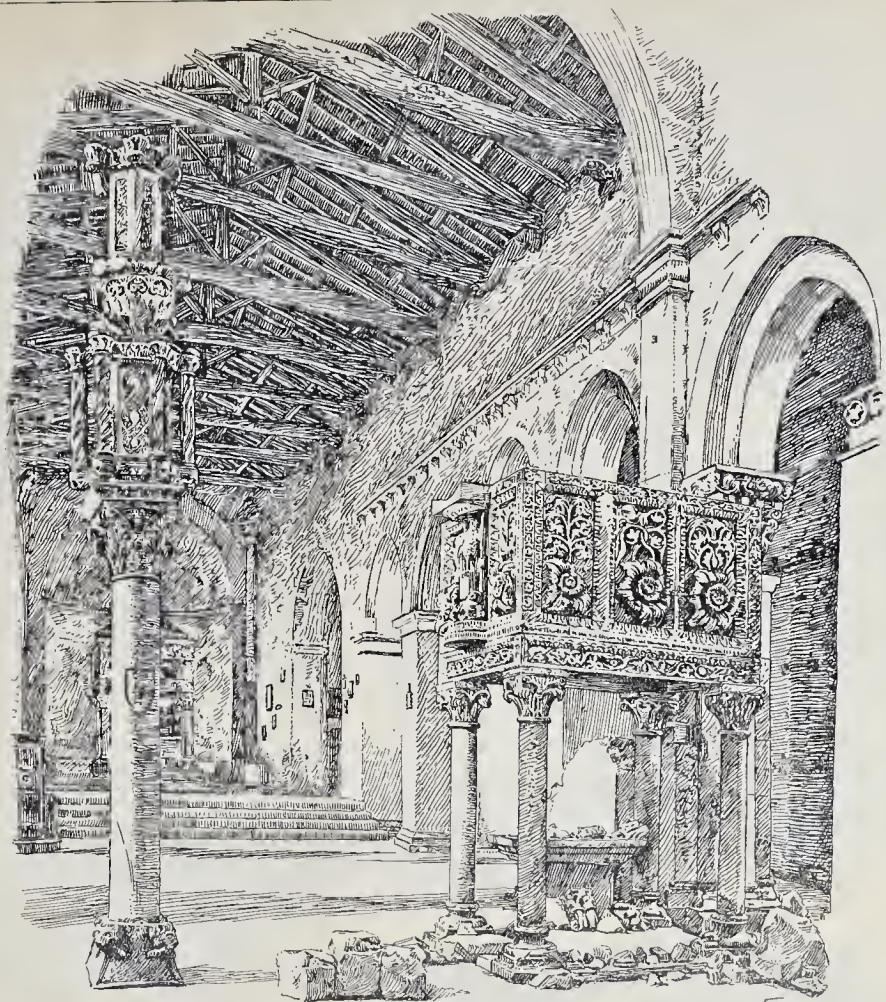
cives Sulmonii, Primum, et Fortunatus huc Ponderarium, Pagi Interpromini vi Terremotus, Dilapsum, a solo Sna, pecunia, restituerunt.

To the left of the atrium or porch is a wall which was once vaulted, but is now open to sky and filled with antique fragments, beneath which a rank growth of weeds has sprung. Here are fragmentary inscriptions, statues, altars, and various portions of architectural ornaments. Walls were built at some distance across the room dividing the space, and are mainly formed of architectural fragments. In one of them bits of a mosaic pavement have been seen, and many portions of inscriptions, sometimes a few disjointed letters, sometimes whole words. Here are also stored a many pieces of Romanesque and medieval carving—caps, portions of a small rose window, etc.

The church had a Benedictine monastery attached to it which was founded by Emperor Lewis II. in 871 in thanksgiving for the driving of the Saracens out of Italy, the island called Casauria," so that the monastery preceded the monastery and had nothing to do with its riches or splendour. In 872 he obtained the bones of S. Clement, who was thought to be able to save those who fell into the Pescara and were drowning, since he had been drowned for his belief in Christ, and deposited the church which was then dedicated to Holy Trinity. They were brought from Rome attested by various miraculous occurrences placed before the high altar on May 27 certain Audegado ceded much of his property to the monks for the building of the monastery and in 874 it is referred to by Count Eriberto



S. Clemente in Casauria: West End.



S. Clemente in Casauria: Interior.

lt. The Emperor largely endowed the monastery and gave the abbots the right to use imperial sceptre instead of pastoral staff, holding it in the right hand, which Ughelli takes as a unique concession. The first abbot was named Rommo, priest and monk of the church and monastery of S. Mauro on the hill of Amiterus. Of this IXth century church nothing remains but the crypt. The twelve columns which support the vaults are antique, one of them fluted and very dwarf. The caps of the four which support the apse vault are Corinthian. A piece of the original pavement has been found, and shows that the crypt was never any loftier. In the apse is a rough stone altar on a pedestal, round the walls remains of a bench, and on the plastered vault rough scrolls of dark green with spots of a brown low looking like twirling serpents. It has five small naves vaulted with quadripartite vaulting, and is approached by two narrow stairs. In 920 the monastery was sacked by the Saracens. The monks approached Berengar, who gave them the power to elect an abbot, but the rebuilding took fifty years, and appears to have exhausted their resources, for in 1025 Abbot Guido found the place in a deplorable state. He obtained many privileges and grants from the Emperors Conrad and Hugo, and dying in 1045, left the monastery much better. Five years later Abbot Domenico for the first time asked the Roman pontiff for a "privilegium" against bishops, archbishops, counts, barons, and all those who wished to have power in the monastery. Leo IX. was

then returning from his unfortunate expedition against the Normans, and subsequent history shows that the "privilegium" was of very little avail against them. In 1074 Abbot Trasmondo fortified the "Castello" outside, also renewed the church of S. Pelino, and commenced to restore that of S. Panfilo in Sulmona. "Not content with the humility of the former church built by the Emperor Lewis, he built a new church in the place which is still called 'ad sanctos novos,' to which he obliged the congregations to move, wishing, if he had time and God willed it, to transfer the blessed Clement there." Between 1076 and 1079 the Norman Count Malmazetto put Trasmondo in prison and sacked the church and monastery, and when he came out he retired to his bishopric of S. Pelino, where he died and was buried, the monastery remaining waste. Malmazetto at last was imprisoned by the Lord of Prezza, and died in 1097. He was buried in the crypt. Abbot Grimoald obtained from Urban II. the pastoral staff in lieu of the imperial sceptre. He commenced the restoration of the buildings. Under Paschal II., successor to Urban, in 1104, a cardinal named Agostino had the tomb opened to see whether the monastery really possessed the body of S. Clement, and a body was found with a descriptive inscription in letters of gold. Grimoald made the altar, and the body was put into it, and it was sealed with lead and with iron, being dedicated in 1105. A small piece of the body was retained and placed in a reliquary. The great authority for the history of the abbey is the "Chronicon

Casauriense" now in the Bibliothèque Nationale in Paris, which was composed by the monk Berardus and written by a Magister Rusticus at the end of the XIIth century. The glory of the monastery culminated under Abbot Leonato, who was elected in 1155 and built the atrium in 1176. After his death and that of his successor, Abbot Joel, to whom the fine bronze doors are due, it began to decay.

The high altar stands under a baldacchino of stucco on four columns, which appear to be early XIVth century, raised on two steps. It is a Christian sarcophagus of the IVth or early Vth century, and through a hole the IIIrd century tomb of Greek marble, carved with floral ornament, can be seen, which is no doubt the one placed in the altar in 1104. On the top step is an inscription in Roman letters of the XVth century, probably a copy of the earlier inscription. It runs:—

Hic requiescit
Sanctus Clemens S. Petri Discipulus
Et a B. Petro secundus
qui jussu Trajani Imperatoris
Ancora ad ejus collum ligata
tuit in pelago demersus.

The sarcophagus was partially cleared of the cement which overlaid it by Sig. Calore, who has charge of the building, and under whose careful eye investigations and excavations are proceeding. It has three subjects in front with wavy flutings between. The central subject shows an "orante" sustained by two angels. The base of the Easter candlestick

is probably early, a detached inscription gives a date, 1202, and name, Magister Berardus, "ocopus fierifici." The church was damaged by earthquake in 1348, and the present candlestick was put upon the old base when other restorations were effected. It consists of a column of the stone of Pesco Sansonesco, with an elegant cap of Gothic foliage, which bears upon its abacus (which is decorated with a band of mosaic) an hexagonal prism crowned by six spiral colonnettes. On the prism are Cosmati inlays. Above the colonnettes is another cap and another imperfect prism above. At S. Maria d'Ara Bona there is a somewhat similar candlestick. There is a long inscription on the base of the upper part of the ambo, which is strange in design, showing great vigour of projection in the details. At the end of the inscription the name of the sculptor occurs, "Frater ergo Jacobus tibi martir supplicio Clemens. Istud opus recepit atque mihi soli Clemens. A. Pop. +." Probably he was of Popoli. He may also have worked on the facade. The ambo at S. Felino is probably also his, being much like this. The church is a Latin cross in plan, nearly 150 ft. long, and about 63 ft. broad in the transepts and 50 ft. in the nave. There are eight pointed arches with piers, the piers level with the large arch. The nave is of the full height only above these, and is built of a fine local stone called "pietra gentile," from Valle S. Maria, near Pesco Sansonesco. On the outside this higher part has three round-arched splayed windows on each side; a string runs round them at a little distance and unites them horizontally. Colonnettes rise from the springing of this arch, dividing the wall into equal spaces, and a crowning cornice of little arches and a dentilled string above is so arranged that three rest on corbels between each couple of columns. The arches are pointed, and a rosette is beneath each. The apse has the same kind of arcading, but with round arches, of which the colonnettes enclose two instead of three; in the centre are six corbels above a square-headed moulded window, with the usual Apulian beasts on corbels below it. The outside of the crypt shows a small pointed window flanked by two circular discs in high mouldings, and others in the flat wall. Abbot Leonato's wall is outside the ancient wall of the crypt, and has therefore closed the other original windows. The windows at the end of the aisles are round-headed, and have projecting hood moulds,

with columns and caps. After the earthquake of 1348 they built a great arch and wall to close the high nave, and in the XVth century the present bell-tower was built to replace the ruined ancient sacristy and campanile.

The general design of the atrium is shown in the drawings. It appears probable that there was once an oratory over it, converted into cells at a later date. The square windows appear to be XIIIth century. Probably the whole was altered after the XIVth century earthquake with old material. Only one of the lions which supported the columns remains, the other vanished during some badly-managed restorations before Sig. Calore came into power. On one of the caps may be seen the abbatial sceptre, and above it the symbols of the four Evangelists. Those of the central arch bear the figures of the twelve apostles; above, on the curve of the arch, are several figures with inscribed scrolls—Rex Salomon, Sanctus Clemens, an angel, and Rex David. A pointed arch cornice runs beneath the windows. The vaulting arches to the church and the arches above the doors are slightly horseshoe in shape. On the architrave of the central door is the history of the foundation of the church and monastery and the translation of the relics of S. Clement, and in the lunette S. Clement enthroned, with SS. Phœbus and Cornelius on the right and Abbot Leonato on the left holding a model of the church; rosettes and leaves like the ambo fill the corners. Above the left door is a relief of S. Michael, with the dragon on a square stone inserted; on the right is a Virgin and child, copied from a Byzantine original and inscribed *MP ΘΥ*. On the jambs of the central door are figures beneath canopies, very French in style; and on the outside of the apse is a capital with vine leaves studied from nature. Sig. Calore believes that French workmen were employed and compares the church with S. Benoit-sur-Loire, and the XIIIth century Provençal churches.

The bronze doors are very interesting, though not so early as others of the same type elsewhere in South Italy. They were probably made for Abbot Joel in 1191. There are seventy-two square panels, with bands between and rosettes. The panels were inlaid in patterns with gold, which, of course, has vanished. The top row shows four figures of abbots, with rosettes in the corner panels outside them. Beneath these rosettes are a series of three-

towered castles, with a list of the places to which the abbey had jurisdiction, which read to the bottom row. The other panels are filled with interlacing figures, rosettes, circles, a crescent moon with a star over, and another with a cross, both in circles. In the fourth row from the ground the handles occur, twisted and held in fliers' mouths. Oriental influence appears strongly in details both of ornament and subject, but one of figures is inscribed Abbot Joel, and since Rd. of Melfi made the doors of the tomb of Edmond at Canosa, near the beginning of the century, which also show Oriental influence very strongly, there seems no reason for supposing that they are not the work of Italians.

F. H. A.

AN ULTRA-MODERN GERMAN VILLA.

This illustration of a villa built at Tirkirchen, near Munich, from the designs of Munich architect, Herr Rank, is reproduced from a recent illustration in the *Architectonische Rundschau*. It is an example of curious forms of development of modern German taste in domestic architecture, and give also the plan.

THE ARCHITECTURAL ASSOCIATION VISIT TO KETTERING DISTRICT.

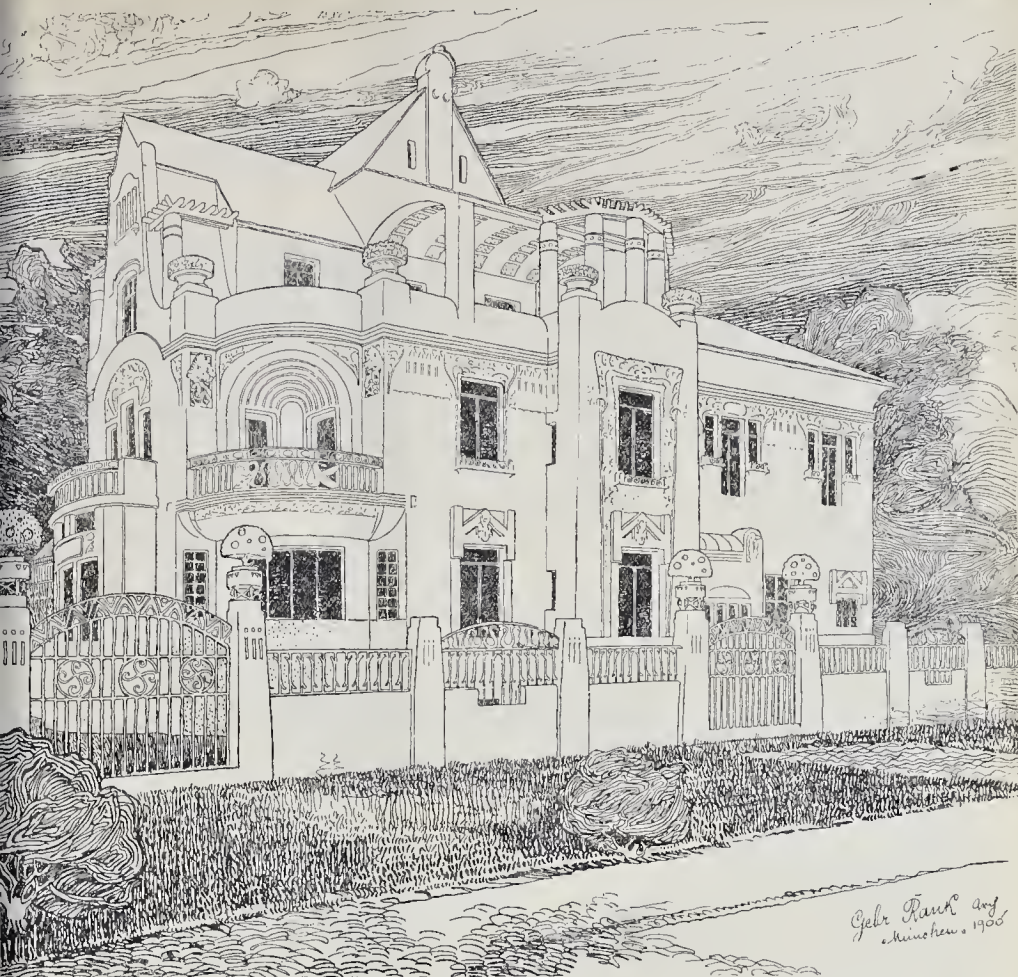
The sixth and last visit of the summer series of visits was made, for the week-end, to the interesting district around Kettering, on Friday, the 16th inst., to the following Monday morning, and was well attended, particularly by the photographers of the Association. Meeting at St. Pancras, the party left at 5.45 p.m. and found comfortable quarters awaiting them at the Royal Hotel, Kettering.

On Saturday morning, the 17th, in glorious sunshine, the party left for a long round, personally conducted by Mr. J. A. Gatch of Kettering, whose unequalled knowledge of the building of Northamptonshire, and whose valuable assistance in the preparation of the programme were placed at the service of the members. Passing *en route* the interesting church of Barton Seagrave, with its Norman doorway and remains of the early church, we reached Islip. This charming Perpendicular church, dedicated to St. Nicholas, is remarkable for good proportions and tall, elegant spire, and the peculiar plan of the piers of its nave arcade—a narrow strip of masonry placed axial north and south, and having engaged column east and west of it to support the group of mouldings of the arches. This peculiarity is seen repeated in several neighbouring churches; evidently a local type of masonry executed at this period. A mural tablet, on the southern wall of the tower, to the memory of Dame Mary, wife of Sir J. Washington (d. 1624), proved interesting. Other features worth notice were the octagonal font and the stoup inside the south door.

A short drive of two miles brought us to the village of Lowick, the church of St. Peter receiving our attention, chiefly for its Perpendicular lantern tower, at the west end of the church, and its old glass, with the monument of the XVth century. The octagonal lantern, with its group of twelve pinnacles, each crowned with a weather vane, is carried on the thick walls of the square tower, small squinch serving to carry the canted sides. The sedilia both of the chancel and the chapel north of the chancel, were good specimens of the style. But the interest here centred more particularly on the fine tombs (1) of Ralph Greene, 1411, with its alabaster effigies of himself and his wife Katherine, and (2) of Edward Stafford, Earl of Wiltshire, 1499, in the south chapel (of Our Lady). The former lies between the chancel and chancel aisle, and the figure of the Lord of Drayton is in armour, grasping the hand of his wife, the head-dress of the female figure being the rich but exaggerated mode of dressing the coiffure which obtained at the period. The beautiful work in the canopies heads of this tomb, with the band of angel figures in niches surrounding the tomb below, forms a delightful specimen of early XVth century carving. Fortunately the indenture entered into between the employer and her masons is still in existence, and relates how the widow Katherine, retained two "kervers"—to wit, Thos. Prentys and Robt. Sutton—to execute before the feast of "Pasques," anno 1420, "bein honestement et profitablement," the



S. Clemente in Casavria: Interior of Atrium.



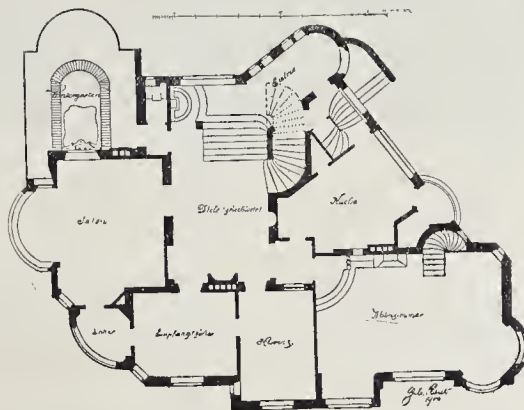
Villa, Thalkirchen, near Munich. Herr Rank, Architect. (From the "Architektonische Rundschau.")

ptuous tomb of alabaster, and find the
erial, for the sum of 40l. sterling.
the other tomb, of the Earl of Wiltshire,
died in the closing year of the XVIIth
ury, is also a very beautiful and rich piece
ork. The marginal inscription, with its
scrolls dividing the words, is a remarkable
e of lettering, worthy of the most careful
rd. The sides of the feet of the effigy are
ported by two small and quaintly-carved
ces of kneeling monks. A third tomb, a
slab with brasses let into it, is that of
ary Greene, of a date intermediate between
ie above mentioned, 1467, and shows us
figure clothed in a tabard. The north
a has some very fine and rich stained glass
he upper half of each window (the lower
ig plain), and dating perhaps a century
er than the windows in which they are
red.

he inexorable summons from the whipper in
he party bore us away from this most interest-
structure, to repair for refreshment to the
telry of the White Horse, and immediately
r to proceed to Drayton Manor, lying in the
k quite near (the seat of Mrs. Stopford
kville), where the party was hospitably
died, and after a conducted survey of the
misses, left to wander at will. It was here
had the benefit of Mr. Gotch's antiquarian
arch, and a plan he had prepared, chron-
ologically coloured, served to elucidate the
ory of the house. Once a manor, seized
n the Saxon owner by the greedy conqueror,
passed to the De Veres in the time of
ry II., the first Earl of Oxford (Aubrey)
ag, we know, its owner; and it remained

with the De Veres till one Sir Walter took to
himself the name of Drayton, in the reign of
Richard I. His descendant, Sir Simon de
Drayton, received, 1328, a licence to crenellate,
and proceeded to erect the house with enclosed
forecourt, that we now see, much altered
indeed, but easily traceable. Walpole wrote
to his friend Montague in 1763:—"The front

is a brave, strong castle wall, embattled and
loopholed for defence, . . . the mansion
all towers and turrets, . . . not a rag
in it under forty, fifty, or a thousand years old."
The great hall, the solar adjoining, and the
front buildings were Simon's work, and it was
interesting to know that the old roof of the
hall is still preserved intact, but invisible,



Villa, Thalkirchen. Plan.

because of the plaster ceiling inserted at a lower level.

Henry Greene, in 1450 (he was afterwards the Earl whose tomb we had seen at Lowick), altered, and indeed, rebuilt the greater part of the house, and no more was apparently done till in 1584 it was again enlarged by Lewis, third baron (1572-1601), and this Elizabethan work is perhaps the best portion of the house. John Thorp is said to have been entrusted with the execution of his scheme. This comprised the entire north-east wing, with its vaulted cellars, the two wings of the courtyard, and the front overlooking the pleasure. When Lady Mary Mordaunt married the Duke of Norfolk, much improvement was done, and we see the magnificent ironwork of *cir.* 1700, in gates, railings, and grilles, bearing her cypher. Tizon was then in his prime, and although no connexion with him can be traced, probably his craftsmen executed some of the work. Then it was that the interior of the hall was remodelled; the façade of the courtyard added, and the front portion improved. Lady Mary's second husband was Sir John Germain, who came over with William III., and has left us the magnificent gardens, with their terraces, ponds, balustrades and lead vases, as well as the colonnades of the forecourt. The present owner has done much to restore the beauties of the place, and everywhere is her loving care apparent. We left with much regret, time being short, and pushed on to Weekley Rise, for a pleasant rest in Mr. Gotch's delightful garden. After tea, the party proceeded by the fields to see the church of St. Mary, Weekley, and the almshouse, or Montague Hospital. The church is decorated, containing an effigy tomb of Lord Chief Justice Montague, who died in 1556, the father of the Sir Edward who founded the almshouse, dated 1611, with its quaint motto:—"What thou doest do yt in fayth," and the hexameter from Ovid' below the sundial, "Tempora labuntur tacitissime senescimus annis" ("Time flows, and we grow old tho' silent years"). The building has a fine doorway and gable over, still in remarkably good repair, but only two occupants remain. When they are gone the charity will presumably lapse.

Immediately adjoining the church and almshouse is the park gate of Boughton, whose ample avenues laid out by John the Planter, afforded a pleasant stroll before reaching the house, owned by the Duke of Buccleuch. It was the first Duke of Montagu, Ralph, who built the house, and incorporated parts of the previous Elizabethan structure, and the second, John (the Planter), who beautified the demesne, enlarged the work of his predecessor, and left us the wings of the large house, one of which is still unfinished. A lengthy perambulation through the state rooms brought to a close the first day's programme, and so back at dusk to our hotel.

Sunday broke even more fine and sunny than the day before, and an early start enabled us to get to Geddington before the hour of service. The village is picturesque, and boasts a good group in its bridge, cross, and church, all in close proximity. The cross is one of the Eleanor crosses, a XIIIth century relic, but differing from the others at Northampton and Waltham, and probably from those formerly at Charing, Cheap, Duustable, Stony Stratford, and Lincoln. But the statues on the Geddington cross are clearly by the same hand as those at Northampton, perhaps by John de la Bataille, the records and accounts of the executors being still extant; but there is no trace of the Geddington one in these. Its peculiarity consists in being triangular in plan, standing on a hexagonal base; and the canopies sheltering the figures are carried on slender shafts in front of the figures, which results in partially concealing the sculpture, to its detriment. These crosses, originally nine in number, were all erected between 1291 and 1294.

Passing on to Stanton, we made a brief survey of the church, which has a well-proportioned spire and a good font, and is linked with a tradition of the surrounding Rockingham forest. Proceeding on our route, we passed the quarries whence is obtained the Weldon stone; their output appears limited, judging from superficial evidence, but it must not be forgotten that from time immemorial has this stone been worked. Kirby Hall and even old St. Paul's being built of it. So also are many Cambridge colleges, St. Dunstan's in Fleet-street, and others. But to the uninitiated let it be said that the Weldon and the Ketton stone are one and the same.

Passing slowly through Great Weldon, the better to observe its little lodge (illustrated in Mr. Gotch's book) and its many interesting houses, we drove along by Deene Park (Lady Cardigan's) to Kirby Hall, where the inexorable official allowed us three brief but busy hours. Its departed magnificence has been often described; its present neglected statelessness cannot be described here. It should be seen and pondered over. Perhaps the unfortunate selection of its site was its condemnation, but in spite of drawbacks, it remained habitable down to 1820.

The mansion, built by "Hunfree Stafford," remains very much as he left it; John Thorpe's plan is still to be seen in the Soane Museum, and on it he records "I layd ye first stone, A^o 1570." It was sold to Sir Christopher Hatton in 1575, the year Stafford died, but circumstances prevented him from viewing his purchase till 1580, and his successor, another Sir Christopher, employed Inigo Jones to add to and beautify the work of Thorpe. His additions were not of an extensive character, only insertions being made to the north and south sides of the quadrangle, a staircase (now destroyed), a gateway in the outer court, the side entrances, and a few other minor features. The terraces, gardens, bridge, even the church, are gone, without more than mere traces and the house itself is rapidly becoming a ruin; but a small amount of timely care will preserve its solitary grandeur for many years.

Our allotted time having run out, and being unable to visit Grettton, which was on our programme, we drove on to the picturesque and charmingly-situated village of Rockingham. The castle was not to be seen on a Sunday, but we obtained a peep of the massive embattled gateway, dating from 1275.

We diverged, on our homeward journey, to Rushton, but the shades of night had fallen ere we reached it; so on to Kettering.

The Association must be congratulated on the success of the visit; a week-end, once in the year, affords good opportunity of both study and social reunion, and when the members have the assistance of such ciceroni as Mr. Gotch, eminent but genial withal, such visits cannot fail of success, the weather always permitting.

Illustrations.

"SCIENCE AND ART": RELIEF.



HIS panel, which was exhibited at the last Royal Academy during the present year, is one of a series of five panels representing the Arts and Crafts, to be placed in the marble staircase leading to the ballroom in the "Grosvenor," Glasgow.

The architect of the building is Mr. Geo. Bell, of Glasgow. The sculptor is Mr. Albert H. Hodge, of London.

COUNTY HALL, NORTHALLERTON.

THIS building is in course of erection for the North Riding of Yorkshire County Council. The design was selected in a limited competition ten years ago, Mr. A. Waterhouse being the assessor. The original plans have been remodelled to meet more recent requirements, and have been designed with a view to future extension.

A feature has been made of the hall and grand staircase leading to the anteroom and council chamber, in which Hopton Wood stone is being largely used. The building is faced with red Leicestershire sand stock bricks and stone from the Hollington quarries, and the roofs are to be covered with thick light-green Westmorland slates.

The contractors are Messrs. J. Howe and Co., West Hartlepool, and the architect is Mr. Walter H. Brerley, of York.

The drawing was hung in this year's Academy.

PENN HOUSE, WESTON, NEAR BATH.

THE designs shown herewith are a scheme for remodelling a house built in the "Italian Villa" fashion about forty years ago.

The existing house stands on sloping ground, with its principal aspects to the south and west. The main entrance is on the east side, and on the north side are the stables, designed by the late Mr. J. M. Brydon.

The scheme of remodelling has been to some extent governed by the plan of the old building,

part of which is to remain, and this has necessitated the position of the hall, which is intended to be top-lit. The walls are of Bath ashlar.

A start has been made with the billiard room wing, and the work is being carried by Messrs. Jacob Long and Sons, of Bath, from the designs and under the superintendence of Mr. Reginald Blomfield, of London.

The drawing was exhibited at the Royal Academy this year.

BLACKWOOD HOUSE, BYFLEET, SURREY.

THIS house is now being built in Den Park, Byfleet. The walls are of brick, and 14 in. thick above the plinth, and covered with cement rough-cast. The roof-tiles are of a pattern to imitate old. The framing of the verandah is of teak.

In the hall the panelling is of basswood, stained and oiled, and this and all the other pieces are being made by Mr. J. White, of Pymble Works, Bedford. The floors of the billiard-room, kitchen, etc., are of wood laid by the Acme Woodblock Flooring Co., Messrs. J. Garrett and Son, Balham, architects, and the architects are Messrs. Sutcliffe and Sutcliffe, London. The illustrations sent to us under the name of Mr. G. L. Sutcliffe, which only was ther-fore attached to the plan.

THE BRITISH FIRE PREVENTION COMMITTEE'S VISIT TO BUDAPEST.

AS ALREADY chronicled, the British Fire Prevention Committee organised a small expedition to attend the Budapest Fire Congress to which the Executive Officers had received an invitation, in return for the hospitality to Hungarian visitors at the Fire Prevention Congress held in London in 1903. The delegation included officers of the National Fire Brigades' Union, representing the Committee, that body, which had received a similar invitation. The Commission numbered ten, and away from England for seventeen days, besides visiting Budapest made several important inspections on the return journey, namely at Vienna, Munich, Nuremberg, Frankfurt, and Cologne.

Of the papers read at Budapest, there were two on the Baltimore fire, of which we already published one by Mr. Ellis Marsden; there were two on Theatre Safety; one on Fire Alarms; one on Mill Protection; and one on the Chemistry of Fire Protection, which might be deemed to be of interest to the British world.

The following were the resolutions adopted out of the discussion of these papers, which should be of interest to architects, and in preparing them we consider that particularly relating to the Mills and Factories should receive the careful attention of the Home Authorities.

RESOLUTIONS.

"Mills and Factories.—1. These should be provided with properly organised private brigades to meet the early stages of an emergency, and these brigades should be officially inspected at regular intervals.

"2. Any fire or alarm of fire in a mill or factory, however slight, should be immediately reported to the local authority, with the view of preventing similar occurrences; and failure to immediately make such a report should be heavily penalised.

"3. The preventive measures against possible outbreak of fire in mills and factories should be increased by a more systematic development of the structural regulations defining watchmen's duties and responsibilities.

"Theatres.—It is absolutely essential that stage scenery and properties be rendered inflammable in a reliable and permanent manner, and that all the constructional parts of a stage be of a fire-resisting character.

"Chemistry of Fire Protection.—The greatest attention should be given to the chemistry of fire protection, in the interests of fire prevention.

"Fire Alarms.—The public authorities should give greater attention to the installation of modern fire alarm systems in the minor urban and rural districts."

Of the above resolutions, those relating to non-inflammability of scenery and the chemistry of Fire Protection in some degree overlap, but we are glad to see that this question of chemistry for the purposes of Fire Prevention was given an important position at the Budapest gathering, for it has been too long neglected with the result that much has not yet been done which might long ago have been accomplished. The Conference was followed by a mee-



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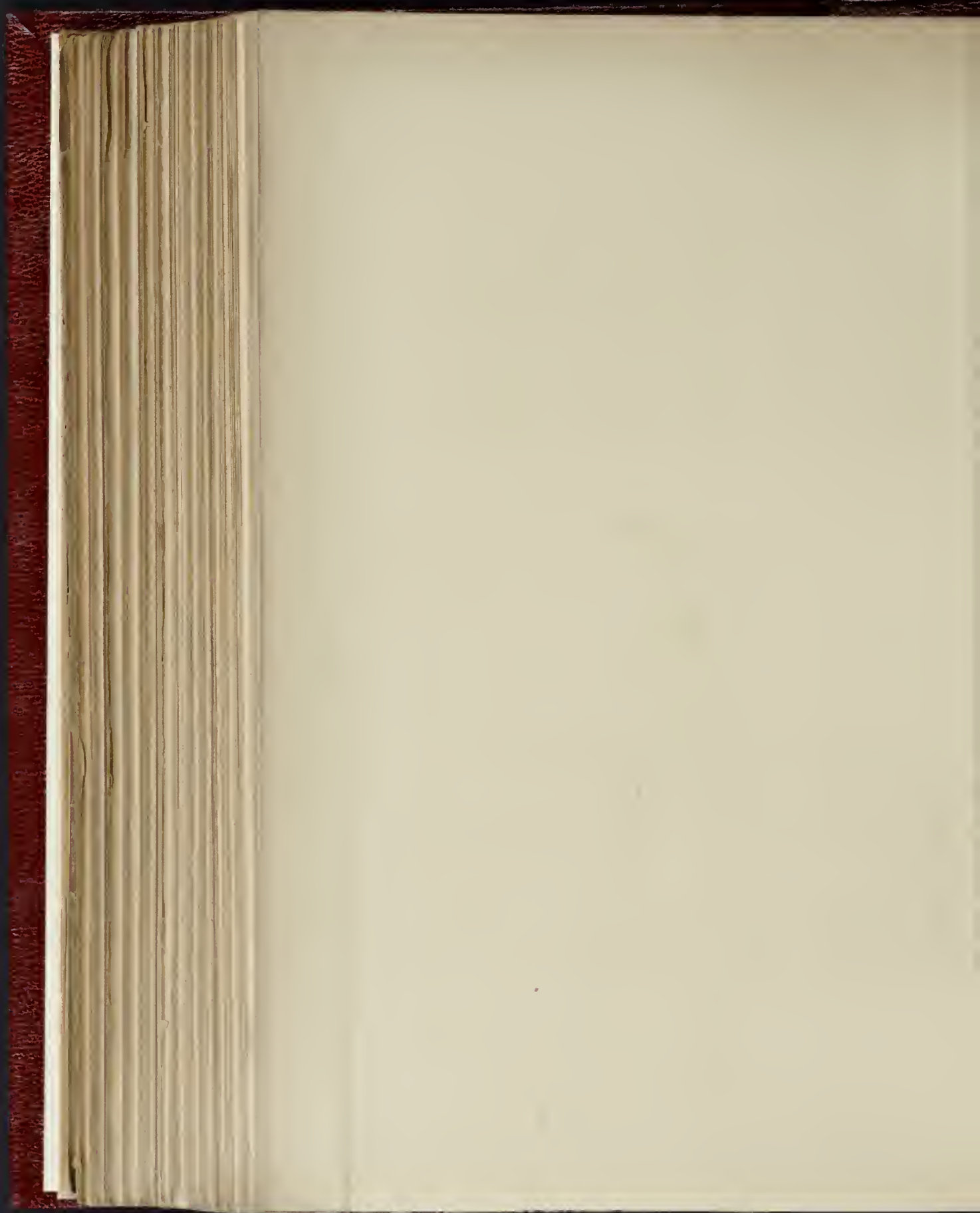
"SCIENCE AND ART". RELIEF.—MR. ALBERT H. HODGE, SCULPTOR.

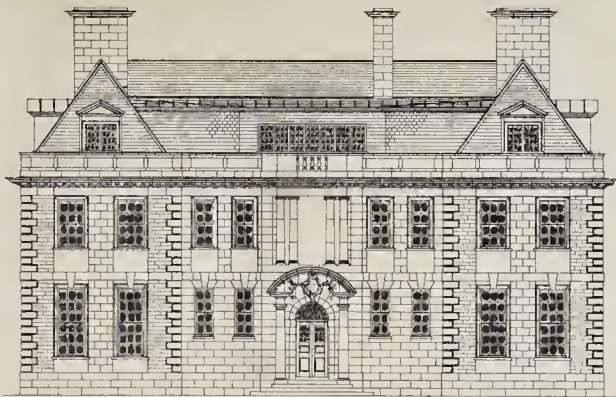


COUNTY HALL
NORTHALLERTON
for
The North Riding
County Council
YORKS
J. G. & J. H. B. Architects



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EAST ELEVATION



FIRST-FLOOR PLAN



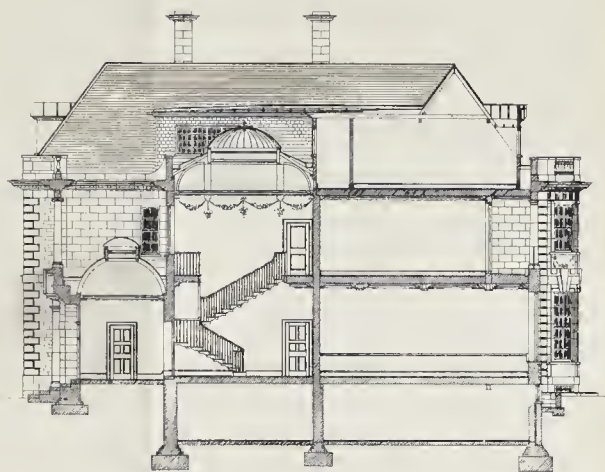
WEST ELEVATION



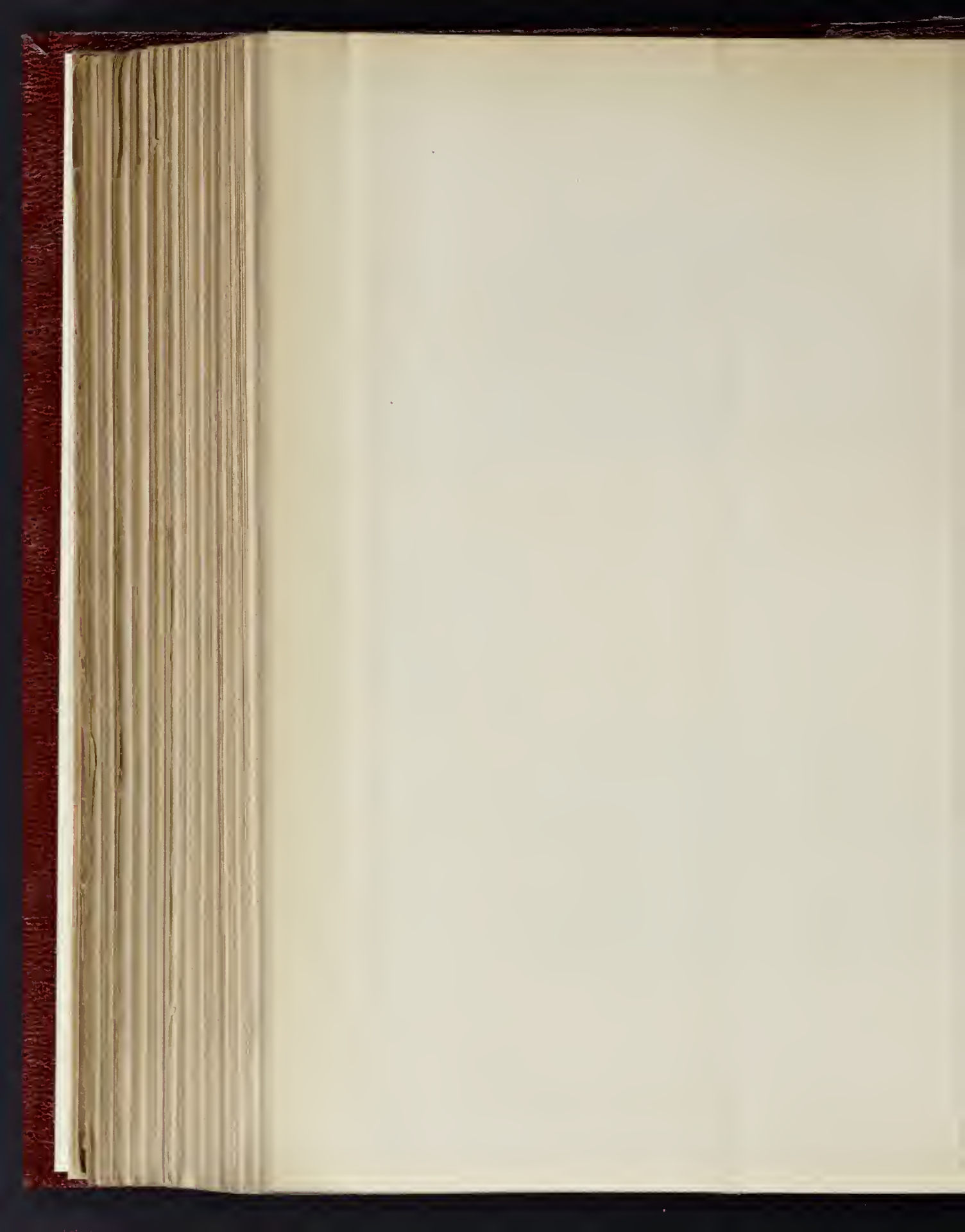
SOUTH ELEVATION



GROUND-FLOOR PLAN



CROSS-SECTION LOOKING SOUTH



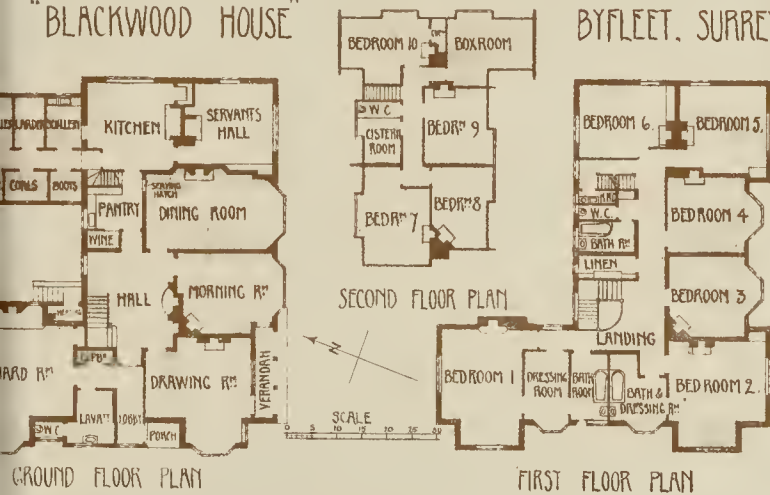


G. L. SUTCLIFFE, 1903.

GARDEN FRONT: SOUTH-EAST

"BLACKWOOD HOUSE"

BYFLEET, SURREY.

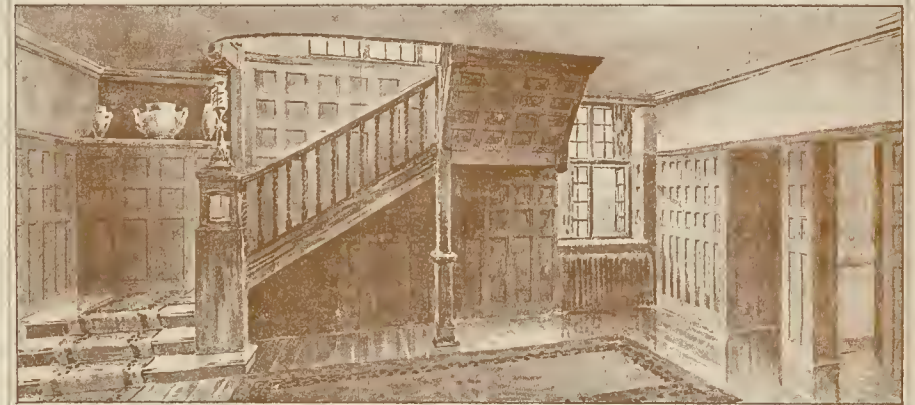


MR G. L. SUTCLIFFE, A.R.I.B.A. ARCHITECT.

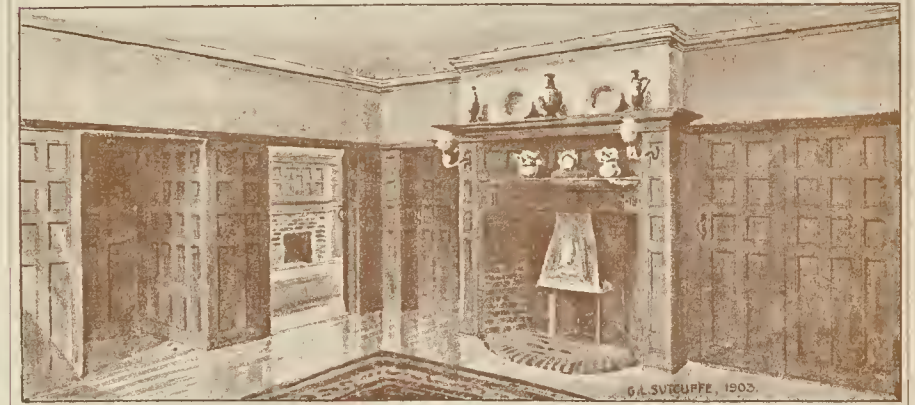
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BILLIARD-ROOM: STAIRCASE: AND: HALL:

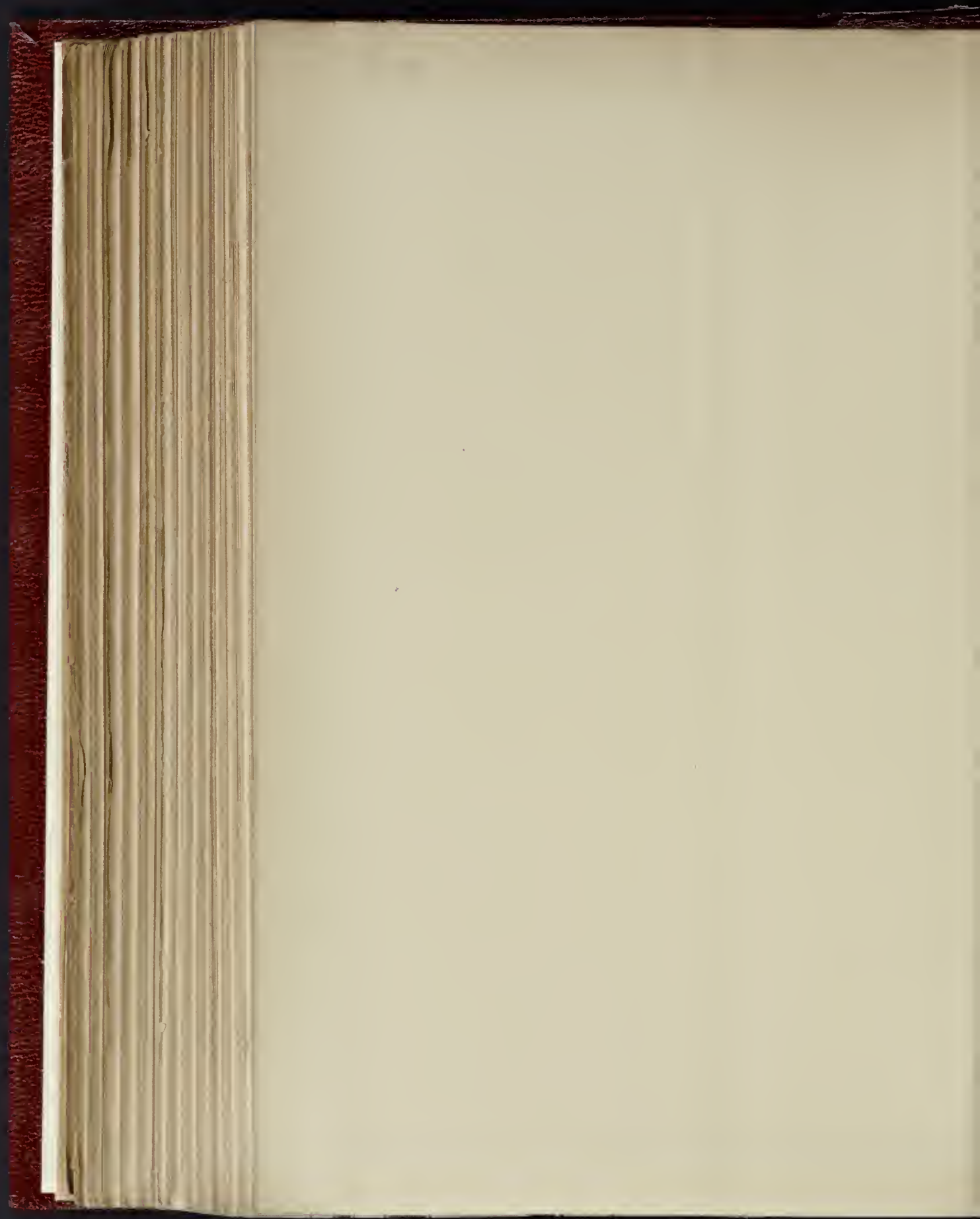


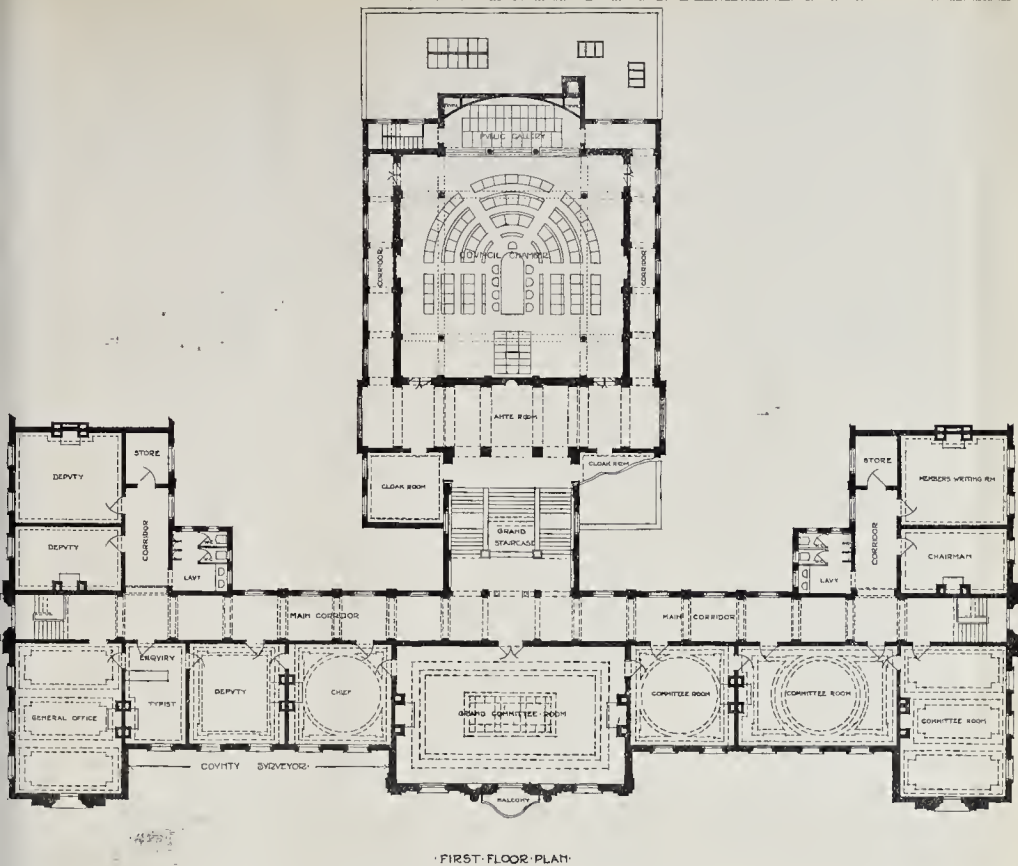
BLACKWOOD HOUSE: BYFLEET: SURREY:



G. L. SUTCLIFFE, 1903.

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FIRST-FLOOR PLAN
County Hall, Northallerton. (See page 316.)

the International Fire Service Council, which Mons. Cazier (France), Mr. Sachs (England), Count Szechenyi (Austria-Hungary), Herr Westphalen (Germany) were elected Presidents for the ensuing first four years. The seat of the Council again fixed at Luxembourg. It will thus be seen that also on the International Fire Service Council the building was duly represented, for besides the English representative being an architect, Herr Westphalen is by profession a building surveyor, and has only of later years become Fire Chief of Hamburg.

Among the work which the Council will probably be taking in hand will be the consideration of an International Fire Service Dictionary, which not only the fire service terms, but any general building terms, may probably be included.

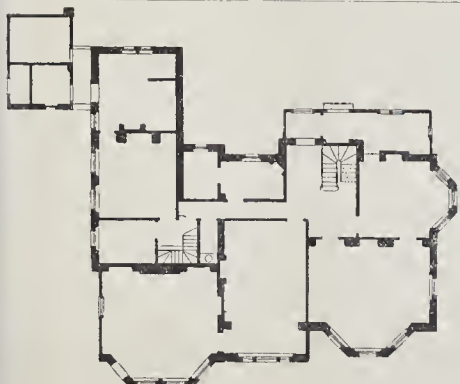
The Commissioners visited the scene of the large store fire at Budapest, and also the flour mills. But perhaps the most important visit at Budapest was the one paid by the Commission to the Royal Opera House, which has the first stage erected on the "Asphaleia" scheme and which is equipped with sprinklers. These sprinklers were put into action for the benefit of the Commissioners, the entire stage being flooded from top to bottom with a complete deluge of water.

As to Budapest generally, the development of the city has been much marked of late years. Innumerable new public buildings have been erected, and their façades are of considerable architectural importance. The new Royal Palace at Buda is now complete, and is also a very fine example of its class.

At Vienna, those members of the Commission

who had visited it before did not find any very great progress in the development of that city during the last ten years; but such of the new buildings as were being put up are certainly of very substantial character, and all showed a full appreciation of the value of a good architectural frontage. From the Commissioners' point of view, the visit to the new Gerngross Stores, which were in the course of completion, and to the Court Theatre were probably the principal events. The Fire Brigade is undoubtedly a splendid one, but it lacks well-built stations.

At Munich the Commissioners certainly saw a great deal that was new and of first-class character. The new retail stores in course of erection there, for Messrs. Emden and Messrs. Tietz, were buildings of high order, carefully designed, well and rapidly constructed, and unique of their kind. They were of considerable



Penn House: Plan and Elevation previous to the Alterations. (See page 316.)

architectural pretensions, and the architect's design had been well conceived and executed. The architect of both these places is Prof. Littman, who was also the architect of the new Regent Theatre, which is situated outside the town proper, and which was visited by the Commission. The large new fire station was also of considerable architectural merit, and far above the average of this class of building.

At Frankfurt the party visited the new stores of Messrs. Schmoller. This, although still in the builders' hands, was in full working order, and very clearly showed the whole principles on which the stores are now laid out. It is obviously wise that these buildings are dealt with abroad under separate or special regulations by the local authorities, both as to building and maintenance. The fire risk of these buildings is enhanced by the enormous cubic extent occupied without due separation into individual risks. The new Municipal buildings were structures calling for the comment of the Commission, as also a number of the new public buildings, such as the post-office.

At Cologne there was seen an excellently built fire station, most carefully planned, and very charmingly though simply decorated. There was also the usual new store building (belonging to Messrs. Tietz), but of more than ordinary interest, owing to the many exceptional technical devices used in that building.

In the two last-named cities, Frankfurt and Cologne, as also in Nuremberg, which was visited by the Commissioners, there were new theatres, which they went over most carefully. The one at Nuremberg was still in course of construction; the other two were completed. The Nuremberg one and that of Frankfurt were from the designs of Herr Seeling, the well-known German theatre architect; the one at Cologne is designed by Herr Carl Moritz, who is an adherent of the "Art Nouveau" School. All three theatres contained much that was instructive, though little that was essentially novel, i.e., novel as compared with what was to be seen some ten years ago when the evolution in theatre-building in Germany was taking place. All three were built by their respective municipalities; the Nuremberg one for both opera and drama, the other two for drama only. The municipalities who own them are to be congratulated on the very splendid buildings they have got, and, as far as we can judge, obtained at a very moderate expenditure, for the amount of work involved.

Speaking generally, throughout the journey the Commissioners were struck by the care taken in the construction of the buildings, notwithstanding the rapidity with which they were run up, and by the great interest shown by owners, whether business men or Corporations, that their buildings should be of architectural pretensions and be admired as works of architecture by their fellow citizens.

In conclusion, we should remark that the Commission had the benefit of having the whole of its programme most carefully mapped out in advance, with the aid of the British Consular Officers, and that the local authorities did their best to show the visitors what they wished to see. It is also needless to add that the Foreign Municipal Officials were most hospitable, as this is well known to all who have had occasion to visit the Continent.

Mr. Sachs acted as Chairman of the Commission. Mr. Ellis Marsland, of the Fire Prevention Committee, together with Mr. Horace Folker, of the National Fire Brigades' Union, acted as joint Hon. Secretaries. It is anticipated that a detailed illustrated report of the journey will be shortly issued by the British Fire Prevention Committee, and the publication will probably take the form of one of its usual red books.

OLD SCARBOROUGH.—A protest has been addressed to the *Times* against the proposal of the Corporation to remove the ancient market-cross from its present original site. As the writer further animadverts upon the alteration of the old names of some of the streets—for instance, "Merchants'-row" (the settlement of the Flemish traders) to "Eastborough"; "Blackfriarsgate" to "Queenstreet"; and "The Common" to "Victoria-road"—we may remind our readers that, on August 27, 1892, we published a historical article upon Old Scarborough, wherein mention is made of the places cited together with an account of the origin of the several "gates," the word "gate," for "street," being indicative of Danish occupation.

THE JUNIOR INSTITUTION OF ENGINEERS:

SUMMER MEETING IN GERMANY.

PERHAPS the decision that Germany should be the location of the present summer meeting of this society may have been regarded by some of its many friends as of too ambitious a character, but the great success of the gathering has justified in a most ample manner the Council's selection of the rendezvous. They had no doubt counted upon a warm welcome from the German engineers. It was unmistakably so, the members being received with the greatest kindness throughout the extensive tour, which included Dusseldorf, Oberhausen, Benrath, Elberfeld, Hanover, Berlin, Mariendorf, Charlottenburg, Leipsic, Frankfurt-on-Maine, Hanau, Homburg, and the Rhine.

The proceedings opened on August 13, when in the evening at the fine Municipal Concert Hall at Dusseldorf the civic authorities tendered greetings on the Institution's first entrance to the Fatherland. Associated in the ceremony as hosts were the Institution of German Iron Founders, the Lower Rhine District Association of German Engineers, and the Dusseldorf Institution of Architects and Engineers. Mr. Samuel Cutler, jun., the Junior Engineers' chairman, on this occasion and at other times gave fluent utterance in the Teutonic tongue to the Institution's acknowledgments, as did also Mr. F. R. Durham, of Frankfurt-on-Maine, the Hon. Secretary of the meeting.

The following day was spent in an inspection of the Dusseldorf Exhibition, under the guidance of Mr. Emile Hess, its engineering features, of course, receiving special attention. Next morning an early train was taken for Oberhausen, where are situated the great iron, steel, and engineering works of the Gutehoffnungshutte. Two divisions were formed for visiting them, one proceeding to the blast furnaces, steel works, rolling mills, etc., the other to the steel, iron, and metal foundries, engine and bridge works, etc. There appeared to be plenty of work under execution, and an extensive addition to the rolling mill was in course of building. After being entertained to luncheon in the Works Club House, the members went to the Benrath Crane Works, which is one of the largest of its kind in Europe and has attained such a well-merited reputation for the excellence of its products. Both steam and electricity are employed as motive power. The methods of testing the various parts, systems of erection, and other details were fully explained to the visitors.

On leaving Dusseldorf the party made for Elberfeld for the purpose of seeing the Langen Mono-Rail Suspended Electric Railway, which presents so many novel points of engineering interest. In this system the carriages are hung and travel from an overhead rail, which may be fixed at any level above ground or may be carried along the roof of a brick tunnel or iron tube. Another example occurs at Loschwitz, near Dresden. The Elberfeld line has a length of eight and a quarter miles and has been in operation since March, 1901. It now carries about 10,000,000 passengers per annum. Under the guidance of the engineers a complete inspection of the line was made, including car-sheds, power-house (current is supplied from the municipal works), stations, etc. In the afternoon the members arrived at Hanover, where on the next day the first visit was to Messrs. Korting Brothers' Works, erected in the year 1871, and now giving employment to 2,500 hands. The chief products are gas-engines, appliances for steam-users and manufacturers, pumps, boilers for steam and water heating, radiators, etc. Some special experiments with Korting injectors, steam-jet elevators, condensers, blowers, pulsators, etc., were carried out. The Korting ejector condenser is well known in England, over fifty electric-light and power stations being fitted with it. An interesting application of the spray nozzle was illustrated as it would be employed in cooling condenser water. It was also applicable to laying dust in colliery workings, purifying air of public buildings, damping tobacco, etc., cleaning blast and producer gases. Some powerful gas-engines were seen in the erecting shop, both of the Otto and the Clerk cycle. The former are built up to 200 h.-p. in one cylinder, and the latter single-acting up to 300 h.-p., or double-acting up to 1,500 h.-p. in one cylinder. The largest installation (40,000 h.-p.) of the Korting double-acting Clerk cycle engine is at the Laekawanna Steel Works. The importance of the heating engineering department of Messrs.

Korting may be gathered from the fact that annually 5,500 tons of castings, 1,500 tons wrought-iron tubes, and 33,000 valves are made use of. Hospitable entertainment followed the visit, and the Hanover Engine Works were then inspected.

They were founded in 1835 and have developed to such an extent that about 2,000 workmen are now employed. The manufacture of locomotives forms the principal work carried out, that department having been started in 1875. The total output to date has been close on 4,300, and forty engines can be fitted up simultaneously. The electric central station, with engines of 1,500 i.-h.-p., attracted special attention, and various processes with heat tools, etc., were arranged to be going on during the members' tour of the works. The toast of the "Hanoversche Maschinenbau" having been observed on leaving, the members then made their way to the Westinghouse Brake Company's Works, the construction and operation of the brake being fully explained, with the aid of an experimental apparatus such as installed at the London depot, King's Cross. The Hanover Gas Works were then entered, that the Pais electro-turbine gas recharging machine might be seen at work. The rapidity of its action was most striking, as the machine has only just been introduced. It is not possible to give definite results of working at Hanover for any length of time. In carriages which were kindly provided by Mr. L. Korting, the engineer of the Works, a who, by the way, is President of the German Association of Gas and Water Engineers this year, the members then had a most enjoyable drive to Herrenhausen; the fountain display a notable feature of the beautiful grounds was seen.

Mr. Korting also acted as cicerone to the members on the following morning, when the Zoological Gardens, provincial museum, and other places were visited. In the afternoon came the journey to Berlin, which was reached at about seven o'clock.

Friday morning was occupied by a most interesting visit to the Berlin Electric Overhead and Underground Railway and to the works of Messrs. Siemens and Halske. Assembling at the Potsdamer Platz station of the railway, the party were met by the engineer, and taken by train to the terminus of the Hirsch Warschauer Brücke. The car depot and workshops were shown, and after proceeding by rail from Schleischer Thor to Moecken Brücke the members walked over the bridge to the power station of the railway. The plant here consists of three Borsig engines of 1,200 h.p. maximum, and an engine of 1,800 h.-p. by the Gorlitzer Maschinenfabrik. The dynamos are directly coupled to the engines and are shaft generators for 800 kilowatts at 750 volts, constructed by Siemens and Halske. After going through the junction triangle the party took train again to the terminus of the line, and the Students' Union Club at Charlottenburg were entertained to luncheon by Messrs. Siemens and Halske, their works being visited in the afternoon.

In the large machine shop of the works the preparation and mounting of the various parts of dynamos, motors, etc., was seen. Other shops were occupied with resistances, starters and regulating resistances, apparatus for lifts and accessories for lifts and cranes, switchboards and switches, high-current apparatus, cut-outs, and line articles. The manufacture of arc lamps was also shown, and in the testing-room a highly interesting collection of different types of lamps were seen running. The Institution's summer dinner was successfully held in the evening at the Central Hotel, Berlin, the opportunity being taken of presenting to Mr. Durham a leather writing case suitably inscribed in expression of the members' appreciation of his valuable services as Hon. Secretary. On the following day the Mariendorf Gas Works of the Imperial Colonial Gas Association were visited in the morning, and the Royal Technical High School at Charlottenburg in the afternoon. The works are of the most modern description and afforded the members an excellent example of the latest practice in that class of work, having been completed as recently as the autumn of 1901. Special features consist of the coal handling plant, inclined retorts, coke conveying machinery, naphthalene washer, cyanogen washer, overhead loading station for the ammoniacal liquor, etc. A new holder was seen in course of erection by the Berlin haltische Co. The whole of the side sheets

be riveted by pneumatic riveters, air-compressing plant having been put down for the purpose. At the Charlottenburg School, where unfortunately there were no technical guides to the members round, perhaps the most striking feature was the large laboratory containing representative gas, oil, and steam engines of every type, aggregating over 800 h. p., with responding boiler power, by means of which students could test under actual working conditions every kind of motive power plant. A visit concluded the programme of the first week.

On Monday afternoon, August 22, the party left Berlin for Leipzig, remaining there Wednesday, when they went on to Frankon-Maine. On the invitation and under guidance of Mr. W. H. Lindley, an English engineer who has achieved great distinction on the Continent, the Water and Electricity works at Frankfort and the Sewage Works at Au, all of which were designed and carried out by him, were inspected. The arrangements made for these visits were most excellent and might well be followed in this country. It was pleasant to the members going over each work, Lindley, with the aid of diagrams and drawings, gave a general description in the form of a lecture. Members were thus in possession of the general characteristics of the undertaking in a much better position for seeking any special information having reference to their own branch of work. A fact which may not generally be known which was elicited in the course of the visit was that Mr. Lindley is largely due to the introduction into Germany of the steam turbine of large power.

On an excursion to Homburg took place on Friday afternoon, when the director of the visit conducted the members over the old and new buildings, where baths of every description were obtainable; the eight mineral springs and pumping plant for raising the water for use in the baths were also seen. On the historic Mans Terrace dinner was served in the evening, followed later by the fireworks of the annual Summer Festival. It was a delightful experience altogether. The next day the members travelled by train from Frankfort to reach to join the Rhine express steamer for trip to Bonn, and thence by train to Cologne, so as to be in time for the visit to Cologne. It should be mentioned that two extra visits occurred, at Berlin to Mr. W. Pittler's Experimental works, and the other to Messrs. Pittler's Lathes at Leipzig.

APPLICATIONS UNDER THE LONDON BUILDING ACT.

The Building Act Committee of the London City Council, at a meeting held on the 18th inst., dealt with the following applications for the London Building Act, 1894. The names of applicants are given in parentheses:—

Lines of Frontage and Projections.
Paneras.—Erection of a projecting clock over the Oxford Vaults, Kentish Town-road, Paneras, shown on the plans submitted Messrs. Murray and Co.).—Consent.
George, Hanover-square.—Erection of a window in front of No. 3, Deanery-street, Lane, St. George, Hanover-square Messrs. G. Trollope and Sons and Golls and Co. Ltd., for Mr. J. G. Joicey).—Consent.
Wandsworth.—Erection of buildings on the side of Streatham High-road, Streatham, the Streatham Lodge estate (Mr. P. C. G. G.).—Consent.
Bethnal Green, North-east.—Erection of buildings on the south side of Old Ford-road, Bethnal Green, between Nos. 12 and 30, with access to an advanced line of frontage Messrs. Davis and Emanuel for the East Dwellings Company).—Consent.
plam.—Retention of a wooden porch at 233, Queen's-road, Battersea (Messrs. Ilin Brothers).—Consent.
plam.—Retention of porches to eight sets of residential flats on the west side of Under-sweep, Battersea, between No. 1, Lavender-sweep and Limburg-road (Mr. I. L. George).—Consent.
ny.—Erection of projecting piers and cornice and an oriel window at Winchester-street, London-wall and Old Broad-street, (Mr. J. Belcher for the Trustees, Executants and Securities Insurance Corporation).—Consent.
Wolwich.—Erection of a porch at No. 1, Forest Hill-road, Lewisham (Mr. H. M. G. G.).—Consent.
enwick.—Erection of canopies to twenty-two houses on the east and west sides of Paddy-gardens, Old Charlton (Messrs. Wood and Rye).—Consent.

Lewisham.—Erection of an addition at the rear of No. 37, London-road, Forest Hill, to the line shown upon the plan submitted (Messrs. Dorrell Brothers for Mr. A. J. Dorrell).—Consent.
Marylebone, West.—Erection of an enclosed porch with steps and a wooden hood at No. 50, Maida-vale, St. Marylebone (Mr. T. F. Green for Mr. L. W. Green).—Consent.
Mid-land.—Erection of a wood and iron sign in front of the "Black Boy" inn, Mile-end-road (Mr. W. Husband for Mrs. E. A. Coake).—Consent.
Wandsworth.—Erection of porches to six semi-detached houses to be erected on the east side of Upper Parkfields, Putney (Mr. J. C. Radford).—Consent.
Wandsworth.—Retention of a projecting pent roof at No. 21, Lyford-street, Wandsworth-common (Messrs. J. A. J. Woodward and Sons for Mr. C. T. Coggin).—Consent.
Wandsworth.—Retention of a wooden porch and balcony and two bay windows to a building on the west side of Gwendolen-avenue, Putney (Mr. J. C. Radford for Mr. W. R. Williams).—Consent.
Woolwich.—Erection of porches in front of Nos. 59 and 60, Shrewsbury-lane, Plumstead (Messrs. J. H. and F. F. Hutchings).—Consent.
Woolwich.—Erection of a shop and studio on the north side of Eltham-road, Lee, at the corner of Meadowcourt-road (Mr. G. E. Clay for Mr. R. B. Daines).—Refused; undesirable to permit the existing frontage in Eltham-road to be disturbed.
Finchley, Central.—Erection of a proposed building on the site of Nos. 61 to 71 (odd numbers), inclusive, Collier-street, Pentonville (Mr. S. D. T. Pettit for Messrs. Everett and Co.).—Refused; for same reason as preceding.
Hackney, Central.—Erection of buildings on the south side of Darnley-road, westward of No. 1, to the line shown upon plan submitted (Mr. J. Hamilton for Mr. A. B. Salmen).—Refused; for same reason.
Hackney, North.—Erection of a one-story office building on the north side of Manor-road, Stoke Newington, eastward of No. 4, to the line shown upon plan submitted (Messrs. Turner and Holditch for Mr. H. M. Nurse).—Refused.
Islington, West.—Erection of a one-story shed at the rear of No. 21 and 23, Victoria-road, Holloway, to abut upon Chalfont-road, to line shown upon plan submitted (Mr. H. O. Ellis for Mr. G. R. Tiddall).—Refused.
Kensington, North.—Erection of a covered way at No. 24, Dawson-place, Kensington (Mr. J. W. Simpson for Mr. T. B. Wirgman).—Refused.
Kensington, South.—Erection of a one-story shop on the forecourt of No. 11, Beauchamp-place, Brompton-road, Kensington (Messrs. G. E. Hart and Co. for Mr. E. A. B. Wearing).—Refused.
Lewisham.—Erection of one-story shops in front of Nos. 86, 88, 90, and 92, Brownhill-road, Catford, to line shown upon plan submitted (Mr. T. A. Boughton for Mr. J. Allen).—Refused.
Westminster.—Erection of one-story shops in front of Nos. 79, 81, 83, and 85, Victoria-street, Westminster, to line shown upon plan submitted (Mr. B. Woodall for Mr. H. Webley).—Refused; it is considered undesirable to sanction the erection of the proposed shops on land at present in use by the public.
Width of Way.
Bethnal Green, South-west.—Erection of an addition to No. 453, Bethnal-green-road, Bethnal-green (Messrs. Harrington and Ley for Mr. J. Smith).—Consent.
City.—Retention of a one-story building on the western side of Swan-street, Aldgate, with the external walls at less than the prescribed distance from the centre of the street (Mr. A. Whitelaw for the London and North-Western Railway Company).—Consent.
Westminster.—Application of Mr. T. Kissack for an extension of the periods within which the re-erection of the rear portion of No. 6, Buckingham-gate, Westminster, at less than the prescribed distance from the centre of Stafford-place, was required to be commenced and completed.—Consent.
Woolwich.—Erection of houses with bay windows on the east and west sides of Back-lane, Artillery-place, Woolwich, and the widening of Back-lane as shown on plan submitted (Mr. H. O. Thomas).—Consent.
Deviations from Certified Plans.
Finchley, Central.—Certain deviations from the plan certified by the District Surveyor so far as relates to the proposed re-erection of No. 85, Goswell-road, St. Luke's (Mr. A. Young for the Improvements Committee of the Council).—Consent.
Holborn.—Deviations from the plans certified by the District Surveyor so far as relates to the proposed erection of a building on the site of Nos. 20 and 22, Neal-street, Holborn,

as shown upon plans submitted (Mr. M. T. Saunders for Messrs. Watney, Combe, Reid, and Co.).—Consent; but that the applicant be formed that the above consent must not be taken as in any way approving the water-closet shown on the ground plan, which is not in accordance with the Council's by-laws made under the Public Health (London) Act, 1891.
Strand.—Deviations from the plans certified by the District Surveyor so far as relates to the proposed re-erection of Nos. 48 and 49, Jermyn-street, St. James's, as shown upon plans submitted (Mr. W. Woodward for Mr. S. T. Miller).—Consent; but without approval of the pavement lights and vaults, which will require the sanction of the local authority.
Width of Way and Lines of Frontage.
St. George, Hanover-square.—Erection of a stone, iron, and glass porch at No. 73, South Audley-street, St. George, Hanover-square (Mr. P. Waterhouse).—Consent.
Strand.—Erection of a projecting clock and two oriel windows at Nos. 41 and 43, Wardour-street, Shaftesbury-avenue (Mr. H. M. Wakley for Mr. W. Clarkson).—Consent; but without approval of the pavement lights shown on the deposited plan.
Brecon.—Erection of two wooden oriel windows at No. 7, Crooms-hill, Greenwich, in the position and as shown upon plan submitted (Mr. H. Bugden for Mrs. E. C. Crook).—Consent.
St. George, Hanover-square.—Erection of a one-story shop at No. 2, Princes-row, Buckingham-palace-road (Mr. E. Stevens for Mr. H. G. Pett).—Refusal; within the prescribed distance from the centre of the roadways.
Brixton.—Erection of buildings on the site of Nos. 422 and 423, Coldharbour-lane, Brixton (Messrs. W. and J. Peacock for Mrs. Lockhart).—Refused; less than prescribed distance from centre of street.
St. Pancras, West.—Erection of a water-closet on the forecourt of Nos. 13 and 14, Miller-street, Camden-town (Mr. T. F. Strutt for Mr. H. Ward).—Refused.
Line of Frontage and Construction.
Deptford.—Erection of a building to be used as a greenhouse and cycle-shed in the garden at the side of No. 144, Breakspere-road, Brockley (Messrs. Jenkins and Sons for Mr. H. J. Morris).—Consent.
Width of Way and Temporary Building.
Rotherhithe.—Retention of a wood and iron coffee-house at the Rotherhithe-tunnel works on the north side of Rotherhithe-street, Bermondsey (Messrs. Price and Reeves).—Consent.
Working-class Dwellings.
Battersea.—Three intended dwelling-houses to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site at the rear of houses in Stamford-road, Battersea (Mr. E. Cannell).—Consent.
Width of Way, Space at Rear, and Projections.
City.—Deviations from the plans certified by the District Surveyor so far as relates to the proposed erection of a building on the site of Nos. 4 and 6, Cophthall-avenue, City (Messrs. E. Runtz and Ford for Messrs. J. Chessum and Sons).—Refused.
Line of Frontage and Space at Rear.
Wandsworth.—Erection of two buildings on the north-west side of High-street, Tooting, westward of Selkirk-road—extension of time (Messrs. D. Watney and Sons).—Consent; Messrs. Druces and Attles (similar application) to be informed of this decision.
Space at Rear, Means of Escape, and Projections.
Strand.—Deviations from the plans certified by the District Surveyor so far as relates to the proposed erection of a building on the site of Nos. 29 and 30, St. James-street, and Nos. 25, 26a, and 27, Bury-street, St. James's, with projecting balconies and porch next St. James-street (Mr. L. W. Green for Mr. J. Claxton).—Consent; but not approving the water-closets in the basement, which do not appear to comply with the Council's by-laws made under the Public Health (London) Act, 1891.
Means of escape in case of fire proposed to be provided in sixth story of same new building.—Consent.
Formation of Streets.
Wandsworth.—Formation of new streets for carriage traffic out of Tooting-bee-road and Upper Tooting-road, Upper Tooting, Wandsworth (Messrs. Lucas and Sons for Mr. F. W. Lucas, Mr. E. Lucas, and Mr. H. Erickson).—Consent.
Hackney, North.—Laying out of a new street for carriage traffic to lead from Amhurst-park-road to Stamford-hill, Hackney (Mr. C. Cheston for Mrs. E. M. Kelsey).—Consent.
Hammersmith.—Extension of the period within which a new street to lead from

Scrubs-lane to Hithel-road, Hammersmith, was required to be clearly defined and thrown open to the public (Mr. E. Collins).—Consent.

Haverstock.—Extension of period for the new street, to be named Howitt-street, to lead from Haverstock hill to Glenilla-street, Hampstead (Mr. C. T. Bentley).—Consent.

Battersea.—Variation from the plan sanctioned for the formation of two new streets at the rear of proposed buildings on the east side of St. John's-road, Battersea, between Battersea-rise and Beauchamp-road, so far as relates to a reduction in the number, and an alteration in the size, of the stables and stores in such new street.—Consent.

Greenwich.—Retention until August 23, 1905, of temporary gates at each end of the new street to lead from Kidbrook-grove to St. Germain's-place, Blackheath.—Consent; houses in the street not to be inhabited until all gates and barriers removed.

Clapham.—Laying out for carriage traffic of a street to lead from Kendon-road to High-street, Clapham (Mr. J. Donkin for the executors of the late T. G. Foster).—Refused; street not being of the full width of 40 ft. clear.

Wandsworth.—Laying out of new streets for carriage traffic on the Fisher-estate, between Leigham-court-road and Valley-road, Streatham (Mr. J. S. Gabriel).—Refused; no direct communication, and portions of the gradients steeper than 1 in 20.

Formation of Streets and Lines of Frontage.

Norwood.—Formation of six new streets for carriage traffic on the Sanders-estate on the west side of Denmark-hill and east side of Poplar-walk, Herne-hill (Messrs. R. Ellis and Son for Mr. R. A. Sanders).—Consent.

Erection of buildings on a piece of land on the east side of Poplar-walk and south side of Fernside-road, Herne-hill, to abut also on proposed new streets (Messrs. R. Ellis and Son for Mr. R. A. Sanders).—Consent.

Space at Rear.
Southwark, West.—Modification of the provisions of section 41 of the Act, so far as relates to the proposed erection of a cartshed, and three stories over, on the east side of Gravel-lane, Southwark, to extend over part of the open space at the rear of a stable building on the north side of Orange-street (Mr. E. Carritt for Mr. J. Sainsbury).—Consent.

Wandsworth.—Modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the south side of Vaux-road, Tooting, with an irregular open space at the rear (Mr. W. Bartholomew).—Consent.

Space at Rear and Means of Escape from the Top of High Buildings.

Newington, West.—Modification of the provisions with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the site of Nos. 17 and 19, Newington-causeway, Newington, at the corner of Union-road with an irregular space at the rear and to extend above the diagonal line (Mr. W. Gilbee Scott for Lord Redstock).—Consent; and also as to means of escape in case of fire.

Means of Escape from the Top of High Buildings.

City.—Means of escape in case of fire proposed to be provided on the fifth and sixth stories of a proposed addition to Winchester-house, Old Broad-street and London-wall (Mr. J. Belcher for Trustees, Executors, and Securities Insurance Corporation).—Consent.

City of London.—Means of escape in case of fire, proposed to be provided on the topmost story of Liverpool, London, and Globe Insurance Company's premises, at the corner of Lombard-street and Cornhill (Mr. J. Macvicar Anderson for the Company).—Consent.

St. George, Hanover-square.—Means of escape in case of fire, proposed to be provided on the fourth story of the Oriental Club, No. 13, Hanover-square (Mr. T. H. Watson for the Club).—Consent.

Buildings for the Supply of Electricity.
Bow and Bromley.—Plans for the construction of a pit or vault in front of the Glauco-street generating-station (Mr. H. Heckford for the Council of the Metropolitan Borough of Poplar).—Consent.

Woolwich.—Plans for the construction of an addition to the engine-room at the electric light station, Globe-lane, Woolwich (Mr. F. Sumner for the Council of the Metropolitan Borough of Woolwich).—Consent.

Marylebone, West.—Plans for the construction of two cooling towers at the generating-station, Richmond-street and Salisbury-street (Mr. A. Wright for the Council of the Metropolitan Borough of St. Marylebone).—Consent.

Cubical Extent.
Lewisham.—Erection at the Century Works, Conington-road, Lewisham, of a covered way

to unite the test-room block with the main shop, by which uniting the buildings will exceed 250,000 cubic ft. in extent (Messrs. Elliott Brothers).—Refused.

Dwelling-houses on Low-lying Land.

Camberwell, North.—Licence granted to the Metropolitan Borough Council of Camberwell for the erection of dwelling-houses on low-lying land situated in Beckett-street and Bailey-street, Camberwell, in accordance with plans submitted on their behalf by Mr. W. Oxtoby, Borough Engineer).—Consent.

Southwark, West.—Licence granted to the Housing Committee of the Council for the erection of a building on low-lying land in Webber-row site, Southwark, in accordance with the plan submitted on their behalf by Mr. W. E. Riley, Superintending Architect of the Council).—Consent.

COMPETITIONS.

BOYS' SCHOOL, DOUGLAS, ISLE OF MAN.—At a meeting of the Building Committee of the Douglas School Board, held recently, the Committee considered the report from Mr. E. R. Robson, of London, the architect appointed to advise the Board on the competitive designs sent in for the proposed new school in Demesne-road. Mr. Robson reported that in his opinion the designs submitted under the motto "Stabit" (the authors being Messrs. Bottomley, Son, and Wellbourn, of Middlesbrough) for a central hall school were the best sent in. The Committee recommend that the designs of Messrs. Bottomley, Son, and Wellbourn be accepted by the Board, subject to the conditions issued to architects in connexion with the competition.

BARNET ISOLATION HOSPITAL.—The committee have accepted the plans named "Economy," by Mr. J. Hugh Goodman (Reading); and have awarded the premium of 30 guineas to Messrs. Woodrow and Hilsdon (Chancery-lane, London), and the premium of 20 guineas to Messrs. Nicholls and Hollyday (Birmingham).

PUBLIC LIBRARY, WHITEHAVEN.—In the above competition the first premium has been awarded to Messrs. Greig, Fairbairn, and Macvicar, 31, York-place, Edinburgh; the second to Mr. W. A. Mellon, City-chambers, York; and the third to Mr. C. E. Hatchinson, 11, John-street, Bedford-row, London. The designs were to be on view at the Town Hall, Whitehaven, from Thursday to Saturday of the present week.

BOOKS RECEIVED.

REINFORCED CONCRETE. By Charles H. Mars, A.M.Inst.C.E., A.M.Inst.M.E. (Archibald Constable and Co. 3s. 6d.)

BY NILE AND EUPHRATES. By H. Valentine Geare. (Edinburgh: T. and T. Clark. 8s. 6d.)

THE SEVEN LAMPS OF ARCHITECTURE. By John Ruskin. Pocket Edition. (George Allen, 4s. 6d. and 2s. 6d.)

CARPENTRY WORKSHOP PRACTICE. By Charles F. Mitchell and George A. Mitchell. (Cassell and Co. 1s. 6d.)

BUILDING STONES. Edited by Paul N. Hasluck. (Cassell and Co. 6d.)

ROAD AND FOOTPATH CONSTRUCTION. Edited by Paul N. Hasluck. (Cassell and Co. 6d.)

QUARTERLY JOURNAL OF THE SANITARY INSTITUTE. (Edward Stanford. 2s. 6d.)

Correspondence.

"THE DRAINAGE OF A HOUSE."
SIR.—Will you kindly allow me briefly to reply to Mr. Samuel Smith's letter in your last issue (September 17) re above?

My article, criticising Mr. Smith's paper, was not written with the object of showing the width of my own knowledge or the narrowness of another's, but simply to foster a desire to elicit intelligent discussion on the best methods of sanitation as applied to house drainage.

It has brought forth a reply from Mr. Smith, which shows, at least, a want of courtesy in descending to personalities. His strictures, however, are wide of the mark, and as I do not consider any good purpose is achieved by recrimination, I must therefore decline to be drawn into any disputation with him.

In conclusion, I may add I do not resent the judicious criticism of anything I have written, and still less do I want to force my views on anyone who disagrees with them.

W. R. PURCHASE.

The Student's Column.

NOTES ON PORTLAND CEMENT.
CHAPTER IX.—THE USE OF:



REAT strides have been made in the last ten years in the manufacture of cement, and, although it is used for most purposes of building, etc.,

at one time lime was the cementing material employed, it cannot be said that a proportionate advancement has been made in its proper use and one often hears the expression that it is expensive, whereas, by judicious use, it may be employed cheaply and profitably.

The opinion so often expressed that a tenuous cement is bad is true only in instances, the cause of failure being generally attributable to improper handling.

Newberry says, "the first consideration in preparing cement concrete is to combine materials in such proportions as to produce the greatest possible density. This is accomplished by using just enough of the finer material to fill the voids in the coarse material. The percentage of voids in the latter should in all cases be carefully determined. This is most simply accomplished by the use of a metal box 1 cubic ft. capacity. This is filled with material to be tested, well shaken down, struck on one corner until it rises even with the surface and the weight again taken. The difference in the weight of water filling the voids of material. As 1 cubic ft. of water weighs 62.5 lb., from the weight of water found the percentage of voids can be calculated. In case of sand this method will not answer, as it is difficult to completely fill the voids of sand with adding water. The voids can, however, be readily calculated from the weight of a cubic foot of the material. The specific gravity of quartz sand is 2.65. A cubic foot free of voids would therefore weigh 2.65 x 62.5 = 165.6 lb. The weight of a cubic foot of well shaken down, is, however, found to be 112 lb., a difference of 53.4 lb. The proportion of voids is therefore $\frac{53.4 \times 100}{165.6}$ or 32.3 per cent.

"The calculations of the proportion in which the materials are to be mixed is as follows. Let us assume a sand with 32.3 per cent voids and gravel with 35.9 per cent. To fill the voids in the gravel with sand we shall require 35.9 volumes of sand to 100 volumes of gravel or 1 to 2.8. To fill the voids of the sand with cement we shall require 32.3 per cent. of cement to 100 parts by volume. The theoretical proportions will thus be cement, 11.6; sand, 35.9; gravel, 100; or, 1 to 3.1 to 8.6. It is a common practice to increase the proportion of sand more or less above that calculated to compensate for imperfect mixing, to obtain a concrete of greater strength. This, however, is an error. There is one proportion, and one only, which a given sand and stone can be mixed to give the minimum of voids. This is the proportion in which they should always be mixed, whether a rich or poor concrete is required. Cement 1, sand 3.1, gravel 8.6 may seem a poor concrete, but, in fact, is good, the secret of the quality being the correctness of the proportions.

"A small variation in the amount of sand gravel will convert it into an inferior concrete. To improve the strength, cement only should be increased, the increase of sand would weaken the concrete; properly proportioned concrete of 1 to 3 to 8½ is stronger than sand cement mixture of 3 and 1."

For concrete work the quality of the sand, gravel, or stone has much influence on the finished work. The sand should be clean, sharp, not too fine, and, if containing admixture of clay, it should be washed. If it is not generally recognised that a very small percentage of clay has great effect in making poor concrete. The gravel or stones should likewise be clean and hard. Soft material is unsuitable for good work. The material should be free from clay or mud. On one occasion the author had the investigation of a complaint that the cement supplied for a certain work would not set. On proceeding to the work it was easily seen where the fault lay. The cement was being used for fireproof floors, the aggregate supposed to be coke breeze. This, however, was not the case, but the aggregate contained nothing but cinders from a refuse destructor containing all kinds of rubbish, which formed a mud on the addition of water. When the cement was mixed with good, clean coke breeze it set quite satisfactorily.

one of the chief points to be observed in the preparation of cement mortar is that mortar which has commenced to set should not be mixed again by the addition of more water, or the engineering properties will be destroyed. On account of this, it is important for the consumer to know the setting time of the cement being used.

Unfortunately, it often occurs that the already set mortar is mixed with more water, which is unjustifiable complaints that the cement does not set well and that it will not harden. The consumer would do well to indicate to the manufacturer the time of setting of the cement required and the use to which he proposes to put the cement; in this way a great many complaints might be avoided.

A paper read before the Institution of Civil Engineers in 1887 on "Concrete Work under Water," the late Mr. W. R. Kinnipie advocated the use of what he termed "plastic concrete" for such work. This concrete was prepared and allowed to partially set before being deposited under water. Mr. Kinnipie claimed that by means of the cement lost but little of its strength, that where currents existed there was a chance of the cement being washed out of the aggregate, and the excessive proportion of cement otherwise required to allow for that being washed away was avoided. Mr. Kinnipie's experiments went to show that concrete of 1 to 1, after setting out of water for eighteen hours and then rammed into moulds, will form a monolithic mass when afterwards placed in water; but that the strength of this mass will vary much depend upon the time allowed for setting before deposition. If only eight hours were allowed between mixing and deposition, there is practically no reduction in strength, but with a longer interval the strength is gradually reduced, and at about eighteen hours it is little more than half.

This subject was investigated by Faija, who read a paper before the Society of Engineers in the Effect of "Sea-water on Portland Cement." He designated Mr. Kinnipie's concrete as "reset concrete," and stated that such concrete, to be of value, must be made with slow setting cement, and it must be broken up and pressed *in situ* at a particular period during its period of setting. His experience was that the breaking up of reset concrete and the re-gauging could be done at the moment when, by ramming, the original water of gauging can be brought to the surface. If that time was exceeded, and concrete, on being broken up and rammed, would be subject to the dissolving action of sea-water. Faija's experiments confirmed this view, and the noticeable point in them was that with quick-setting cement the reset concrete always showed a very considerable diminution in strength, whereas with slow setting the loss was not so great.

Working with concrete which has commenced setting is a very dangerous practice, no doubt accounts for some of the failures which the cement has been blamed.

Another point, in preparing concrete, which deserves attention is the addition of a proper amount of water. By the use of too much or a soft porous concrete is obtained, the cannot be properly finished off, and sealing takes place.

Too little water will give a weak concrete, the top will be rough and wear badly. As an indication of the wide variation in the use of water in mixing concrete, the replies to a thirty-five railroad companies to a circular inquiry from the Committee on Concrete of the American Association of Railway Superintendents of Bridges and Buildings, in evidence. These replies show that ten use a dry mixture, five a moderately dry mixture, sixteen a moderately wet mixture, and four a wet mixture. According to the report of the Committee, a dry mixture is one requiring repeated ramming to bring moisture to the surface, and a wet mixture one which sets when slightly rammed.

For the benefit of their own practice, the engineering and building department of the Chicago, Milwaukee, and St. Paul Railway conducted the experiments on this subject.

Two boxes, each a cubic yard in capacity, were carefully made and balanced on bridge girders, with a short piece of rail on the outer side of each stringer, and a third piece of rail placed across and under the other two at a central point between the two boxes. The boxes were then made to balance by hanging weights to the light end. In one box

was placed a very wet concrete, and in the other a dry mixture. The concrete was made of 1 part cement, 3-2 parts gravel, and 3-6 parts of crushed limestone. The gravel was composed of 51 per cent. of sand, which made the actual proportions about 1 part cement, 2 parts sand, and 5 parts stone. The water used for the wet mixture was 82 per cent. of the volume of cement used, and for the dry mixture 44 per cent. The latter mixture, by hard ramming, could be made to quake slightly, and moisture could be seen on the surface of each 6-in. layer. It took thirty-five minutes to fill the box with dry concrete, and twenty minutes to fill the other with the wet mixture. As soon as the boxes were filled, the central rail was shifted until the cubes balanced. It was found necessary to move the rail 0-3 ft. towards the wet cube, showing that the wet concrete weighed 9-7 per cent., or 340 lb. more than the dry mixture.

When the concrete had set and the frame was removed, the difference in the appearance was very apparent. The face of the cube of wet concrete was smooth and compact, while that of the dry cube was full of voids and very rough, notwithstanding more labour was expended in placing the dry mixture. The cubes were allowed to stand on the balance thirty days, and observations taken to see if the loss of excess water in the wet concrete would appreciably diminish its weight, but no such loss could be observed. The cubes were then broken by drilling 6-in. holes across the centre of the top and side surfaces, and bursting open with plugs. It was found that the wet concrete was much harder to break than the other; and the cube of dry concrete broke vertically down to the centre of the cube, and then the fracture followed the horizontal layer, which marked the top of the first batch of concrete deposited.

The interior of the wet cube was a solid, compact mass, with most of the pieces of stone broken across along the line of the fractured cube; while the interior of the dry cube was full of voids and a much larger percentage of the stones were pulled out instead of being broken, as they were in the wet mixture. The results of the tests show (1) that a moderate excess of water is not injurious; (2) more labour is necessary in mixing and placing a dry concrete than a wet one; (3) it is impossible to get a dense concrete without using what is, theoretically, an excess of water.

The idea that a dry concrete gives the best results no doubt comes from the fact that in laboratory tests the best results are obtained when a minimum of water is used, but the conditions prevailing in the testing-room are widely different from those which exist in practical working.

For instance, in the testing-room every precaution is taken that none of the water used for gauging is abstracted from the cement, while in actual work the concrete may have to be laid on porous soil, through which some of the water will soak away, or the aggregate may be of a porous nature and absorb some of the water intended for the cement.

OBITUARY.

MR. BATY.—The death, in London, is announced of Mr. Sebort Conrad Elton Baty, Director of Public Works in Mombasa, East Africa Protectorate, aged thirty-eight years. Mr. Baty was the second son of the late Rev. J. Baty, of Roehampton. Having graduated at Cambridge University, whither he proceeded from St. Paul's School, he was appointed land surveyor in the Mauritius, and after two years' service in that capacity was appointed, in 1892, Government Surveyor and Superintendent of Public Works in Seychelles.

MR. ENFIELD TAYLOR.—We have also to announce the death of Mr. H. Enfield Taylor, of Chester, who carried on an extensive practice as a civil engineer in Cheshire and North Wales. Mr. Taylor was engineer to the great Orme Tramway, Llandudno, and to the Hawarden Waterworks Company; he held the appointment of acting conservator on the Board of the river Dee Conservancy, and during a long period was managing director of the Chester Race Company.

SIR THOMAS BROWNE MEMORIAL.—Mr. Henry Pegram, A.R.A., is appointed sculptor of a statue to be erected in the Haymarket, Norwich, to the memory of the author of "Religio Medici," "Hydriothaphia," "Garden of Cyrus," and other works. Sir Thomas Browne, *obit* 1682, was buried in the church of St. Peter, Mancroft, in that city, but his remains have since been disturbed.

GENERAL BUILDING NEWS.

NEW PARISH CHURCH, SHERFIELD ENGLISH, HAMPSHIRE.—The new parish church at Sherfield English was recently consecrated. The design of the building is of late XVth century Gothic style, cruciform in plan, with chancel, choir, nave, north and south transepts, and north and south aisles, with a porch on the north side, and a heating chamber under the south transept. The church is planned to seat 180 worshippers, the nave, aisles, and choir only being utilised for seating, the north transept being at present used as an organ chamber, and the south transept as a vestry. The outside extreme length from east to west is 38 ft. 6 in., whilst the outside extreme width through transepts and choir is 51 ft. 6 in., and through nave and aisles 40 ft. 6 in. The height from ground-level to top of vane on spirelet is 37 ft. The church is built principally of red bricks, with dressings of Chilmark stone. The whole of the internal stonework is Bath stone. The tower has a square lower stage, rising into an octagon, with angle pinnacles with carved finials and flying buttresses, and two tiers of traceried openings filled in with slate louvres, the bells being placed in this part of the tower. All the windows have traceried heads. There is a peal of eight bells, made by Messrs. John Taylor and Co., of Loughborough. The floor has been laid with Cloisone ornaments by the Arrolithic Company. The artificial lighting is by oil lamps of forged iron and copper, the lamps being suspended by forged iron chains from the apex of the intrados of each arch. The greater part of the structural work of the church was carried out by Messrs. W. Roles and Sons, of Romsey, after which they transferred their contract to Messrs. Jenkins and Sons, Ltd., of Southampton and Bournemouth. The work has been carried out from the designs and under the personal superintendence of the architect, Mr. Fred Bath, Salisbury. Mr. W. Taylor, Salisbury, was the clerk of works.

NEW ROMAN CATHOLIC CHURCH, CATFORD.—The new Catholic Church of St. Cross, which, with a presbytery adjoining, has been erected in Sangley-road, Catford, was opened recently. The materials employed were brick and Portland stone, and the style of the building is Romanesque. Accommodation is provided for about 200 persons. The work has been carried out from plans provided by the late Mr. F. W. Tucker.

PRIMITIVE METHODIST CHAPEL, NEW SELSTON, YORKSHIRE.—On the 14th inst., the foundation-stones of a new Primitive Methodist chapel were laid at New Selston. The building is to cost 600l. The contractor is Mr. J. T. Brown, of Nottingham, the architect being Mr. J. Antcliffe, of Draycott.

NEW ROMAN CATHOLIC SCHOOL, COWDENBEATH, N.B.—A new school, which has been built in Stenhouse-street for the purpose of providing education for the Roman Catholic children in Cowdenbeath, was opened recently. The building was designed by Mr. W. Birrell, Kirkcaldy and Dunfermline, and provides accommodation for 400 pupils. Two doorways at either end—one for boys and the other for girls—open into a central corridor, off which there are eight classrooms. By means of Stone's patent sliding partitions the corridor and classrooms can be transformed into one hall, which outside of school hours it is intended to use for church purposes. The desks and other furnishings have been provided by James Bennet, Glasgow. To a height of several feet the walls are finished with varnished woodwork. Two cloak-rooms are provided besides private rooms for the principal teachers. Play-sheds have been erected in the playground. The cost of the work is 3,000l. The following are the principal contractors:—Builder, Andrew Wilson, Cowdenbeath; joiner, Wm. Simpson, Kirkcaldy; plasterer, John Paul and Sons, Cowdenbeath; painter, Andrew Allison, Cowdenbeath; plumber, Alex. Rolland and Co., Dunfermline; heating (by hot-water pipes and radiators), Dilworth and Carr, Preston.

NEW SCHOOLS, BURRADON, NORTHUMBERLAND.—On the 17th inst. new council schools were opened at Burradon Colliery. The building has been erected on the central hall principle, and provides accommodation for 750 boys and girls. Three classrooms are placed on the west side of the hall, while two long corridors run at right-angles to the hall, and from these are entered seven other classrooms, including cookery-rooms, teachers' room, cloakroom, and lavatories. The whole has been designed by Mr. W. Bedlington, architect, Newcastle, while the contract has been executed by Mr. Amos Gray. The cost of work has been 9,000l.

BUSINESS PREMISES, BRISTOL.—The reconstruction of the premises of Messrs. E. S. and A. Robinson, at the corner of Victoria-street and Redcliff-street, Bristol, has now been completed. The work has been carried out

by Messrs. Cowlin and Son, from plans prepared by Messrs. Oatley and Lawrence.

NEW WAREHOUSE, BRISTOL.—A new tea warehouse has been erected on Redcliff Hill, Bristol, for Mr. F. Budgett. The building has a frontage of about 60 ft., and is of Carr brook bricks. The electrical work has been carried out by Messrs. P. Jolin and Co., Bristol. Messrs. Wilkins and Sons were the general contractors, and the architect was Mr. H. C. H. Tarr, of Bristol.

NEW OFFICES, BIRMINGHAM.—The new offices of the Wesleyan and General Assurance Society in Steelhouse-lane, Birmingham, have been completed. The premises are of classic design, the principal elevations being constructed with Portland stone and grey granite, with red granite columns, the roofs being covered with green Westmorland slates. The structure covers an area of 12,500 sq. ft., having a frontage to Steelhouse-lane of 100 ft., and to Slaney-street, 120 ft., the total height from lowest floor to ridge being 120 ft. The sub-basement is used as a heating chamber and provisional space for future electric generating plant. The basement is arranged as a stationery store, etc. The ground floor office is approached from Steelhouse-lane by a portico entrance, the clerks' entrance being also from Steelhouse-lane. The entrance lobbies and principal doors, also counters, panelled dados, etc., are of polished teak, and the interior columns and pilasters are Scagliola marble. The board-room, manager's rooms, committee-room, and other private offices are upon the first floor, and approached by a flight of granolithic stone stairs, the entrance hall and corridor being paved with marble terrazzo, and dados lined with glazed tiling and oak. The remaining space upon first, second, and third floors are fitted up for a staff of clerks. A hydraulic passenger lift runs from the level of sub-basement to the highest floor, also three small hand lifts for the various departments. The caretaker's rooms occupy part of upper story. The building is lighted by electricity, the main switch-board being fixed in the basement with main switches to control lights upon each floor. The heating is by means of low-pressure hot water, about two miles of pipes, equal to 4 in. diameter, being used. The strong rooms have a superficial floor space of 3,252 sq. ft., and are fitted up with iron doors, racks, and shelves, which were supplied by Mr. John B. Field. The heating has been carried out by Messrs. G. N. Haden and Sons; the electric lighting by Mr. Walter S. Vaughton; the internal plumbing and sanitary work by Mr. Edward Hill; the external plumbing by Messrs. W. Woodfull and Son; the electric fittings by Messrs. S. Heath and Son, all of Birmingham. The hydraulic and other lifts were supplied by Messrs. Archibald Smith and Stevens, Battersea. The builders are Messrs. John Bowen and Sons, of Birmingham, and the architects Messrs. Ewen Harper and Brother, also of Birmingham.

FEVER HOSPITAL, LEEDS.—The new Leeds Fever Hospital is to be opened shortly. The hospital has been built on the one-storied pavilion principle, the various buildings being isolated from each other, the connexion being by covered ways, beneath which runs a continuous subway for carrying pipes and electric wires. The principal covered way is a quarter of a mile long. There are about twenty pavilions, each of which contains thirty beds, divided into wards of fourteen beds each, and two single-bed wards for private patients. A feature of the new pavilions is that they are raised on arches 5 ft. above the ground, and in the resulting open space beneath the floors run the water pipes and electric wires. Workmen will thus be able to make repairs and sweep the chimneys without entering the wards. Under normal conditions accommodation will be afforded for 240 scarlet fever patients, sixty diphtheria, 104 enteric, and forty-eight isolated cases—making a total of 452, whom it is possible to treat at the same time. Apart from the pavilions, there are administrative and residential blocks. The nurses' home contains accommodation for 100 nurses, and seventy female servants will be lodged in the servants' home. There will be in addition a male staff of over thirty, and sixteen cottages have been provided for married servants. The other buildings include waiting and discharge rooms, operating theatre, laboratory, mortuary, ambulance stables, laundry, and kitchens. There is a water and clock tower 110 ft. high. About 30,000 gallons of water are stored in the tower in case of a failure of the ordinary supply from the city mains. The buildings are of brick, with stone dressings, and electricity, generated on the spot, will be used throughout. Within a short distance of the fever hospital stands the smallpox hospital. This institution has been occupied for some months. There are here three main pavilions, affording accommodation for ninety smallpox

patients and fourteen isolation cases, in addition to nurses' and servants' homes and administrative buildings. There is no engine or boiler-house at this hospital, as it will be worked from the fever hospital. The contract for both hospitals was obtained for 200,000, by Messrs. H. Arnold and Sons, of Doncaster. The architect is Mr. Edwin T. Hall, of London, and Mr. A. Turner represents the Leeds Corporation as clerk of works.

WORKMEN'S CLUB, USHAW MOOR, DURHAM.—The new club premises for workmen which have been erected at Ushaw Moor were recently opened. The building occupies a site in Station-road, and has cost 7,000. There are a bar, sitting-rooms, and a hall capable of seating 700 people, also library, reading and billiard rooms, and other rooms for games. Mr. George Ord, of Durham, was the architect, and Messrs. Walton Brothers, of Crook, the builders of the new premises.

PUBLIC LIBRARY, MOTHERWELL, N.B.—The memorial-stone of the new Motherwell public library was laid a short time ago. The building is situated in Clyde-street, and will consist of a lending library of 50,000 volumes, reading-room for 100 readers, juvenile room, reference library, ladies' room, lecture-hall and museum, recreation-room, etc. The architects are Messrs. Greig, Fairbairn, and Macniven, Edinburgh.

YOUNG MEN'S CHRISTIAN ASSOCIATION PREMISES, BIRMINGHAM.—The new premises of this association, which are being erected at Dale-road, Birmingham, are now nearing completion. The building is designed in the Renaissance style, the principal features being the entrance arch and the oriel windows. The patent casements are filled with leaded glass of graceful pattern. The structure has a frontage of 93 ft., and is five stories high, with a double basement. There is an oak-tiled vestibule and a reception-hall, or "lounge," 53 ft. by 31 ft. Opposite the entrance is an arcade supported on scagliola pillars, and the centre will be occupied by an ottoman. There is a lecture-hall, which is 53 ft. by 35 ft. A larger hall is to be erected, when funds are available, on a piece of land reserved for it on the left of the existing hall. Opening out of the reception-hall is the assistant secretary's office, and a staircase leads down to the two dining-rooms and smoking-room, the walls of which are covered with cream and blue tiles. The main staircase, which is fireproof and provided with wrought-iron banisters, leads to the reading-room on the first floor, the walls of which are coloured a neutral grey, the floor being polished pitch-pine. The tables and reading-desks will be of fumed oak, and the seats will be upholstered in green pegamoid. On the same floor is the religious meetings-room, and there are also offices for the general secretary, accountant, and clerks. On the next story higher is the educational department. A separate staircase leads to the hostel, which comprises about forty bedrooms of various sizes, and a boarders' sitting-room. There are bath-rooms and lavatories on each floor. The rooms are all lighted by electricity, and there are electric bells in each of the bedrooms. A well has been prepared for a passenger lift, and service lifts are already provided. The furnishing contracts have been shared between Messrs. Chamberlain, King, and Jones, and Messrs. Holliday, Son, and Co. The gymnasium is situated at the back of the main building, and its floor space is 83 ft. by 55 ft. The gallery is designed to serve as a running track, about twenty laps to the mile. The accessories to the gymnasium include a plunge-bath, needle-baths, and spray baths. The work has been carried out by Mr. William Bishop, of King's Heath, from the plans of Messrs. Ewen and Alfred Harper, at a cost of over 30,000.

NEW WATERSIDE DEPOT, VICTORIA AND ALBERT DOCKS.—The Great Western Railway Company have opened a new waterside depot at the south side of the Victoria Dock, near the water channel leading to the Albert Dock. The following is a list of the contractors:—Steel work, Messrs. Cross and Cross, Walsall; electric cranes, etc., Messrs. Crompton; construction of wharf, The London and Tilbury Lighterage Constructing and Dredging Company. The plans were prepared in the Great Western Railway Company's engineer's office at Paddington.

NEW ALMSHOUSES, WOOD GREEN.—The new almshouses, which have been erected in Nightingale-road, Wood Green, were opened recently. The buildings have been erected by Mr. C. Gray Hill, from plans prepared by Mr. A. W. S. Cross, architect.

BANK PREMISES, BYKER.—The opening of a new branch of the savings bank at Byker took place a short time ago. The banking-room, with strong-room and lavatory, occupies the whole of the ground floor, with the main entrance in Shields-road and the exit in Heaton-road. The design is Renaissance in

treatment, and is faced with buff terra-cotta and brick on a polished granite base. The roof is covered with green slates, and floors are chiefly of wood on steel girders. The banking-room is warmed by hot-water radiators. The contract has been carried out by Mr. E. P. George, Newcastle. The contractors were: Messrs. Kirk and Dickson, slaters' work; Matthew Charley, plumbers' work; John Chapman, plaster work; James Small, painter and glazier's work. The granite, mosaic floor, hardware, structural door, and heating apparatus were supplied by Messrs. Emley and Sons. Mr. Richley acted as clerk of the works, and Stephen Piper, Newcastle, was the architect. The total cost of the building has been at 6,800. The electric lighting arrangements were entrusted to Messrs. Robson and Co., Newcastle.

STAINED GLASS AND DECORATION

BOLTON.—Under the instructions of Messrs. Pott, Son, and Hennings, of Bolton, stained-glass memorial windows have been erected in the Delph Hill Wesleyan Church. The artist was Mr. W. Camm, of Smethway. **WEST HARTLEPOOL.**—Two memorial windows have been erected in the Park-road Presbyterian Church, West Hartlepool, in memory of the late Sir William Gray and Alderman Lauder. The Gray window, which was designed by Lady Gray, the subject being "The Sower" and "St. Paul Preaching at Mars' Hill." The family arms are in tracery. The Lauder window, the gift of Colonel Lauder, J.P., and Mrs. Pymon, a latter of whom unveiled it, was similar character and treatment, having "The Christian Soldier" and "The Christian's Grin" as figure-subjects, with the family arms in the tracery above. The windows were from the studio of Mr. W. Camm, Smethway.

SANITARY AND ENGINEERING NEWS

SEWAGE AND DESTROYER WORKS, HYDE. At the meeting of the Manchester branch of the Association of Managers of Sewerage Disposal Works, held recently at Hyde, I. T. Horrocks read a paper describing sewage and destructor works now in operation at that town. In the course of remarks he said that the original works were designed and carried out by Mr. J. Mitchell, the Borough Surveyor, and were formally opened in August, 1895. They comprised a destructor building and sewage works buildings, with the necessary engines, pumps, and machinery. He then gave a detailed account of the treatment to which the sewage was subjected, and remarked that the treatment did not meet with the approval of the Joint Committee, who began to pressure upon the Corporation to improve their ways. Various new experiments were tried, and eventually it was decided to give the bacterial process a trial. Accordingly after conferring with Mr. C. Whittaker, Sewage Engineer of Accrington, it was resolved to construct a small experimental plant, and this was in operation upwards of two years, and uniform good results were obtained. In 1901 the Sewage Works Committee had under consideration the advisability of obtaining independent expert opinion as to the wisdom or otherwise of adopting this system of sewage treatment on a permanent basis. As a result of their deliberations Mr. Frank Scudder, F.I.C., F.C.S., of Manchester, was invited to test the Whittaker and Bryant filter under control, subject the same to such tests as he deemed, and report upon same when satisfied. Mr. Scudder, in his report, expressed the opinion that the Whittaker and Bryant filter was the one best adapted to the circumstances obtaining at Hyde Sewage Works, and upon this favourable report the Council felt justified in adopting the system on a permanent basis. In the meantime a scheme had been formulated for the conversion and extension of the existing works, at an estimated cost of over 22,000, and was presented to the Local Government Board, eventually obtaining the body's conditional consent. The new extensions were commenced in April, 1902, a few were now nearing completion. The whole of the new work had been carried out by Mr. Mitchell, he (Mr. Horrocks) acting as clerk of the works. Mr. Horrocks then gave a description of the present-day plant, and went on to state that, having regard to the fact that Hyde sewage is exceptionally bad, the development, or should he say development, of the scheme, would be watched with interest by many authorities and other persons interested with sewage disposal. The final effluent was excellent, and remarkable free from smell, and he believed, sufficient innocuous to pass into any river. The total area of the Borough of Hyde was 3,072 acres.

the population at the last census was 66,000,000, calculated upon an average flow of 1,000,000 gallons, was rather more than three gallons per inhabitant. There are also eighteen miles of main sewers and miles of private street sewers. **SEWERAGE SCHEME FOR LEEDS.**—It is stated Messrs. J. Mansorgh and Sons have made a report, at the invitation of the Corporation, upon a scheme for a new system of sewerage framed by the City Engineer in consultation with some leading specialists. Provision will be made to meet the requirements of an estimated population of some 300,000 persons, and it is recommended that extensive works for the treatment of sewage should be established at Gataforth; the estimated outlay upon the first portion of the project amounts to one million sterling.

MISCELLANEOUS.

CEMENT INDUSTRY IN AUSTRIA.—Mr. H. R. Archill, British Consul at Trieste, reports that the consumption of Portland cement during 1903 was somewhat greater than in 1902. A considerable quantity of cement is at present used for the construction of the new Tauri railway, and the manufacture of the Alpine regions of Austria will be for this reason sufficient work for several years. The prices of cement, compared with those of 1902, are not higher, and the trust Austrian Portland Cement Manufacturers do not, it is asserted, intend to increase prices. All the twenty manufacturing concerns are providing for the consumption of Austria belong to the trust; arrangements exist with fifteen manufacturing concerns of Austria within certain limits, standing in with the trust. The Austrian cement export to foreign countries was of small importance last year, only because many Austrian manufacturing concerns too far from the sea, but principally because there is an enormous over-production, many new manufacturing concerns have been set up in other countries. An establishment for the manufacture of Portland cement will be erected near Albora, in Istria, the proceeds of which is intended entirely for export. There are in the neighbourhood immense quantities of stone adapted for the manufacture of cement, and also a coal mine (Caro-Vines), all situated close to the port of Pula. A cement manufactory is also projected at Servola, near Trieste.

BIRMINGHAM MUNICIPAL SCHOOL OF ART.—An architectural class meets at the Central School throughout the session on Mondays, Wednesdays, Thursdays, and Fridays, from 7 p.m. to 9 p.m., and on Thursdays, also, from 5.45 p.m. to 7 p.m. The subjects taken are:—"Architecture (according to ornament syllabus)," by Mr. A. Freeman Smith; "Architectural Design," by Mr. F. Reynolds; "Architectural History," by Mr. W. H. Bidlake, M.A., I.R.A.; "Building Construction and Drawing (according to Government syllabus)," by Mr. Ralph Berrill, A.R.I.B.A.; and "Geometry—Practical Plane and Solid," by A. Freeman Smith. Mr. Alfred W. Smith, throughout the session, lecture "Taking Builders' Quantities," on Wednesday, from 5.30 p.m. to 6.55 p.m.

PICTURES IN POTTERY.—Messrs. Doulton and Co. send us a very artistically got-up small album on this subject, containing a number of illustrations on a small scale of tile-formed pictures which they have executed as mural decorations in hospitals and other buildings, decorated by a short account of various modes of faience and tile decoration, ancient and modern.

BOUND BOOKS IN LIBRARIES.—The cheapness of books has increased their vogue, but has lessened their interest. A book is not always the precious thing it once was. It was when a Bible cost 500 crowns, or a 2,000l. of our present money. No wonder it was chained in churches. The Black and Whites of Lincoln's Inn show that this practice has been abandoned there. There is an anecdote during the reign of King James I.:—at decent stools be provided, and that the desks be also made and chained for the books"; and a few years later the Inn books were valued at 20s. for twenty dozen of the same, and rings for the library, and there fresh order made that "all considerable books be chained." It appears that none of the existing books in the library retain chains or any part of them; but a considerable number—about forty—still have been added to the binding the ring or brass by which the chain was attached, and many more have the mark left by the ring now removed. "movable desk" and the "decent book" were essential appurtenances of a well-stocked library of any size. Even the zeal of medieval student was not equal to hold a chained folio. In the accounts of the

Middle Temple "chans for the books of the library" is a constantly recurring item; and a reader of Gray's Inn, in bequeathing his library, gives 40s. to the intent that he—the trustee—make by chains faster so many of them in the library at Gray's Inn as he shall think convenient." A chained library in all its quaint simplicity may still be seen at Winborne Minister, but the room is so small that the huge tomes can be deposited on a central table, to which the reader drags at each remove a lengthening chain.—*Law Journal.*

ASSOCIATED PORTLAND CEMENT MANUFACTURERS.—The fourth annual report of this Company states that, owing to the competition which the depression of trade has intensified, the selling price of cement has again fallen, while the higher price of coke has made fuel dearer for the year. The rotary kilns at Swanscombe and Arlesey have been working satisfactorily, and have produced an increased tonnage at a reduced cost. The largest of the Northfleet works has been equipped with a similar plant, and favourable results are anticipated for the current year from all these installations. The directors have appointed Mr. H. Osborne O'Hagan, who has rendered considerable and valued services to the Company during the last four years, to a seat on the Board, and to the offices of a Vice-Chairman of the Company, and a managing director. They will ask the shareholders to confirm their action.

THE WISHART PORT, DUNDEE.—We are glad to learn that the Town Council of Dundee have determined to preserve the old Wishart Port, the demolition of which was threatened. It is not a monument of architectural beauty, but it is a very interesting relic of the ancient history of the town; and there is such a disposition among municipal officials at present, under the idea of "improvement," to sweep away old buildings, that one is more pleased to find those of Dundee forming an exception.

PROPOSED MODEL LODGING-HOUSE, CONSETT, DURHAM.—On the 7th inst., at the monthly meeting of the Consett Urban District Council, the committee recommended the Council entering into a provisional agreement for the purchase of 1,115 sq. yds. of land in Steel-street, Consett, from the Consett Iron Company, for 227l. 8s., and that the Surveyor (Mr. W. S. Snell) be instructed to prepare plans and specifications of the probable cost of the building. It was suggested that the Surveyor first prepare the plans and specifications, and that the whole question, as well as the petition, be considered at the next meeting.

WAR MEMORIAL, SHEFFIELD.—A memorial is to be erected in the Sheffield Parish Churchyard to the officers and men of the York and Lancaster Regiment who fell in the Transvaal war. The monument will be 12 ft. from the ground, and will resemble a screen. The base will be of granite, and on each side will be an octagonal pillar, also in granite, about 9 ft. high and 14 in. in diameter. The space of 8 ft. between these pillars will be filled by bronze panels. The design is by Messrs. J. D. Webster and Son, architects, Sheffield, and the bronze work will be executed by Messrs. J. Starkie, Gardner, and Co., London. The cost will be about 450l.

CAPITAL AND LABOUR.

STATE OF TRADE IN SOUTHPORT.—The building trade in Southport is worse than it has been for the past thirty years, a large number of joiners being out of work. The depression is even more marked than it was last winter. Southport suffers more severely than other towns because the men have to depend on a residential population. There is already some distress evident. In the plumbing trade the outlook is very disappointing, and it is feared the winter will be a very severe one. The outlook is also extremely bad for the painters. There are 100 painters out of work in Southport at the present time, and as there are no large contracts to let things are assuming a serious aspect. One of the leading joinery firms is only working seven hours a day with half a dozen men, and this seems to be the rule adopted by others in the town.

BRICKLAYERS' DEBATE, TEES-SIDE.—A conference has taken place between the master builders of Tees-side and the Hartlepool and the operative bricklayers with regard to the dispute, and it was agreed that the wages should be 9d. per hour and the walking-time rule altered to one mile. The masters asked that there should be no limit with regard to apprentices, except legally binding, but the men asked that there should be specific terms with regard to apprenticeship, and that the number of apprentices should be governed by the number of bricklayers employed. The masters will meet to vote on this proposal.—*Yorkshire Herald.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

20,358 of 1903.—**THE WORMALD PATENT LOCKS COMPANY, LTD., and A. H. WORMALD:** *Locks and Keys for the same.*

A means for safeguarding locks, which consists in forming or providing the key way of the lock with a projection or projections, and the key with a corresponding slot or slots, or vice versa, so as to guard the key way and prevent the entrance therein of "unauthorised" keys.

21,657 of 1903.—**D. A. PRUST:** *An Attachment for Tables, Desks, Cabinets, and the like.*

This consists in the attachment of weights, by means of cords passing over pulley wheels, to the movable inner tray of the table, desk, or cabinet, in such a manner that the weights form a counter-balance to the tray and its fittings, and so assist the said inner tray to be raised and lowered automatically, by the opening and closing of the two hinged flaps, which form the cover or top of the table, desk, or cabinet.

22,657 of 1903.—**J. E. YORKE:** *A Fastening for Hinged or Pivoted Articles.*

This relates to a fastening for hinged or pivoted articles, consisting of a pin or its equivalent fixed to one part, and a sliding plate secured to the other part, said sliding plate being formed with one or a pair of inclined striking faces, and a slot or recess to engage said pin.

22,741 of 1903.—**F. W. ADAMS:** *Door Springs.* A door spring, consisting in the combination with the pivot pin on which the door is hung, of an arm connected by a flexible member, such as a chain, to the end of a lever, and of a coiled spring acting upon the said lever through the medium of a ratchet and pawl device.

23,411 of 1903.—**J. J. HEALY:** *Barge Courses and Angular Barge Tiles for Roofs, Rendering Barges Wind and Weatherproof.*

An angular barge tile, having one or more slotted screw holes in the vertical wing, to admit of the tile being secured, by means of one or more screws to the barge board, or to the gable rafter.

23,535 of 1903.—**J. THOMAS and J. FOSTER:** *An Automatic Lubricator for the Eccentric Shafts of Stone Breakers.*

Instead of oiling the eccentric shaft by means of an oil-box cast on or bolted to the top of the pitman as hitherto, the oil-box is cast on or bolted to the front of the pitman, from this oil-box two holes are drilled which go to an inner oil-well in which a revolving brush is inserted, or a felt roller mounted on two small springs, these springs keeping the brush or felt roller on the eccentric shaft, and by the eccentric shaft being turned the brush turns round also with it, and thus cleanses the eccentric shaft and lubricates it at the same time.

11,513 of 1904.—**C. LEHMANN:** *Presses for Moulding Bricks of Beton, and the like.*

An apparatus for the manufacture of bricks of beton, and the like material, comprising, in combination, a support, a plate fixed on the top of said support, provided with a suitable opening, a mould placed over said opening, a movable plate at bottom of said mould, a toothed gearing for lifting said bottom plate, and a hand lever for operating said toothed gearing, a removable cross-partition wall for the mould provided with vertical slots, removable longitudinal partition walls in the mould guided in suitable slots of the front wall of the mould, a bar connecting the front ends of the removable partition walls, and a guide fixed on the table for guiding said removable partition walls.

12,257 of 1904.—**E. G. GONZALEZ:** *Combination Furniture for Clinical and other purposes.*

This consists in the combination with a stand for clinical and other purposes of a commode arranged between the uprights thereof, and connected therewith by parallel joints or like connexions, which will permit it to be readily drawn out for use and restored to place.

12,793 of 1904.—**R. MERKEL:** *Chimney Cowl.*

A chimney cowl, in the lower part of which are outlets running upwards, the distinguishing feature being that the upper part of the cowl is shaped like a mansard roof, its primary form being that of a rhombus or rhomboid, and is provided inside with a partition and on two opposite sides with openings so that the smoke escapes without hindrance, irrespective of the side on which the wind strikes against the top of the cowl or the partition.

15,569 of 1904.—**J. NOLTE:** *Fireproof, Waterproof, and Weatherproof Structures.*

Fireproof ceilings and walls, constructed with sheet-iron framing, characterised by the fact

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

that the principal beams or girders are formed of sheet or plate iron which is stiffened by laterally riveted transverse joists, the extremities being placed upon plates or angle pieces, whilst the joists are provided at their lower part, with teeth or projections which secure the layer of concrete with which the panels of the ceiling are filled.

16,022 of 1904.—A. J. BOULT (J. Haslam); Construction of Skylights.

A sash bar, consisting of a bulbous head at the superior end of the web of the bar, a wide base to the sash bar, a cap adapted to fit over the contour of the superior part of the sash bar, and a closing plate at the end of the bar, the same being adapted to prevent the cap from slipping or sliding off the bar.

16,027 of 1904.—J. W. CRAVEN: Pug-mills. This consists, in the combination with pug-mills, a bearing surface, race, or receiver, on the upper end of the pug-mill shaft and an inverted bearing surface, race, or receiver, rigidly supported above the said pug-mill shaft and bolts or rollers, carried between the said bearing surfaces, races, or receivers.

20,609 of 1903.—T. C. FAWLEY: Construction of the Ceilings of Rooms or Buildings.

A construction of ceiling for the rooms of buildings, characterised by a shallow tank or series of tanks of metal, or any suitable fire-resisting material for water, said tanks being supported by any suitable means, and means for supplying water to such tank or tanks.

23,069 of 1903.—J. STOTT: A Construction of Apparatus for Filtering, Humidifying, Cooling, or Disinfecting Air to be Supplied to Buildings.

An apparatus for filtering, humidifying, cooling, or disinfecting air to be supplied to buildings, and consisting in constructing a revolving drum with two or more concentric-arranged layers of filtering material with a space between each layer, so that all the air drawn or forced through the drum must pass through each layer of filtering material.

23,615 of 1903.—THE FIREPROOF PLATE WALL COMPANY, LTD., and C. H. SIDEBOTHAM: Construction of Ceilings, and other Structures.

A building plate or slab constructed with longitudinal flanges a short distance from either end to project between the joists, strengthened by webs running across between the flanges, and adapted to be held in position by nails, screws, or pegs driven through the flanges into the sides of the joists, and nails, screws, or pegs driven through the edges of the plate into the face of the joists and grouted solidly to the joists.

24,361 of 1903.—F. E. COOPER: A Paving Block.

A wood-paving block, consisting of a plurality of wood slabs, of the width and depth of the block, having a deep, narrow groove along each side, and a dog of tin, flat metal, with spikes or spike portions, the body of the dog lying within said grooves, and the spikes or spike portions being driven into the slabs.

6,919 of 1904.—C. E. TWYNHAM and H. DANIEL: Apparatus for Collecting and Removing Refuse from Wood Paving, and other Road Surfaces.

An apparatus for collecting and removing refuse from road surfaces, consisting in the combination of a sludge-removing implement or sucker, a tank or receptacle in connexion with said implement, and arranged upon a vehicle, said tank being arranged to have a vacuum created and maintained therein, a suction pump connected to said tank, and a rotary brush arranged to sweep the mud into the path of the said implement.

7,756 of 1904.—R. BAILEY: Hods.

This invention has reference to, and comprising improvements in and relating to hods such as are used by bricklayers, and has for its object to render them stronger and more durable. In carrying into practice the improvements of this invention the ordinary wooden brackets securing the sides of the box to the pole are dispensed with, and steel or iron brackets are used instead. These improved brackets are stamped or embossed out of sheet metal, preferably of mild steel. They are bent to the desired angle to fit the angle of the bod-box and pole, and are formed throughout their length of U or gutter shape, having a flange all round the edge. They are preferably secured to the bod-box and pole by screw nails passing through holes in the flange.

14,222 of 1904.—J. HARRIS: Method of Directing Daylight into Buildings, and the like.

For directing daylight by reflection with or without refraction, consisting in the employment of glass prisms or rows of prisms set in planes above, or successively above, the plane of prisms in closely adjacent rows.

MEETINGS.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—District Meeting at Withington, near Manchester.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.—Quarterly meeting of the Directors. 8 p.m.

ARCHITECTURAL ASSOCIATION.—Annual General Meeting: President's Address and Distribution of Prizes. 7.30 p.m.

INCORPORATED BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Monthly Meeting at Carpenter's Hall 6 p.m.

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"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 12s. per annum (52 numbers), cash in advance.

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SOME RECENT SALES OF PROPERTY.

Table with columns for location, description, and price. Includes entries like 'Haddenham, Cambs.—Hill Row, a copyhold close, 5 a. 0 r. 0 p.', 'Stamford Hill, 72, Cranwick-rd., ut. 79 yrs.', 'Stoke Newington—35, Queen Elizabeth's-wk., ut. 71 yrs.', 'Anerley, 21, Selby-rd., ut. 61 1/2 yrs.', 'Gillingham, Kent—'Mulberry Tree Farm', '4, Kingswood-rd., E. 1/2, ut. 42 yrs.', 'Stood, Kent.—2 to 10 (even), Brompton-la., l. w.r. 67 1/2 yrs.', 'Oystermouth, Glamorgan.—West 0/2, Ivy Cottage and 'Ivy Dene', ut. 39 yrs.', 'West Cross, 'Ty Glyn', c. yr. 60l.', 'Clyne Common, c.g. rents 9l. 10s. reversion in 65 and 72 yrs.', 'Gower's Cross Farm, 24 a. 1 p. c.', 'Empshott, Hants.—'Brunstable Farm', 34 a. 2 r. 24 p. c., yr. 30l.', 'Newton Valance, Hants.—'Lower Noar Hill Farm', 48 a. 1 r. 21 p. c.', 'West Ham.—27 to 53 (odd), Kent-st., ut. 76 yrs.', 'Norwood.—34, Palacesq., ut. 79 yrs.', 'Greenford, Middlesex.—'Kingsley Cottages' (two) and 0 a. 3 r. 5 p. l., yr. 50l.', 'Croydon.—34 and 35, Windsor-rd. (s.), ut. 63 1/2 yrs.', 'Chichester, Sussex.—'Portfield Windmill' with house and shop, l. p. c.', 'Stamford Hill.—10, Eastbourne-rd., ut. 65 1/2 yrs.', 'Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.l. for unexpired term; p.a. for per annum; y.s. for years; l.a. for lane; s.t. for street; w.r. for road; sq. for square; p. for place; ter. for terrace; cres. for crescent; av. for avenue; g.d.s. for gardens; y.d. for yard; gr. for grove; h.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

PRICES CURRENT OF MATERIAL

. Our aim in this list is to give, as far as possible, average prices of materials, not necessarily the lowest quality and quantity obviously affect prices—a which should be remembered by those who make up this information.

Table listing prices for various materials. Columns include material name, price per unit, and additional notes. Includes sections for BRICKS, GLAZED BRICKS, BATH STONE, PORTLAND CEMENT, and YORK STONE.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered.
*External Treatment of Building for Tropical Climate	Sandars & Harding	50l.	Dec. 1

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered.
Gen. Repairs, Painting, etc., of Tara Hall, Co. Meath	Warrington Electricity Committee	J. F. McGahan, Architect, 3, Earl-street, Dundalk	Sept. 1
Renovation, Repairs, etc., of Outbuildings, Co. Meath	Warrington Electricity Committee	do.	do.
Wood Palling and Shed with Corrugated Iron Roof	Headrowen Building Club	F. V. L. Mathias, Engineer, Electricity Works, Howley	do.
Erection of Cloakroom at Booth Town Council School	Manchester Corporation	Borough Engineer, Town Hall, Halifax	do.
Limestone Tar-paving	Morley Highways Committee	Town Surveyor, Broadstairs	do.
Reconstruction of Bridge, Christchurch	Southampton County Council	County Surveyor, The Castle, Winchester	do.
Extension and Addition of Swimming Bath to Baths	Altrincham U.D.C.	Council Offices, Town Hall, Altrincham	do.
Steam Rolling and Repairing Main Road	Abbeyleix R.D.C.	Clerk's Office, Workhouse, Abbeyleix	do.
Portland Cement	Yowes U.D.C.	Council's Engineer, Cowes, Isle of Wight	do.
Making-up Roads	Ilford U.D.C.	H. Shaw, Engineer, Town Hall, Ilford	do.
Steel-rolled Jolt Gearing	River Ware Commissioners	R. H. Wake, Engineer, Commissioners' Quay, Sunderland	do.
Sewering, Road-making, and Paving Works	Manchester Corporation	Paving, etc., Department, Town Hall, Manchester	do.
Leveling, Paving, Flagging, etc., of Streets	Penre Brewery Co., Ltd.	A. G. Evans, Architect, Pontypridd	do.
Rebuilding "Boot Inn," Dinas	Halifax Corporation	Borough Engineer, Town Hall, Halifax	Sept. 2
Erection of Verandah in the Market Hall	Leeds Waterworks Committee	City Engineer, Leeds	do.
Transporting Bricks	Edmonton U.D.C.	Council's Engineer, Town Hall, Lower Edmonton	do.
Wood Paving Works	Bedford Borough Council	Borough Engineer Town Hall, Bedford	do.
Corrugated Iron Building at Waterworks Reservoir	Barnes U.D.C.	Council Offices, High-street, Mortlake, S.W.	do.
Wiring for Electric Lighting	Gillingham (Kent) Corporation	Clerk, Corporation Offices, Gillingham, Kent	do.
Supply of Seta	The Trustees	The Management Committee	do.
Rails & Fishplates, Spikes (Dog), Elec. & h.p. Cranes	Secretary of State for India	Director-General of Stores, India Office, Whitehall, S.W.	do.
Materials for Steel Foundry, and Tools and Stores	Bombay, Baroda, etc., Railway Co.	Company's Offices, Gloucester House, Bishopsgate Without, E.C.	do.
Shops and Hoses, Henoced	Sunnybank Cottage Co., Ltd.	G. A. Trehearne, Architect, 18, Canon-street, Aberdare	do.
Erection of Co-operative Stores, Binegwynn	Tottenham T.D.C.	D. Evans, Architect, 49, Villers-road, Tottenham	do.
Supply of Stores for Gas Department	Glasgow Corporation	W. Wilson, Engineer, 65, John-street, Glasgow	do.
Team Labour	Sowerby Bridge U.D.C.	Surveyor, Council Offices, Sowerby Bridge	Sept. 2
Fixing Ventilators, Alters, to Offices, etc., at Schools	Middleton Cheney Schools	W. J. Treadwell, Surveyor, Middleton Cheney	do.
55 Houses and Road Formation, Rhonda Valley	Headrowen Building Club	W. D. Morgan, Architect, Penre, Glam.	do.
Municipal Buildings	Leigh (Lancs.) Corporation	S. C. Freshwick, Architect, Leigh	do.
Public Baths	Moss Side U.D.C.	Council's Engineer, Moss Side	do.
Granite Spalls	West Ham Union	Clerk, Union Workhouse, Leytonstone, N.E.	do.
Making-up Mews	Wood Green U.D.C.	Council's Surveyor, Town Hall, Wood Green	do.
Supply of Goods and Materials	Abertou U.D.C.	Council's Surveyor, Town Hall, Abertou	do.
Sewage Disposal Works	Wincanton R.D.C.	Council's Engineer, 28, Baldwin-street, Bristol	do.
Gasholder Tank and Buildings for a Gasworks, Herts.	First Garden City, Ltd.	C. Hunt, Engineer, 15, Victoria-street, S.W.	Sept. 21
Area for Boiler Clinker Storage at Infirmary	Southwark Guardians	G. D. Stevenson, Architect, 13 and 14, King-street, E.C.	do.
Branch Drainage, San. Work, & Bitings, Infirmary	F. J. Mitchell, Esq., J.P.	W. H. D. Caple, Architect, Church-street-chambers, Cardiff	do.
Alterations to Park Cottage, Lanfrefha, nr. Caerleon	Antrim R.D.C.	do.	do.
Alterations to Lanfrefha National School, Mon.	Brighton Borough Council	J. Clark, Union Office, Antrim	Sept. 30
Erection of Labourers' Cottages	Southwam U.D.C.	Borough Engineer, Town Hall, Brighton	do.
Conver. of Four Houses into Shop & House, Halifax	Admiralty	R. W. Evans, Commercial Bank-chambers, Halifax	do.
Painting Public Works	New Classroom and Alters, to Schools, Byfleet, Surrey	Superintendent Civil Engineer, H.M. Dockyard, Devonport	do.
Supply of Granite and Dross	Broken Granite and Chippings	Borough Surveyor, Lynton, Surrey	Oct.
*New Coastguard Buildings at Polman, near Fowey	Turntable at Car Works	Manchester Corporation Tramways	do.
Reeroading Machine House, Cardiff	Reeroading Machine House, Cardiff	T. Owen and Co., Ltd.	do.
Erection of School Buildings	Erection of School Buildings	Edinburgh U.D.C.	do.
Steam Road Roller and Scarifier	Steam Road Roller and Scarifier	Paddington Borough Council	do.
Erection of Car Sheds, Workshops, and Offices	Erection of Car Sheds, Workshops, and Offices	Erith U.D.C.	do.
Broken Granite	Broken Granite	Guildford Town Council	do.
Twelve Cottages, Napsbury Asylum	Twelve Cottages, Napsbury Asylum	Middlesex County Council	do.
5,000 Tons of Earth or Rocking to Beach	5,000 Tons of Earth or Rocking to Beach	Felixstowe and Walton U.D.C.	do.
Houses at Drogheda, Fockeery, Portadown, etc.	Houses at Drogheda, Fockeery, Portadown, etc.	G.N. Railway Co. (Ireland)	do.
Road-making and Paving Works	Road-making and Paving Works	Lewisham Borough Council	do.
Cast Iron Pipes	Cast Iron Pipes	Slipton U.D.C.	do.
Supply of Stores	Supply of Stores	Lanashire and Yorkshire Railway	do.
*Completion of Six Villas, Westbury-avenue, N.	*Completion of Six Villas, Westbury-avenue, N.	Friern Barnet U.D.C.	do.
Erection of Public Offices	Erection of Public Offices	G.W. Railway Co.	do.
Erection of Six Cottages, Perranporth, etc., Cornwall	Erection of Six Cottages, Perranporth, etc., Cornwall	Sheffield Watch Committee	do.
Supply of Timber	Supply of Timber	Bolton-on-Deane U.D.C.	do.
Police Station and Residence, Wincobank, Sheffield	Police Station and Residence, Wincobank, Sheffield	do.	do.
Private Street Works, Kathleen-street, Goldthorpe	Private Street Works, Kathleen-street, Goldthorpe	Brentford U.D.C.	do.
Private Street Works, Nora-street, Goldthorpe	Private Street Works, Nora-street, Goldthorpe	Barking Town U.D.C.	do.
Council's Offices and Library	Council's Offices and Library	Popham Borough Council	do.
*Forming Roadway and Retaining Wall, Kew Bridge	*Forming Roadway and Retaining Wall, Kew Bridge	Richmond Main Sewerage Board	do.
Erection of Workmen's Dwellings	Erection of Workmen's Dwellings	St. Leonard, Shoreditch, Guardians	do.
Public Library Buildings	Public Library Buildings	Trustees of the Coelsteson Bldg. Club	do.
Alterations, etc., St. James's School	Alterations, etc., St. James's School	Croydon R.D.C.	do.
Pumping Machinery and Electric Motors	Pumping Machinery and Electric Motors	Wandsworth Borough Council	do.
New Road and Drains, Pontilottyn, Glam.	New Road and Drains, Pontilottyn, Glam.	Hull Corporation	do.
*Painting, etc., Workhouse Infirmary	*Painting, etc., Workhouse Infirmary	Brighton Borough Council	do.
Twenty Semi-detached Villas	Twenty Semi-detached Villas	Borough of Southwold	do.
Sewering, Road-making, etc.	Sewering, Road-making, etc.	Exeter Corporation	do.
Disinfecting Station, etc., Tooting	Disinfecting Station, etc., Tooting	Retnrew and Clydebank Jt. Hos. Bd.	do.
Cast-iron Flange Pipes and Special Castings	Cast-iron Flange Pipes and Special Castings	Metropolitan Railway Co.	do.
Granite Kerb, Channel and Granite Spalls	Granite Kerb, Channel and Granite Spalls	Edinburgh Corporation	do.
Erection of Sixteen Workmen's Dwellings	Erection of Sixteen Workmen's Dwellings	Pontypridd U.D.C.	do.
Car Shed for Electric Tramways	Car Shed for Electric Tramways	Ludlow Town Council	do.
Extension of Blawarthill Hospital	Extension of Blawarthill Hospital	do.	do.
Supply of General Stores	Supply of General Stores	Inswich Corporation	do.
Sewage Disposal Works	Sewage Disposal Works	Malvern U.D.C.	do.
Retain. & Fence Walls, & Widening Carriageways, etc.	Retain. & Fence Walls, & Widening Carriageways, etc.	Hanwell U.D.C.	do.
Steam Motor Waggon and Special Equipment	Steam Motor Waggon and Special Equipment	Church Stretton U.D.C.	do.
Sewage Disposal Works	Sewage Disposal Works	Oakenages U.D.C.	do.
Construction of Railway	Construction of Railway	do.	do.
Dry-Back Marine Type Boiler	Dry-Back Marine Type Boiler	do.	do.
*Public Library	*Public Library	do.	do.
Sewering and Road-making	Sewering and Road-making	do.	do.
Sewers and Disposal Works	Sewers and Disposal Works	do.	do.
Drainage Work at Sewage Farm	Drainage Work at Sewage Farm	do.	do.

ILFORD.—For the erection at the electricity works, Ley-street, of steel coal bunkers, for the Urban District Council. Mr. A. Shaw, M.Inst.C.E., Electricity Works:—
Jukes, Coulson, Stokes, & Co., Bromley.
by-Bow..... £123

KING'S LYNN.—For making-up new streets on the Spread Eagle Estate, for the Corporation. Mr. H. J. Weaver, Borough Surveyor, King's Lynn.
Renant Bros..... £298 | J. Medwell, Railway-
J. J. Bone..... 259 | road, King's Lynn* £195

LEWISHAM.—For the kerbing, paving, &c., of the following, for the Lewisham Borough Council:—

Sandrock-road (part of).
Harvey Bros. £549 | H. Woodham & Sons £375
B. Martin 395 | Fry Bros.* 314
J. Mowlem & Co., Ltd. 385 |

Radford-road (part of).
Harvey Bros. £935 0 0 | H. Woodham &
J. Mowlem & Co. 608 0 0 | Sons £569 0 0
B. Martin 602 11 5 | Fry Bros.* 550 0 0
W. Pearce 582 0 0 |

Madlin-road (part of).
Harvey Bros. £349 0 0 | Fry Bros. £264 0 0
J. Mowlem & Co. 299 0 0 | B. Martin 260 0 0
H. Woodham & Sons 265 0 0 | W. Pearce* 245 0 0

Garthorne-road.
Harvey Bros. £1,943 0 0 | Fry Bros. £1,518 0 0
J. Mowlem & Co., Ltd. 1,593 0 0 | H. Woodham & Sons* 1,452 0 0
B. Martin 1,573 17 7 |

Stondon Park.
Harvey Bros. £3,376 0 0 | H. Woodham & Sons £2,117 0 0
J. Mowlem & Co., Ltd. 2,299 0 0 | B. Martin 2,096 1 9
W. Pearce 2,124 0 0 | Fry Bros.* 1,981 0 0

Oversleigh-road (part of).
Harvey Bros. £1,240 4 8 | H. Woodham & Sons £861 0 0
B. Martin 695 10 0 | Fry Bros.* 639 0 0
J. Mowlem & Co., Ltd. 680 0 0 |

Stondon Park.
J. Mowlem & Co., Ltd. £729 0 0 | Patent Victoria Stone Co., Ltd. £504 16 6
B. Martin 715 19 0 | J. Ellis & Sons, Ltd. 583 8 9
Adamant Stone & Paving Co., Ltd. 713 0 0 | Preston Granite Concrete Co., Ltd. 585 0 0
Fry Bros. 687 0 0 | Empire Stone Co.* 577 0 0
Harvey Bros. 663 15 3 | H. Woodham & Sons 605 10 0
W. Pearce 596 0 0 |

Oversleigh-road (part of).
J. Mowlem & Co., Ltd. £290 0 0 | J. Ellis & Sons, Ltd. £233 3 0
Adamant Stone & Paving Co., Ltd. 271 10 0 | Empire Stone Co. 232 10 0
Ltd. 288 0 0 | Preston Granite Concrete Co., Ltd. 230 0 0
B. Martin 270 0 0 | Ltd. Patent Victoria Stone Co., Ltd.* 209 15 0
Fry Bros. 243 0 0 | Harvey Bros. 241 1 9

PLYMOUTH.—For the erection of Sherwell Mission Hall, Clare-place, Plymouth, for the Sherwell Congregational Church, Plymouth. Mr. J. Harvey, architect and surveyor, 5, Courtenay-street, Plymouth.
Quantities by the architect:—
T. May £1,025 | Pearce Bros. £857
W. Park & Son 908 | J. H. Palmer 847
J. Partridge, jun. 985 | J. Griffin 815
W. T. Stevenson 915 | A. Andrews, Plymouth* 783
G. B. Turpin 878

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ST. ALBANS.—For the erection of a pair of semi-detached houses, at Bedford Park-road, St. Albans. Mr. Harold Goslett, A.R.I.B.A., architect, 28, Theobalds-road, W.C.:—
Gough & Co. £1,949 | Vail & Williamson, C. Miskin & Sons. 1,650 | St. Alban* £1,353

SANDAL MAGNA (Wakefield).—For erecting stables and other buildings, for the Urban District Council. Mr. F. Massie, F.S.I., Tetley House, Wakefield. Quantities by the architect:—

Builder: T. Lee, Howard-street, Wakefield* £379 13 6
Joiner: Appleyard & Dickinson, Lofthouse, near Wakefield 96 0 0
Plumber: H. Gillott, Cheap-side, Wakefield* 15 9 6
Painter: H. Sanderson, Wesley-street, Osselt 7 0 0
Painter: Broadbent & Son, Kirkgate, Wakefield* 5 7 6
Slater: Pickles Bros., 66, Park-lane, Leeds* 56 0 0

WALSALL.—For additional buildings for boys and girls, Highfield-street, for the Governors of Queen Mary's School, Messrs. Bailey & McConnell, architects, Bridge-street, Walsall:—

W. Sapcote & Sons £5,874 | M. A. Lynex £5,275
E. Hadley & Sons 5,063 | W. Kindrick & Sons 5,269
S. Warburton 5,663 | E. Giles & Son 5,178
J. T. Beech 5,491 | J. Herbert 5,156
W. & J. Webb 5,484 | E. L. Jones 5,100
T. J. Mason 5,475 | T. Hardy 5,078
H. Wilcock & Co. 5,419 | W. Westacott 5,075
H. J. Petts 5,390 | H. W. Gibbs 5,070
J. Dallow & Sons 5,399 | G. Goodwin 5,028
J. G. Foster, jun. 5,350 | Gowing & Ingram 5,027
Brookhurst & Wood 5,350 | G. H. Marshall 4,999
E. Clatwin 5,315 | S. Wootton, Ebbw Harley & Son 5,313
T. Mason 5,305 | wick* 4,998

WHITCHURCH (Wales).—For 430 yds. of earthenware pipe sewer, Velindre and Tynypwll roads, for Llandaf and Dinas Powis Rural District Council. Mr. J. Holden, Engineer, Council Offices, Llandaf-chambers, 35, St. Mary-street, Cardiff:—

Public Works A. G. Collins £203 18 9
Co. £227 8 5 | E. Osmond & Sons, Ebbw Vale 177 8 9
E. Williams 216 1 8 | F. Ashley 208 11 2 | Glam.*

YNYSBETH (Wales).—For erecting Welsh Methodist vestry, not chapel, for the Welsh Calvinistic Methodist Denomination. Messrs. Ivor Jones & T. E. Richards, architects, 18, St. Mary-street, Cardiff:—
J. Parry, Penrhynweiber, Glamorganshire, Wales* £508

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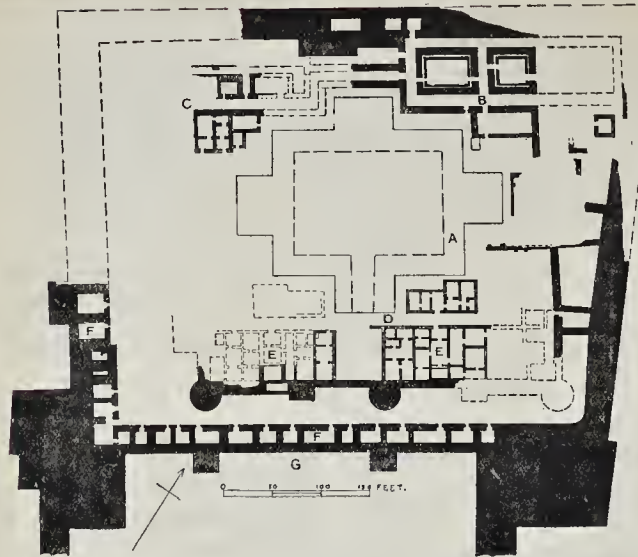


Fig. 6. Excavated Portion of the Parthian Fort.

A—Citadel, Built over Ziggurat.
 B—Governor's Quarters.
 C—Harem.
 D—Street.
 E—Barracks and Houses.
 F—Chambers on the Wall.
 G—Outer Court.

find spacious rooms, some of them built with double walls, and wide corridors, so that the comfort of the chief officer was well looked after; and connected with this section by a corridor was a part of the building which seems to have been set aside as the "harem," or domestic quarters (C). The entrance to the fortress has not been discovered; but there is every chance that it will eventually be found near the north angle, where certain traces of burned brick may be found to represent a part of its foundations. Further excavations may serve also to throw light upon several points that are at present obscure. For instance we do not yet know what means of communication existed between the two courts; and the dimensions of the outer one cannot be ascertained until its walls are cleared of the *débris* that now encumber them. But the work already accomplished shows us that the Parthian builders were skilful in adapting the material they found at hand to suit their own purposes, and that they were no mean workmen.

The palace on the opposite (S.W.) bank of the Shatt en-Nil has been completely excavated, and, although it is a small place, it is full of interest. Its builders worked upon an unencumbered site, and were, therefore, able to lay the place out in accordance with a plan conceived as a harmonious whole instead of being compelled to incorporate any existing structures in their design. Moreover, being upon a smaller scale, the work was easier to set out with some degree of precision; and, consequently, we find its angles more true; while its detail shows an amount of refinement that is lacking in many other buildings at Nippur. But the points that chiefly differentiate it from all the other buildings of the site thus far unearthed are—(a) That columns were employed in it for decorative and structural purposes; and (b) that its architects sought to give

to certain portions of their work the appearance of stone, by a liberal use of stucco. The character of the building is utterly unlike that of any of the Babylonian structures, and, in many respects, bears such a strong likeness to Greek work that it seems almost certain its designer must have had considerable knowledge of the western architecture. The columns, indeed, are quite obviously imitations of the Doric, and, considering the method of their construction, remarkably good imitations too (see Fig. 8).

In the construction of the colonnade, parts of the porch, steps, and thresholds, for fireplaces, and for the floors of some of the best rooms, burned bricks were employed; but the walls were of crude bricks of a similar character to those used in the fortress, but slightly shallower ($7\frac{1}{2}$ in.). That the place was the scene of a conflagration we found ample evidence in the scorched walls and the abundance of ashes and charred timbers. Its exterior, too, had suffered seriously, from the detrition of the mound, but it appears to have been extremely simple; three of its sides were broken by shallow buttresses; but the fourth (the N.E.) was quite plain—a fact which suggests that other buildings abutted against it. The entrance to the building lay almost in the centre of the north-west façade, and was treated with some elaboration. Two steps led up from the street to the raised threshold, and on each side of the doorway was a pedestal, stuccoed with white plaster. Seen from the side these pedestals had a graceful outward curve, their tops projecting beyond their bases. They were about 4 ft. high, and were finished off with pediment formed mouldings in plaster on burnt brick. That they served to support fluted pilasters there is good reason to suppose, for we found traces of fluting in plaster above them; but, unfortunately, the upper portion of the work was lost,

and, owing to the perishable nature of the plaster, there is small hope that future excavations will bring to light sufficient evidence for a restoration of the doorway.

On plan the building was practically a square, each side being about 170 ft. Internally it was divided into two equal portions, one for the men's and public apartments, the other for the domestic portion of the household, the "harem." In regarding the character of the building one is strongly tempted to write "gynaecoon" for "harem," and, indeed, the whole subject bristles with such temptations to draw comparisons with a Greek house. But, for the whole, the palace presents decided characteristics of its own, and we therefore content ourselves by describing it as we found them, leaving the reader to draw his own inferences concerning them. The harem, then, was sub-divided into two sections, one for the use of the servants, stores, kitchen and so forth, and the other reserved for the ladies of the establishment, the quarters of their lord. The architects had planned the arrangement of these three sections very ingeniously, contriving to secure in a manner that ensured the utmost privacy to the women's quarters, and completely isolated the kitchen and its offices from the public portion of the palace. This will become apparent if we refer to the plan (Fig. 7). From the entrance (1) two doorways give access to the two halves of the palace. The one on the west led to the harem; that on the east to the men's quarters. Through an ante-room and loggia (2) access was reached the principal court of the building (5), the small room at the end of the loggia, numbered 4, was probably used as an armoury or gun room. The two columns, which were the antæ screened the loggia, should be noticed on account of their peculiar plan; and it will be observed that the loggia is not situated in the centre of the wall of the court. This court is the most ambitious feature of the palace. Its central portion was open to the sky, but around it was a covered colonnade with four circular columns on each side, and a square one at each angle. It was paved with crude bricks, and between the columns ran a curbing of two courses of burned brick, and the square foundations consisted of eleven courses of the same material. The columns themselves were built up of sector-shaped bricks set in mortar, and were stuccoed with lime plaster. Copies of the Doric, they had, of course, no bases; but for their capitals special moulded bricks were prepared. At the level of the pavement they had a diameter of 2 ft. 9 in., which remained constant for 4 ft. of their height, after which it tapered off to 2 ft. 1 in. at a height of 12 ft. 6 in. The roofing of the colonnade was probably of timber, which we naturally have perished when the palace was burned down. The rooms numbered 6 to 11 were apparently unimportant, while the passage 12, which could be closed by a door at either end, communicated with both sections of the harem through a lobby (20). The principal apartments of this part of the palace lay to the south of the court;

each side the colonnade widened out: broad step with a circular altar upon (5c) led up to the two chief rooms, and 14, between which stood three more steps. This part of the building lay beneath a part of the mound which had been washed almost away by the surface drainage of the mounds, and it suffered from injudicious excavating in the early days of the work; but the restoration shown on the plan is doubtless a correct one.

The other half of the palace could be reached either through the passage (12) from the main court or that (19) which led from the ante-room (18), already mentioned as lying on the west of the entrance lobby. Between 19 and 21, and at both ends of 12, were found door sockets, showing that the approaches to the private part of the palace were used by substantial doors; and it will be observed that the lobby (20), where a porter or eunuch could be conveniently stationed, completely controlled both passages. The servants' quarters call for little notice. In the kitchen (22) was found a fireplace, which bore a striking resemblance to that discovered at Pompeii in the house of Pansa, and was provided with a stone notched to receive a spit and hollowed for a wood

fire. Another door socket at the entrance to 24 seems to point to the small rooms at the west angle having been intended for storing such things as the cook wished to have under lock and key. All the rooms in this quarter were small, and must have been dark. Those in the harem proper, while still small, are more airy. The court (27) was about 28 ft. square, and south of it was a roomy portico, cut off by columns and ante of a like nature with those in the main court. In 34 and 36 were raised platforms of brickwork, which Dr. Hilprecht thinks were probably sleeping places; but the master's rooms seem to have been at 38 and 39. The small room (33) in the angle of the building, being provided with a door socket, may well have been a kind of strong-room, for the doorways of most of the rooms appear to have been closed only by hangings. The last room to be noticed, number 28, was particularly interesting, as it exhibited features which are still found in houses in that region. There could be no doubt that it was intended for a bath-room, for its floor of burned brick was waterproofed with bitumen and carefully laid to drain towards a small circular opening. It would be a puzzle to say where the water went to, but it probably was left

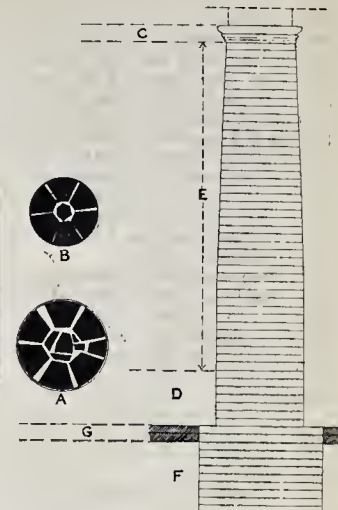


Fig. 8. Construction of Columns in Parthian Palace.

A—Plan at Base. B—Plan at Top of Shaft. C—Capital (restored from fragments). D—Portion left Standing. E—Fallen Portion. F—Square Foundation. G—Two-Course Curb.

to soak into the soil. Around the room ran a skirting of burned brick, also coated with bitumen, which served to keep the crude brick walls from damage by water. At the present day many of the houses in Baghdad have bath-rooms constructed in the same way as this early example; and, although they are hardly luxurious places, they are admirably adapted for a good splashing, which is the best method of taking a bath in such a climate, as doubtless the Parthian builders of the palace knew.

CANTERBURY TOWER.

THE public announcement of the critical state of the central tower at Canterbury, made in a letter from the Dean published this week in the *Times*, will hardly surprise any architect who is well acquainted with the cathedral, and who has studied the appearance of the tower as it can be seen with a field glass (or even without one) from the ground. Mr. Carøe, the architect to the Ecclesiastical Commissioners, had warned the cathedral authorities, on the basis of such examination as could be made without scaffolding, that the tower was suffering from grievous external decay. The tower is now enclosed in a forest of scaffolding, and the detailed examination which Mr. Carøe has now been able to make shows that the state of things is worse than had been realised.

The tower is built of Caen stone, much of which is found to have been face-bedded. Up to the line of the roofs it was the work of Prior Chicheley, who used up a good deal of the stone of the Norman work which he had demolished. This portion, even when exposed to the weather, is in much better condition than the later work above; Norman builders appearing to have taken always remarkable pains to secure the best stone from whatever quarry they drew from, leaving the inferior beds for

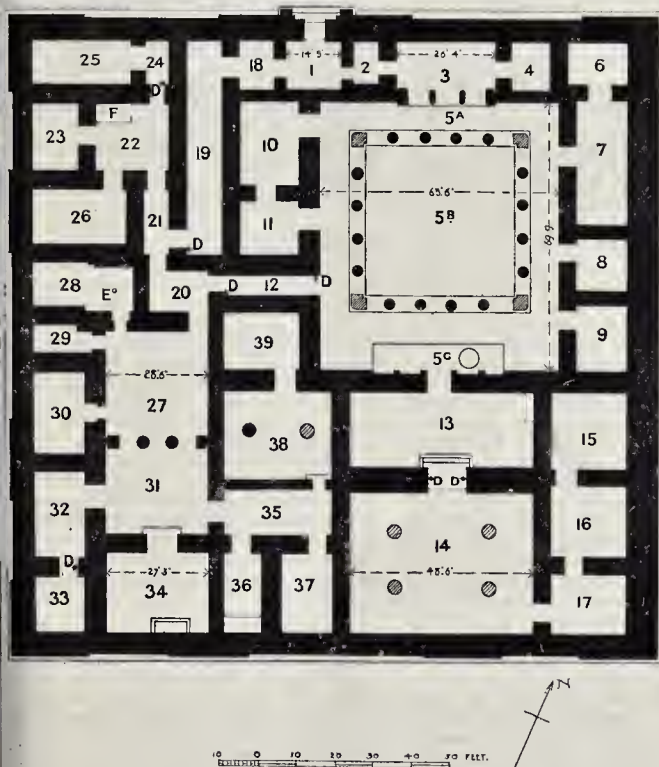


Fig. 7. Plan of Parthian Palace, Nippur (restored).

(Columns shown by shaded lines are doubtful restorations.)

D—Door-Sockets. E—Drainage (Bathroom). F—Fireplace (Kitchen).

1. Entrance. 2. Ante-room. 3. Loggia. 4. Armoury, or Guard-room. 5A. Colonnade, surrounding the Open Court 5B. 5C. Altar on step. 6-11. Minor rooms of men's quarters. 12. Passage to Harem. 13. Ante-room and (14) Principal Hall (Atrium?) of men's quarters. 15-17. Stores, or sleeping places. 18 and 19. Lobby and Corridor leading to slaves' quarters, etc. 21. Kitchen lobby. 22. Kitchen, with fireplace (F), and offices (23-26). 27. Court of the Harem. 28. Bathing-place. 29. Store-room. 30. Sitting (or slaves') room. 31. Portico. 32. Sleeping-room. 33. Store-room for valuables. 34. Women's Hall. 35. Lobby. 36 and 37. Sleeping-rooms or minor apartments. 38 and 39. Master's Apartments.

their successors; hence the often-repeated experience of finding the Norman portions of a building in better preservation than the work of two or three centuries later; though of course the plain and massive nature of Norman mouldings and ornament, and the absence of undercutting, has something to do with its greater longevity. The portion above this level, which is now causing so much anxiety, was built under Cardinal Morton, nominally of the same stone, but evidently of much inferior quality.

Caen stone is a calcium carbonate, and in the present case much of this has been converted into calcium sulphate by the action of sulphuric acid in the air. Where this has taken place the result is that the particles of the stone have lost their cementing matrix, which has been washed out, and are consequently in a constant state of crumbling away. This action of the atmosphere does not penetrate very deep into the surface, and some of the stones which are crumbling on the surface are still sound at a depth of an inch or even half an inch below the present surface. But then the operation goes on from year to year, and when the surface first attacked has crumbled, there is a fresh surface open to attack. Thus some of the buttresses (of which we shall be able to show an illustration next week) are reduced in some places to little more than half their original thickness or projection. The tracery in some of the tower windows has split down vertically, the outer portion being almost ready to drop off. The general condition of the work is forcibly illustrated by the fact that when the tower was first examined from the scaffold there was a summer gale blowing, which in one day brought down on to the scaffold bits of stone to the amount of 90 lbs. weight.

The upper portion of the tower is lined with brick; the bricks, oddly enough, being of a progressively larger size in the upper portions. Besides the want of proper bedding there are various other little weaknesses in construction—want of bond, and pieces of carved work inserted in no connexion with the surrounding masonry. This is more especially the case in the turrets, the construction of which is in some respects more like that of joinery than mason's work. A curious point here is that the gablets round the turrets are capped with small bars of iron, as if intended as a preservative to the stone ridges of the gablets; the iron does not cap over the stone, but is merely a bar laid along the top edge where the two slopes meet. The tower is at present the abode of swarms of insect life, colonies of which have developed in the interstices left by decayed stone.

The south and west faces of the tower have suffered most, the west especially; this is what was to be expected, these being the wet aspects; the north and east faces are the blackest in appearance, but are in better preservation.

The problem now is, in the first place, to cut out stones which are decayed past preservation, and insert similar new ones. Doulting stone is to be used for this, as being more durable than Caen without presenting any very marked contrast to the eye. One may be sure that under Mr. Carcè's superintendence this will be done in the most conservative manner,

and that not a stone will be removed unnecessarily. The next and perhaps most important task is to treat the whole external surface of the masonry with something which will arrest the process of disintegration, and will supply to some of the stone the cementing material which it has lost, and prevent the rest from being disintegrated and washed out further. What this application is to be is a point on which the eminent chemical experts who have been consulted are not at present entirely in agreement; experiments are in progress which will probably afford ground for an ultimate decision; but we are not in a position at present to say anything further on this head.

We can hardly doubt that the country will rouse itself to provide the funds necessary for carrying out the work of repair. Though the tower is in a late and not very valuable style of Gothic, it is architecturally of the highest importance as the grand centre mass of the composition; and Canterbury Cathedral has a history so venerable and so important—it is so closely connected with our national history, that it must surely be felt by everyone that the preservation of its crowning feature is a work of national and not merely of local or diocesan interest.

NOTES.

British
Canal
Conference.

We have referred at various times to the desirability of rescuing English canals from the parlous condition into which they have fallen. That the same opinion is generally entertained by the trading community is evidenced by the action of many chambers of commerce, deputations to Government departments, and the introduction of Bills during the past two Parliamentary sessions. The conference held last week in Manchester still further emphasises the importance of this great national question. According to the latest returns the total length of canalised rivers and artificial canals in the United Kingdom is 3,856 miles, exclusive of ship canals, and of this mileage nearly one-third has been acquired by sixteen separate railway companies, with the sanction of Parliament, undoubtedly for the purpose of killing competition, the remainder of the canals belonging to some eighty independent companies. Apart from this divided ownership, the canals have been constructed so that through traffic can only be conducted under considerable disadvantage, owing to the absence of uniformity in the width of channels and locks, which was permitted by the inattention of Parliament when the various Bills were passed. Consequently, although the English canals run through valuable routes and are more or less inter-connected, they could not be regarded as forming a complete system capable of efficient competition with railways, even if amalgamated and placed under the administration of a single authority. At the present time it would be very difficult to effect a complete amalgamation without the intervention of Parliament. The railway-owned portions would have to be acquired compulsorily, and the whole of the waterways to be repaired and remodelled,

so as to constitute a complete national system open to barge owners and carrying companies at reasonable tolls. The cost of acquiring all existing canals would amount to nearly thirty-five millions, while the necessary improvements and the application of electric power for haulage would cost several millions more. Hence, only a really effective solution of the problem appears to be presented by a scheme for nationalisation of the canal system, and its administration in such a manner as to provide a cheap and convenient means of transport to the benefit of the public.

The
Building Trade
in 1903.

THE Report of the Board of Trade on wages for the year 1903 shows that the building trade—so far as concerns workmen—has been less flourishing than in previous years. The average percentage of employed was, for example, 4.9, as compared with 4.3 in 1902, 3.7 in 1901, and 2.5 per cent. in 1900. We, therefore, have a steadily increasing rate of unemployment. Again, in 1902 15,375 workmen had their wages changed, but in 1903 the number was only 4,638, which is the lowest figure since 1893. These changes are practically increases, since out of the number for 1903, 4,106 represent an increase—a diminution, therefore, if change means a diminution in the right direction. On the other hand, one must bear in mind that business will not bear a constant increase of wages, and we may fairly expect a decrease in change or increase of wages to some extent to the fact that the increase of wages cannot be further raised, present at any rate, without stopping employment. This is one of the points which artisans are inclined to forget. A consumer cannot stand more than a certain price, and if workmen go asking for increases the consumer fastens up his pocket, and work decreases. Increases of wages do not continue.

The
Premium
System.

ALL who have at heart the true interests of the British workman and of British industry must unite in regretting the perverse folly of the Engineers and Shipbuilding Trades Federation in reporting against the premium system. The autocratic rulers of trades unions, into whose hands workmen blindly commit their bodies and souls, object to everything that is calculated to benefit employers and men alike. Their faith seems to be as simple as it is mistaken. They regard the total amount of work obtainable as a quantity that cannot exceed a certain maximum value, although it may be below the limit. Starting with this false basis, they say in effect:—Let every man have his mathematical share of the work, let no man do more than his share, let capable fellows, and let all men avoid the snares devised by employers to ensnare the skilful and industrious men to earn more money than those who are incompetent and lazy. The unions wish the standard day's work to be measured by the minimum output of the most incapable among their members. On the other hand, employers know that by the exercise of enterprise the trade of the country can be increased with a corresponding increase of labour.

premium system is one method devised for encouraging men to do their best for themselves and the land of their birth. It allows all real workers can add to their wages by amounts proportionate to the skill and energy displayed, and, while affording immediate and direct benefit in this way, they are laying up for themselves future sources of wealth by helping to increase the trade of the country and consolidate markets for British products. Thousands of workmen recognise the correctness of the principles we have advocated, but their glib-tongued leaders, who prefer talk to honest work, do their best to burke every movement that seems likely to draw employers and men into the bonds of harmonious co-operation. Hence the adverse decision recently promulgated against the premium system.

The Dee Embankment. ON the day following the publication of our "Note" last week on this subject the sea broke entirely through the Dee embankment within a mile or two of Postyn Station, flooding the land as far as the railway. Some forty or fifty yards of the embankment, which we described as having been seriously damaged, were swept away, and subsequent action of the tide has further widened the gap. Thus it is evident that the action taken by the railway company for the protection of their works was only just in time to guard against the most serious consequences. Serious portions of the embankment on which the permanent way is laid have already been protected by clay, and opposite the gap large quarry-stones have been built into the slope. Stoning will probably be required along other parts of the line as the sea-wall succumbs to tidal action. It seems a pity that something cannot be done to save the land bordering the quay, but so far as we can judge the owners appear to think the loss of their property is a matter of smaller concern than the expense of repairing shore defences. The small value of land adjoining the sea is one cause of the indifference exhibited towards coast-protection works in many parts of the country.

The Paris Metropolitan Railway. RAPID progress continues to be made towards the final realisation of the extensive scheme of underground railways in Paris, and we now learn that the third line is already so far advanced that it will probably be opened for traffic before the end of the present month. During the whole of the summer the Place de l'Opera has been disfigured by hoardings surrounding the site of the railway station, but this obstruction has at last been removed, revealing a handsome boulevard around the open space leading to the underground station. This work is in complete harmony with the architectural character of its surroundings, and the entrance to the railway is free from the somewhat unartistic features characterising many of the underground stations in other parts of the city. The businesslike manner in which all the details of the great metropolitan system have been definitely settled in advance must be envied by Londoners, whose traffic

facilities have always been left more or less to chance or to undirected private enterprise. Some day, after the report of the Traffic Commission has been presented, we may have a public body capable of dealing authoritatively with the pressing question of rapid transit. In the meantime Paris continues to act, while we are obliged to wait for the formulation of foregone conclusions, and afterwards shall have to wait for the commencement of works that have been sadly needed for years past.

The Disfigurement of Clifton. We have more than once referred to the wretched vandalism by which one of the most beautiful and romantic spots in all England, the view over the Avon from the Clifton side, is being ruthlessly destroyed for the mere sake of quarrying a not very valuable stone, of which there is plenty more to be had elsewhere. The Clifton Improvement Association had the matter under consideration at a meeting held last week. Their secretary stated that the once beautiful wooded bank "would shortly become one series of quarries unless something were done." We fear that the beauty of the scene is already much spoiled; it ought never to have been touched; and the owners of these woods, in their desire for gain, do not seem to reflect that they are destroying the very attraction which draws visitors and residents to Clifton. As one speaker said, "if they carted away the scenery they would not get people to come to Clifton." The intended formation of jetties on the river for shipping the stone has been made a lever in opposing the work, as it is objected that the Avon is too narrow a river to have its traffic impeded by a number of jetties. That may be useful as a weapon of opposition, though it is beside the mark. The real point is that a scene of exceptional beauty is being deliberately and selfishly destroyed.

Traction Engines in Cities. WHILE ready to agree with the more extended employment of motor vehicles in cities and large towns, for sanitary, humanitarian, and other satisfactory reasons, the inhabitants of London and other large centres of population are united in objecting strongly to the unrestricted use of heavy road locomotives for the haulage of merchandise. Titanic engines of this type, followed by a train of lumbering waggons, bring a new terror into the daily—and, for that matter, the nightly—life of the resident in and near every large town. They threaten the foundations and damage the surfaces of streets and roads, shake houses from top to bottom, snort hot ashes upon the heads of the people by day, and make noise enough to wake the dead by night. The Commissioner of Metropolitan Police has no jurisdiction over the nuisance in the absence of any specific breach of the law, but county and borough councils have powers to make by-laws for the regulation, and even for the prohibition, of traction-engine traffic within their respective districts. We are pleased to find that the London County Council have now convened a conference of metropolitan borough councils

with the object of considering a new set of regulations for the adequate control of traction engines in general, and their exclusion from certain crowded highways in particular. For our own part, we doubt the necessity for the employment of such clumsy engines in urban districts, except in very special cases, and feel sure that all ordinary requirements could be met by the use of motor vans, which are comparatively unobjectionable, or, at any rate, not more objectionable than the ordinary two-horse waggon.

The Accident at Old Bailey Buildings. THE inquest held on the body of F. J. Housden, the unfortunate man who died last week from the effects of injuries caused by the fall of a block of stone that was being hoisted at the Old Bailey buildings, led to the usual recommendations from the jury to the effect that "more efficient provision should be made" for safety in hoisting stones, etc.; and by implication to the condemnation of the "lewis" as a means of hoisting heavy stones. If the coroner's jury had no clearer idea of the principle of the lewis than that conveyed by the reports in the daily papers, one of which described it as "a two-pronged piece of iron which was placed in a hole made in the stone, while a wedge was driven down between the prongs to tighten it up," it is no wonder that they thought it an inadequate way of securing a stone. The fact is that, except in the case of a soft and friable stone, the lewis is the safest way there is of temporarily attaching and raising a large block; if it is properly done, it is absolutely impossible for a lewis to give up its hold except by the breakage of the stone. In the case under notice we are informed that the hole had been cut a little large for the lewis, which accordingly had been packed up with a couple of thin slips of metal; and that Housden, for some inexplicable reason, took these out before the stone was sent up. That did not prevent the lewis holding, but it would give it some degree of play in the hole, and when the man jumped on to the stone (which was 4 tons weight), the shock sufficed to pull the lewis out, owing to it not being fitted tight. It was a case of bad workmanship. The public should understand that the very principle of the lewis is such that it is a fastening that cannot break away, provided that it is properly fixed in the first instance. It is much safer than slinging a stone in a chain, which we never see in a crowded street in London without some anxiety; for should the stone cant, there is considerable danger of it slipping. We understand, however, that at the Old Bailey work it has been decided in future to hole the larger blocks of stone for two lewises instead of one.

Flexure of Concrete-Steel Beams. BEARING in mind the different views entertained relative to the precise action of concrete-steel, and to the most suitable method of calculating the strength of beams composed of this new material, considerable interest attaches to the paper presented by Professor Talbot at a recent meeting of the Western Society of Engineers, Chicago. With the object of discovering the effect of certain

conditions, and of opening the field for further investigations, a series of tests was undertaken by Professor Talbot, in the Laboratory of Applied Mechanics of the University of Illinois, and a summary of the results is to be found in the communication to which we refer. In addition an analysis is presented, in the hope of placing calculations upon an improved basis. One important point which we are glad to see recognised is that the constants E_0 and λ_0 —the initial modulus of elasticity of concrete in compression, and the unit deformation in the most remote fibre of the concrete, respectively—require to be determined for a variety of concretes. It is undoubtedly the fact that much has still to be learned as to the internal condition of concrete when subject to stress. Study may also be made with advantage for the purpose of ascertaining whether the modulus of elasticity of steel encased in concrete is the same as that for steel not so enclosed. These and other points are commended by the author to the investigations about to be undertaken by the joint committee of the American Society of Civil Engineers, the American Society for Testing Materials of Construction, the American Railway Engineering and Maintenance of Way Association, and the Association of American Portland Cement Manufacturers. We very much regret that none of our own scientific institutions appear to take any interest in concrete-steel, being content to allow their members to obtain information second-hand through American and Continental sources.

In some property of about 37 acres of building land at Woodhall Spa and Tattershall, Lincs. Woodhall Spa, near Horn-castle, in the parts of Lindsey, which is placed in the market, is a ruined structure known as the "Tower on the Moor." It stands in the midst of the marshland traversed by the river Witham and the Foss Dyke navigation that extends to Kirkstead and Tattershall. Forming a conspicuous landmark, the isolated tower consists of a brick building, octangular on plan, having a winding brick staircase and rising to the height of about 60 ft. It appears that the tower was erected as a redoubt or conning-tower for the castle at Tattershall, on the river Bain, little more than four miles distant. It was constructed in the XVth century, and reputedly by Sir Ralph, fourth Baron Cromwell, whom Henry VI. made Lord High Treasurer of England in 1433. The red-brick masonry is very similar to that of the castle which Sir Ralph built at Tattershall—a once strong fortress greatly injured at the time of the Civil War. The rectangular keep, 89 ft. by 67 ft., having walls 16 ft. thick at their base, and battered, is 112 ft. high. At the four angles are octangular turrets, with their battlements machicolated. The ground floor is carried by massive groined arches; the stairs, of 181 steps, in the south-east turret, lead up to the fourth story, on which is a covered projecting platform or gallery, with a parapet pierced with embrasures and embattled. In the thickness of the east wall are curiously-arched galleries communicating from the stairs to the principal apartments. The sculpture about the open fireplace on the main

floor embodies the treasure-bags, coat-of-arms, and motto of Cromwell, as at Collyweston Hall, Northamptonshire, begun by him and finished by Margaret Countess of Richmond. The inner foss or moat has a facing of brickwork; in the outer moat stands the cruciform church of Holy Trinity, for which Sir Ralph founded a college of priests. The Cromwell monuments include the brasses of himself and his wife Margaret Dayncourt, 1454-5. Nearly all the fine glass in the choir was removed, 1754, to St. Martin's, Stamford Baron.

Recently Deceased Artists.

OUR Obituary column records this week the deaths of three artists of note—Mr. G. A. Lawson, sculptor; Mr. Colin Hunter, oil-painter; and Mr. Walter Severn, water-colour painter. Of these three, the decease of Mr. Colin Hunter occupies the mind of the public and the art critics in by far the largest proportion; he was a popular and always a well-placed exhibitor at the Royal Academy, and his pictures were such as appealed to the general eye; but in our view Mr. Lawson is artistically by far the most important loss of the three. Sculpture is a less popular art than painting, and Mr. Lawson was not a man to achieve popularity; he was of a very quiet, modest, and retiring character, wholly given up to his art, and not seeking any social or artistic advancement; but his best works in sculpture were of a very high class both in ideal and in execution; and his "Death of Cleopatra," which we believe never got further than clay and plaster, was a work of the greatest pathos and of monumental dignity of style. Its merit was recognised by the Academy in placing the plaster model as the central object in the octagon the year it was exhibited; and other works, especially his marble of the "Spartan Dancing Girl" (perhaps in point of style and execution his finest work) were repeatedly placed in prominent and honourable positions at Burlington House. Why, with these qualifications, he was never elected a member of the Royal Academy has always been a mystery to us. Mr. Colin Hunter we think a somewhat over-rated painter; he had mastered an effect of his own in sea and coast painting, but the style of his art was rather superficial, and his effects were rather categorically repeated. Mr. Severn, as appears from our obituary record, was something more in connexion with art than a painter in water-colours (in which capacity he was best known to the public); he had a considerable influence in developing a taste for better forms of applied art; and it was perhaps rather in reference to his general culture and influence than to his water-colour work that he was elected President of the Dudley Gallery Art Society. He began water-colour as an amateur, and the amateur element was rather obvious in his work throughout.

Royal Academy Lectures.

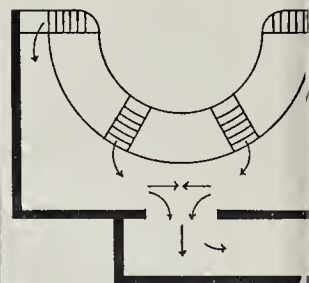
THE syllabus of lectures to students at the Royal Academy, for the Session 1904-5, announces a course of four lectures on painting by Professor Clausen, to be delivered on January 9,

12, 16, and 19. The subjects are "Style in Nature," "Style and the Ideal," "Invention and Imagination," "Taste." After the brilliant series of lectures (since published in book form) which Professor Clausen delivered in the last session, his ensuing course of lectures will be looked forward to with interest, both by the students and those of the general public who are desirous to obtain admission to them. The titles and subjects of lectures to be delivered on sculpture and architecture are not yet announced.

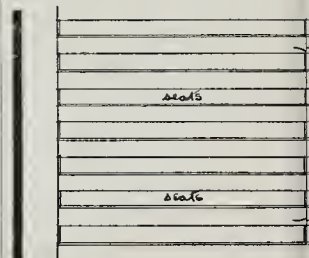
SUGGESTIONS FROM NEW ZEALAND THEATRE PLANNING.

THE following is an abstract of a paper by Mr. S. Hurst Seager, architect, of the Church, New Zealand, at the Australasian Science Congress held in January last at Dunedin. The abstract of the paper forwarded to us along with the accompanying diagrams. The paper had special reference to the provision of exits and escapes at the places of amusement. No more important problem presented itself to the architect, Mr. Seager, than this, yet there was none of the less successfully solved. The problem was not to design a building in such a way that an audience might leave it without discomfort under ordinary circumstances, but to design one which would be free from danger in the event of a panic, arising either from alarm of fire, earthquake, or other cause. It had to be borne in mind very clearly that the problem was to be solved by demanding on the part of the audience a certain course of action under unusual circumstances, for at that time they were incapable of thought and incapable of determining what action to take. The problem therefore was to plan a building which should be so arranged that without choice irresponsible people would be compelled to move in a certain direction, and that that direction should be absolutely free from all resistance. Where resistance there could be no pressure; where pressure there could be no danger. It was neglected of this fundamental principle which has been the cause of such sad loss of life in the past, and its continued neglect would be responsible

EXITS FROM SEATING



CIRCLE



STALLS

Showing pressure at footways

Fig. 1.

all that took place in the future. The first impulse of most of the audience at the time of imagined danger was to rush from their seats towards the entrance from which they approached (see Fig. 1). That at once made it perfectly clear that the usual entrance must in all cases be the exit, and safety did not depend at all upon any number of so-called special "escape doors." These were simple delusions, and should not be provided. There must be entrances, carefully calculated as to number and width, leading to different parts of the building, to be used both as entrance and exits for that part only, and the greatest care should be taken that each entrance should give uninterrupted communication between that portion of the building for which it was designed and the open street. It could not be too firmly insisted upon that there must never be any connexion whatever between one corridor of communication and another. Each entrance and exit should be perfectly independent of all others. To carry this principle into fully every building of entertainment should stand wholly detached with sufficient space round it to prevent any chance of blocking. Very many Continental theatres were so placed, and most decidedly no new building should be designed which had not a perfectly free, even space on at least three sides.

These spaces should be kept free during a performance. Carriages should always be drawn up sufficiently far away to allow of a free rush of people from the exits, for a very great danger existed in allowing carriages to stand at the edge of the pavement directly opposite the only means of egress. Gutters at opposite ends and steps outside entrances were so sources of danger which should certainly be got rid of. Special provision should always be made for those using conveyances, so that they could reach them without interfering with the flow of foot traffic or of being inconvenienced by it (Fig. 2). In order to avoid any resistance in passing from the seats to the corridor or roadway, provision should be made so that the streams of people approaching the doorway from different directions could be directed through it without conflict with the opposing streams. This could be effected by means of curved barriers, which he had designed (Figs. 3 and 4), arranged so that any pressure exerted by the people behind would force those in front out against other people, but only more quickly out of the building. The seats should always be placed, and the rows should be a sufficient distance apart to enable persons to walk easily between them. The corridors should be of even width throughout, perfectly smooth, and any change of direction should be made by curved surfaces. The sum of the widths of the openings

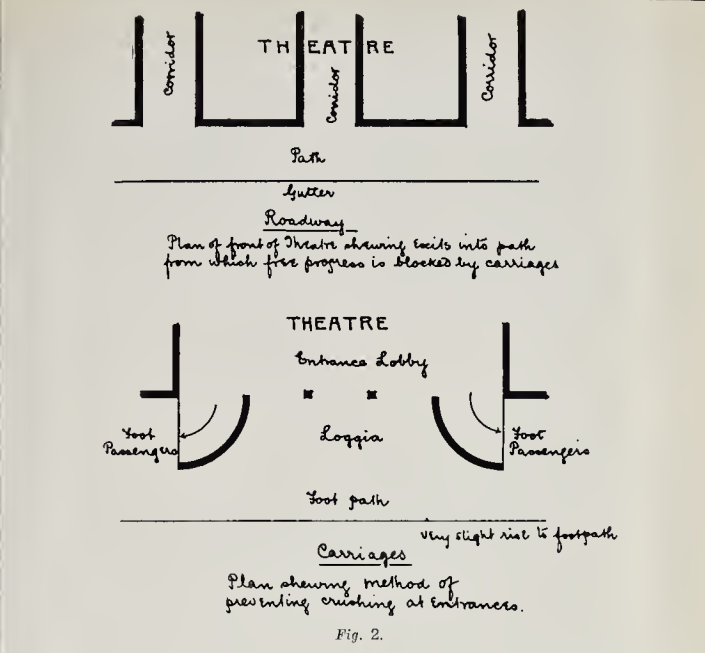


Fig. 2.

into any corridor should not be greater than the width of the corridor itself, and the stream of people entering it through any opening should be prevented by barriers from interfering with the progress of those entering it through other openings, for the greatest danger existed in allowing a stream of people to enter a corridor at right angles to the stream of people already pressing along it. Sliding doors into corridors should never be permitted, but all doors should be hinged to open in such a way that the progress of a stream of people pressing outwards will not be impeded. Staircases should be of even width, and designed with curved surfaces as corridors according to the London County Council rules. The steps should be of equal width throughout, and the flights should be easy, of equal length, and contain no

more than eight steps. His own experience led him to the conclusion that easy steps, built in a staircase of even curvature throughout, were much more safe (Fig. 5). Either form might be safely used, but irregular stairs of any kind should be strongly condemned. All stairs and corridors should be of fireproof material. For the walls, steps, floor, and ceilings, events had proved that it was much more essential to safety to scientifically design the entrances and exits than to insist on fire-proof construction throughout. The lecturer also drew attention to the danger of loose chairs for sitting accommodation, as they impede the traffic in leaving a public place of entertainment. In conclusion he moved:—"That this section of the Australasian Association for the Advancement of Science is of opinion that places of entertainment and

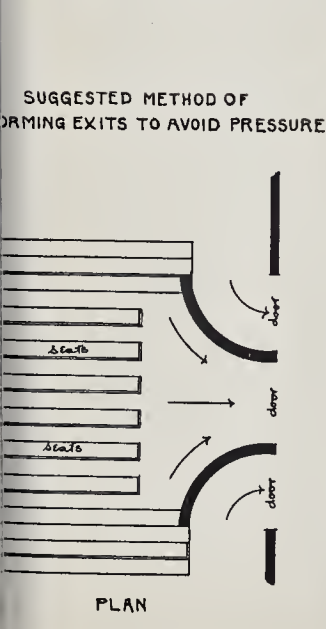


Fig. 3.

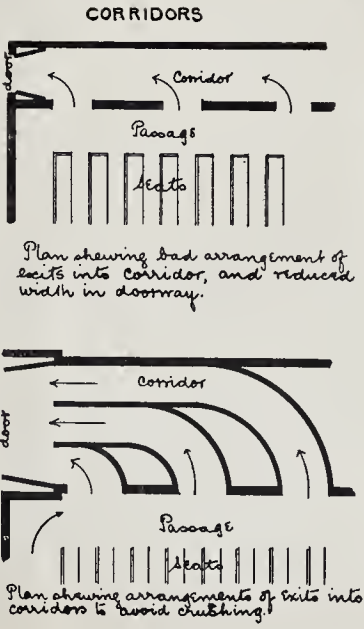


Fig. 4.

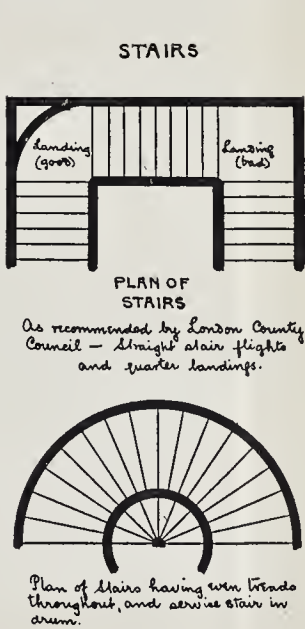


Fig. 5.

public assembly, in order to be considered safe against the dangers arising from panic, must be designed in accordance with the principles here set forth and shown in the accompanying diagram."

It was decided to refer this resolution and the following to the consideration of the General Council:—"That the Architectural and Engineering Section of the Australasian Association for the Advancement of Science, recognising the urgent necessity for the planning of all buildings used as places of entertainment and for public gatherings in such a manner that the safety of the public may be ensured, wishes to bring before municipalities the principles upon which such works should be designed, as embodied in the foregoing resolutions, and would urge that a licence be not granted to those buildings which do not fulfil the conditions stated, and that a copy of the above resolutions be forwarded to all Australasian municipalities."

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A LANCASHIRE and Cheshire district meeting of the Association of Municipal and County Engineers was held at Withington on Saturday, September 24. The district will soon form part of Greater Manchester, the amalgamation taking effect in November, and the meeting on Saturday gave evidence that the larger city will absorb a prosperous and progressive district. Mr. A. T. Davis, County Surveyor of Salop, President, was in the chair, and among those present were Messrs. J. P. Barber, Islington; A. D. Greatorex, West Bromwich; J. Corbett, Salford; H. Mountain, Withington; J. Cartwright, Bury; A. Burton, Stoke-upon-Trent; A. Dodgeon, Clayton-le-Moors; J. S. Sinclair, Widnes; G. Green, Wolverhampton; R. Simmons, Little Woolton; H. Shillington, Lurgan; C. Hall, Droylsden; C. Brownridge, Birkenhead; S. S. Platt, Rochdale; W. Holt, Sale; V. W. Lathwaite, Turton; G. M. Collins, Withington; A. J. Price, Lytham; T. W. A. Hayward, Battersea; S. S. Haywood, Brighouse; R. Pierce, Singapore; J. Swarbrick, Withington; A. M. Fowler, Manchester; and J. Johnson, Rawtenstall.

Mr. Turnbull, chairman of the Urban District Council, offered a most hearty and cordial welcome to the members of the Association. In a few weeks the district would be merged into one of the greatest cities of the kingdom, but he hoped they would come to the conclusion that the District Council had been progressive.

The President, in acknowledgment, congratulated the Council on the step they were about to take in joining Manchester. He then made announcement of the death of one of his predecessors in the Presidential chair, Mr. Escott, of Halifax. The Council at their meeting the previous week passed a resolution of condolence.

Mr. S. S. Platt proposed the re-election of Mr. Brownridge, of Birkenhead, as hon. sec. for the Lancashire and Cheshire district.

Mr. E. Spencer Yates, Waterloo, seconded, and it was carried unanimously.

Mr. Brownridge, in acknowledging his re-election, promised to do what he could to make the district one of the most active and energetic in the Association.

Municipal Works, Withington.

Mr. A. H. Mountain, Assoc. M.Inst.C.E., read a paper on the municipal works of Withington; with a description of the new sewerage system and sewage outfall works, on the double-contact bacterial system. He said the area of the Withington Urban District Council's district was 5,728 acres, and the population at the present time was estimated at 40,000. It was situated adjoining the southern boundary of the city of Manchester and the urban district of Moss Side, and might be considered to be the principal suburban residential district adjoining the city. The rateable value was 258,888 $\frac{1}{2}$. The district being mostly of a residential character, tar macadam had been much in favour during recent years, but the author from his experience had not found it altogether satisfactory, and considered that it should be used only in streets of light traffic. He had found the difficulty of repairing this class of road to be very great, since it could only be carried out in suitable dry weather, and had also found it to be expensive. Its advantages were, no doubt, great in a residential district such as Withington, where quietness might reasonably be considered to outweigh the dis-

advantages of its cost. Various specifications for tar macadam had been adopted from time to time, but the most satisfactory material consisted of limestone, granite not having sufficient affinity for the tar composition. The refuse destructor was erected in 1895 to the author's designs, and cost 7,105 $\frac{1}{2}$, including land (857 $\frac{1}{2}$), sewerage, and road making. It consisted of six cells in one range. As originally designed, a multitubular boiler, 11 ft. by 7 ft., was provided to drive a mortar mill and dynamo for lighting the works. The cells were worked by natural draught, the top of chimney being 150 ft. above ground level, and having an interior fire brick lining 4 ft. 6 in. diameter to a height of 80 ft. Amount of refuse consumed in each cell per day of 24 hours was 5 tons. Three stokers were employed on the day shift, and two at night. In November, 1897, owing to the high price of flags, and in order to make use of the clinkers from the destructor, the author recommended the Council to lay down a hydraulic plant for the purpose of making concrete flags. The scheme was adopted and the plant duly installed. The manufacture of flags commenced in September, 1898, since which time it had been continuously proceeded with. The hydraulic presses and plant were supplied and erected by Messrs. Fielding and Platt, of Gloucester, and had been very satisfactory in their working. The various main roads and highways, and also private streets, had been paved with these concrete flags, which were very satisfactory in colour and durability up to the present time. The cost of making them amounted to 1s. 11 $\frac{3}{4}$ d. per super yard. The proportion of materials used in the flags (by measure) were as follows: For the face of the flag ($\frac{3}{4}$ in. in thickness) 1 part granite chippings, 1 part of sand, 1 part of best quality Portland cement. The body of the flag consisted of 3 parts of ground clinkers (crushed in the mortar mill), 2 parts of clean sharp sand, and 1 part of Portland cement. The flags were all made 2 $\frac{1}{2}$ in. thick, and were allowed to mature for at least six months before being used. The total cost of the plant and buildings connected therewith amounted to 2,250 $\frac{1}{2}$. The new tramways were worked by electricity by the Manchester Corporation, the Council having entered into an agreement with the Corporation to lease them for a period of twenty-one years, commencing December 1, 1902, at a rental of 600 $\frac{1}{2}$ per mile of single tramway. In order to provide for the double line of electric tramways, it was found necessary to widen Palatine-road from 42 ft. to 54 ft. in width for a length of 1,100 yards, and reconstruct the roadway and paths throughout. This involved the purchase of portions of the gardens of various properties along the road on the west side, the setting back and rebuilding of the whole of the boundary walls, and the replanting of gardens and shrubberies, the total cost amounting to about 17,000 $\frac{1}{2}$. The permanent way consisted of girder rails weighing 102 lb. per lined yard, laid on Portland cement concrete, this being 18 in. wide and 9 in. deep under each rail. The paving was of Welsh granite setts 6 in. deep, the joints being raked with gravel, and grouted with pitch composition. The work was carried out by the Manchester Corporation Tramways Department, acting as contractors for the Withington Council. The cost per mile of single line was 5,620 $\frac{1}{2}$. The Council had obtained a Provisional Order, confirmed by Parliament, for the supply of electricity for public and private purposes within the district, and had transferred the same to the Manchester Corporation for a period of thirteen years, the Corporation undertaking to supply electricity to ordinary consumers on the same terms as it was supplied to ordinary consumers in the city. The gas supply for the greater portion of the district was obtained from the Manchester Corporation at a charge of 2s. 9d. per 1,000 cubic ft.; no meter rent was charged. The water supply was obtained from the Manchester Corporation. In June, 1899, a special meeting of the Main Drainage Committee adopted the scheme of the author (subject to the modifications suggested by Mr. Mansergh) for main sewerage outfall works, and he was instructed to prepare amended plans and estimates. In September, 1899, summonses were served on the Council, on the information of the Mersey and Irwell Joint Committee, for offences contrary to the provisions of section 3, Part II., of the Mersey and Irwell Joint Committee Act, 1892.

In the same month, the author submitted his

revised plans and estimates of cost of the sewers and sewage works, amounting to 86,455 $\frac{1}{2}$, and they were approved, application for the necessary loans ordered. The Local Government Board inquiry into proposed loans was held on November 18, 1899, by Mr. H. H. Law, M.Inst.C.E., later, interviews took place between the Government Board and the chairman of the Main Drainage Committee and the author and in consequence of the requirements of the Local Government Board, the estimates were again revised and increased to 133,615 $\frac{1}{2}$ June, 1900. Sanction to the loan was given July 14, 1900, and contracts were let to James Byrom, of Bury, for sections 1 A (outfall works), and to Messrs J. D. Newell Sons for contracts 3 and 4 (main outfall sewers). These contracts were all now completed, the works in operation. The author found it necessary, in order to carry out the scheme double contact bacterial beds, to raise sewage to 78-00 O.D. at the outfall works and in order to avoid pumping the water arranged the new outfall main sewers to gate the sewage of the upper zone of the district and the whole of the Levenshulme sewer leaving that from Didsbury and Chorlton-Hardy only to be pumped. The sewage from Chorlton-cum-Hardy was at the extreme western corner of the district, and was bound by the river Mersey on two sides, south-west, the Chorlton brook on the north, and an embankment on the east. The average level of the surface of the farm, as complete in 1884, was 71-75 above O.D.; this was practically level throughout, the variation 1 in 10 within 1 ft. either way from the above altitude. Moreover, the river Mersey rises at flood tide to about 81-00 above O.D., or to a height of 9-25 above the surface of the land. Difficulties attending the construction of sewage outfall works under these circumstances might be imagined. The alternative was to pump the whole of the sewage, a large portion of the storm-water, upon a suitable site; but, owing to the proximity of the population, and the fact that all available sites along the river had been already appropriated for the purposes of sewage treatment by other authorities, the author considered it impossible to suggest any other site than that already used by the Council as a sewage farm. The author estimated the population due to the works at the present time at 54,000 there being 40,000 in the Withington district and 14,500 in Levenshulme, and the present weather sewage flow at 3,000,000, or 4 gallons per head per day. Of this volume probably, 50 per cent. was sub-soil water which passed into the older defective sewers and drains. About half the above volume delivered by the high-level sewer at the outfall works at 78-0 above O.D., and the remainder from the low-level sewers, was delivered at 71-0 above O.D., into the pumping station at the sewage works, was lifted into a high-level channel adjoining the engine-house by centrifugal pumps. The steam-ran plant consisted of two Lancashire boilers. Each unit was capable of consuming 26 tons of asphalt refuse per twenty-four hours and of providing the steam for the whole of the works, and they were worked alternately. The pumping plant consisted of four A.E. engines and direct driven centrifugal pumps supplied by Messrs. Tangye, of Birmingham. The sewage on arrival at the outfall works was delivered into detritus tanks, of which there were two, each having a capacity of 48 gallons. In these tanks were deposited heavy grit and coarser particles held in suspension by the sewage. From these detritus tanks the sewage passed forward into sedimentation tanks, where further deposition of the finer solid matters took place. On way to these tanks the sewage passed through blocks of aluminiferous placed in the channel and the sedimentation was thereby materially assisted. The sedimentation tanks had capacities of 377,355 gallons and 408,650 gallons respectively. From the sedimentation tanks the sewage passed to the first contact bacterial beds along concrete channels 7 ft. wide. detritus and sedimentation tanks were provided with floating arms 12 in. diameter communicating with a conduit leading to a pumping sump, so that the top water might be taken off whenever it became necessary to convey the sludge from any one of the tanks. Each tank was also provided at its top and deepest part with a valve, communicating

an open channel leading to the sludge tank, which adjoined the western end of the buildings, since the sludge was lifted into the rams and seas. The sewage was held in contact about 24 hours, and was then passed by Ridgeway screened valves to the second contact beds. The author was pleased to say that the results of the treatment of the sewage since the works had been fully in operation was most satisfactory, the latest published results, on July 14, of analyses made by the official analyst of the Mersey and Irwell Committee showing the effluent first on the list of those from the Mersey and Irwell watershed.

Sewerage and Sewage Disposal Works.

Mr. J. Swarbrick, M.Inst.C.E., read a paper on sewerage and sewage disposal works. The paper was mainly a description of the schemes for sewerage and sewage disposal at Withington which preceded that recently executed. Dealing with the present scheme, he said that during 1895 it became imperative for the district council to proceed with works for the prevention of flooding in many parts of the district, as well as to satisfy the requirements of the Mersey and Irwell Joint Committee regarding the quality of the effluent. About that time the author was asked to accept the Chairmanship of the Main Drainage Committee. Forthwith Mr. Mountain was instructed to formulate a comprehensive scheme, and in September, 1897, his first scheme was submitted. Although only seven years ago, very little was then known of the practical application of bacterial treatment to the purification of water-carried sewage. That method of treatment had not then advanced beyond experimental stages. In his first report Mr. Mountain advised chemical precipitation and subsequent filtration through land, which was a method then favoured by the Local Government Board wherever sufficient land for filtration purposes could not be obtained. Those who had been studying the vexed question of sewage treatment were becoming conscious that they were upon the verge of a new era. The distinction between mechanical and bacterial sanitation had been discerned. The advocates of the biological treatment of sewage in artificially-constructed filters, now known as "bacteria beds," were showing marvellous experimental results. The discovery that local authorities unable to acquire sufficient suitable land for sewage purposes could, without the aid of treated precipitants of mediums for filtration, merely clarify, but, in fact, substantially purify water-carried sewage had, in the past years, completely revolutionised our ideas regarding sewage treatment. Personally, the author could not, in 1897, approve of any scheme of chemical treatment, plus land filtration, because there was no financially practicable method of chemical treatment known which could have been relied upon to produce an effluent free from liability to set up secondary decomposition. The proposal to improve the effluent by subsequent filtration through the land available was likewise not feasible, in consequence of the highly-polluted condition of the "sewage-sick" soil. The only conceivable way of proceeding would, if suitable land had been obtainable at a reasonable expenditure, have been to acquire a vastly increased area. That was believed also to be impossible. It was under those circumstances that the author insisted that attention be paid to the study of bacterial methods of treatment, and that the whole question should be referred to some independent eminent engineer having had municipal experience. The Council unanimously adopted the recommendation. Visits were made to most of the places where experimental plants had been laid down. Subsequently a small, simple, inexpensive, double-contact, experimental bacteria bed was constructed by Mr. Mountain at Chorlton Ees. It worked with most satisfactory results. The scheme was submitted to Mr. James Mansergh for consideration and report. He and Mr. R. Strachan, M.Inst.C.E., then associated with Mr. Mansergh, gave the question most careful consideration during a period of about twelve months. Ultimately Mr. Mansergh made important recommendations concerning sewerage and flood-prevention works, and finally he recommended the adoption of a scheme of sedimentation tanks and bacteria beds for the treatment of the dry-weather flow of sewage, as well as storm-water filters to treat the first discharge of storm-water. Mr. Mountain in the scheme executed had adopted the principles laid down by Mr. Mansergh. He had now completed the sewage purification

works in a most substantial manner. The effluent discharged fulfilled the requirements of the Mersey and Irwell Joint Committee.

Mr. A. M. Fowler (Manchester) said the scheme of sewage disposal was thoroughly up to date, and for a purely domestic sewage the bacteria system gave very good results. In the case of manufacturing towns the treatment of manufacturers' refuse involved additional expense for screening, to prevent the fibrous and other material going into the beds and choking them up. For this reason he cautioned municipal authorities against forming too hasty conclusions as to the system of sewage disposal to adopt. He challenged the profession to say that the bacteria system would treat any class of sewage.

Mr. J. P. Barber (Islington) proposed a vote of thanks to the authors of the papers. He knew some of the difficulties which the Urban District Council had had to contend with, and he was certain that the way in which they had surmounted those difficulties was a credit to the profession to which they belonged and had raised them to a very high standard among municipal engineers.

Mr. S. S. Platt (Rochdale), who seconded, said he understood they had adopted contact beds because of the difficulty of the levels. Recently sprinkler beds had come into favour, and there was a tendency to abandon contact beds and go in for sprinklers. He had experience of both types of beds, and could say that the sprinkler beds had come to stay.

Dr. Fowler (Manchester) claimed that they could get equally good results from both contact and sprinkler beds. If they had a sufficient area of land he thought it was economical to go in for contact beds. On the other hand, if they were shut in a corner, he thought they would find it best to go in for continuous filters. In each case they must deal with the question as best fitted local conditions.

Mr. Corbett (Salford) was of opinion that a deep drain running through the entire district would be a benefit to the community. He asked if the difficulty in the way was an engineering one, or whether it was that of getting the various authorities to unite together.

The vote of thanks having been passed, Mr. Swarbrick said that thirty years ago all kinds of attempts were made to carry out the deep drain, but it was impossible, because they were not part of Greater Manchester and Salford. Probably, when they got the two united with all the suburbs, they might carry out many deep drainage schemes to the benefit of the district.

Mr. A. H. Mountain also briefly replied.

Cremation.

Mr. J. Harvey Simpson, Secretary of the Manchester Crematorium, read a paper on "Cremation in Manchester and Elsewhere." He said a more rational method of the disposal of human remains had been forced upon the community at large mainly for two reasons:—(1) The increase of towns and populous places; (2) The dangers to the public health to which places of interment give rise. Modern cremation was first brought before the British public in an article written by the late Sir Henry Thompson and published in the *Contemporary Review* of January, 1874. The publication of this article resulted in the formation of the Cremation Society of England in 1875. The two most prominent objections to cremation were the religious and the medico-legal difficulty. The following were the requirements under the Act for a cremation:—(1) The usual registrar's order for burial; (2) an application for cremation by the nearest relative or executor of the deceased, to be signed before a solicitor or justice of the peace; (3) two medical certificates, one to be signed by the ordinary medical attendant of the deceased. These forms were placed before the medical referee of the crematorium, whose duty it was to carefully examine the same, and, if satisfied, to give a written authority to cremate. The above requirements proved therefore that no cremation could take place except under satisfactory conditions. Having considered the two popular objections to cremation, they now turned to the arguments in favour of cremation. In regard to a dead body they had a duty to perform (a) to the deceased, (b) to themselves and to their descendants. In relation to the deceased, they must see that the dead body was dealt with kindly, decently, and in a spirit of reverence to his memory. In relation to themselves and to their descendants, they must see that in their

manner of dealing with the dead body they left no legacy of disease and pestilence from which they and their descendants might suffer from their disregard of proper sanitary precautions. The dangers to the public health to which places of interment gave rise were of two kinds:—(a) The contamination of air by the gaseous and volatile, and (b) of drinking water by the liquid and soluble products of decomposition. The following were the present crematoria in England and Scotland:—Birmingham, Darlington, Glasgow, Hull, Leicester, Liverpool, London (Woking), London (Golder's Green), London (Ilford), and Manchester. The crematoria at Hull and Leicester were erected from municipal funds by special Acts of Parliament; but now, under the powers contained in the Cremation Act, 1902, any municipality could vote funds for the erection and maintenance of crematoria. The crematorium at Ilford was erected for the City of London under such powers. The other crematoria were erected by private subscription, and would, it is anticipated, be eventually taken over by their respective municipal authorities. The main architecture of a crematorium was a detail entirely to the taste of the architect. The architecture of the Manchester crematorium was similar to churches to be found to-day in Lombardy and Venice. As regarded the furnace portion of the architecture, the form used at the Ilford crematorium, which was an improvement upon that of the Manchester crematorium, was the best one at present suggested.

On the proposition of Mr. A. D. Greatorex, (West Bromwich), seconded by Mr. Jones (Colwyn Bay), a vote of thanks was accorded to Mr. Harvey Simpson for his paper.

The members were then entertained to luncheon at the Public Hall, and the afternoon was devoted to visits to the crematorium, the refuse-destroyer, and the sewage-disposal works.

THE CONSTRUCTION OF PIANO-FORTES.

LAST week the President and members of the Society of Engineers paid a visit to the pianoforte factory of Messrs. Broadwood and Sons, at Stour-road, Old Ford, where they witnessed the manufacture of pianofortes of various types at every stage from start to finish. The first grand pianoforte was made by John Broadwood in 1770. In 1803 iron bars were first used by the Broadwoods in order to withstand the increased tension of the strings in their large grands. In 1821 they introduced the fixed string plate, and, six years later, James Broadwood patented a combination of resistance bars and string plate. In 1847 the firm brought out their first iron grand piano, an invention by which the instrument became practically independent of the wooden bracing below the sounding-board, and was thus enabled to sustain far thicker strings than formerly, the methods of pianoforte construction being thus entirely revolutionised. Chopin's piano, made for him by the firm in 1843, contained no fewer than five heavy parallel bars of iron. In 1850 the firm substituted a diagonal bar abutting on the string plate for the old straight resistance bars. Then followed the complete iron frame cast in one piece, and the steel barless grand piano, in which an elastic but very strong steel frame takes the place of the old-fashioned cast-iron frame. It will thus be seen that, even in its framework, a pianoforte involves a series of important technical considerations and mechanical details.

Messrs. Broadwood's new works cover a plot of ground 1½ acres in extent, within a boundary formed by Stour-road, Smeed-road, and Beachy-road, near Old Ford Station and Victoria Park, and they are connected by a private tramway with another plot on the Hackney Canal, which forms the timber yard of the firm. Every approved modern machine, tool, or appliance tending to rapidity and improvement in the product has been adopted. It is electrically lighted throughout by about a thousand incandescent lamps, and electric power transmission is largely used in the combination system adopted of driving the varied kinds of machinery partly by light high-speed shafting and partly in groups or singly by electric motors. Electric power lifts and an electric tramway are also employed.

The various processes carried out begin with the working of the rough materials at one end of the factory and end with the finished pianoforte in the store at the other. The rough sawmill is served by a line of tramway from the adjoining timber yard, and in it the timber is cut to various dimensions for the final artificial drying. This mill is

driven by two electric motors, one of 26 h.p. and the other of 20 h.p. As it leaves the machines the wood is stacked on special trucks, and these are placed on a traverser truck at one end of the adjoining air-drying house. From the traverser truck the special trucks with the wood are run into five drying chambers, where it remains for a few weeks to two months, according to requirement. An air propeller delivers about 17,000 cubic ft. of air per minute into the drying chambers. In the metal shop is a small vertical engine by Marshall and Co., which is used for continuously running the drying-room if required, and the exhaust from it is then used for heating the air for timber-drying. When the wood is completely seasoned the trucks are run into a second traverser truck at the other end of the drying chambers, and by it delivered to an electric lift, which raises it to one or other of two floors above the drying chambers for storage.

From these upper floors the wood, as required, is taken to the next building, in which is a large collection of modern wood-working machinery. Most of this is of British make, but there are some special American machines, while in other parts of the factory are some German and some French machines, besides other special machines made on the premises. The machinery in this shop includes numerous planing, thickening, and surfacing machines. There are also machines for planing four sides at one operation, tenoning machines, mortising machines, circular and hand saws, moulding machines for moulding from $\frac{1}{4}$ in. up to a cut 3 in. deep, with a width of 8 in., for shaping the falls of keyboard covers, large and small sand-papering machines, vertical spindle moulding machines, vertical spindle sand-papering machines, and other special machines. The whole of the chips, shavings, and sawdust from the machines in both this mill and the rough sawmill are carried off by a system of pneumatic conveyors to cyclones over a sawdust chamber in the boiler-house, where they are burned in the specially-arranged furnace of a Babcock and Wilcox boiler.

Parallel with the mill is a large metal-working shop, where the steel and iron frames of the grand and upright pianofortes are prepared. This shop contains a large number of special drilling machines, planing machines, radial and other drills, and tapping machines, lathes, and hinge-making machines. The shop is provided with overhead travelling carriers, which command all the drilling machines and the tramway, reducing the cost of lifting and carrying to a minimum. The products of the metal shop pass on to the japanning and gilding shops, and thence to a large four-story building in which are the case-making and finishing shops. Tram rails are laid throughout the ground floor.

Like the products of other shops, those of the wood-working departments also pass on a continuous process path to the various departments in the main building. Here, again, is a large quantity of machinery driven by electric motors, so distributed as to avoid the loss of time which occurs where ample appliances are not provided for a continuous process system. Three of these floors are provided with tramways and with overhead travellers and appliances for the economical handling of the work, and which lead to and from four 14-ton lifts, worked by 10-h.p. and 12-h.p. electric motors, and serving every floor.

In this building some 500 hands are employed, and a great quantity of sawdust and shavings is produced every day. To facilitate the removal of this, every floor is provided with communication to a large shoot, from which the waste is carried away by another system of pneumatic conveyors to the boiler-house. Some notion of the extent of this system may be gathered from the fact that the fans providing the air-exhaust and blast deliver over 1,000,000 cubic ft. of air per hour, and require about 36 h.p. to drive them.

A double system of heating is necessary, one portion for heating the workshops, and another for the glueing work, of which there is a very large quantity. At every point throughout the main buildings hot plates, heating chambers, and batteries of glue pots are necessary, and these are supplied with heat by the exhaust steam from an engine of 100 h.p. In winter this is supplemented by a hot-water heating system, comprising a battery of four large boilers, several miles of pipes, and a large number of American radiators.

At the north-eastern end of the works are the engine, boiler, and dynamo houses. The boiler-house contains four boilers, three being of the locomotive type, by Davey, Paxman, and Co., producing steam for about 320 h.p., whilst the fourth is a Babcock and Wilcox boiler, giving about 100 h.p. All the boilers work at a pressure of 120 lb. per sq. in. The feed-water is heated by a large Dohy-Chevalet detartriser, and there is a complete system of

feed pumps with duplicates connecting up with all the boilers, feed heater, separator, and elevated feed-water tank.

In the engine-house are four engines; one is a compound horizontal engine, by Davey, Paxman, and Co., of 100 i.h.p., for driving the large mill and the metal-working shop. Then there are two sets of combined Crompton-Paxman compound-wound dynamos, with Peache high-speed engines for nominally 40 kilowatts, but capable of large overload, each engine being of 80 i.h.p. Arranged for working in parallel with both or either of these 40 kilowatt sets is an 80 Kilowatt Crompton-Belliss compound-wound machine, capable of heavy overload, the engine being of 120 h.p.

These electric generators supply the whole of the incandescent lamp and the power circuits, the latter alone aggregating 160 h.p. effective, so that in the winter months the large set and one small set are always required. The switchboard is by Crompton and Co. Every work-bench has one lamp, and many of them have two, mostly of 32 candle-power. The cubic contents of the four floors of the main building is about 1,000,000 cubic ft., exclusive of the mills and metal shops, which are chiefly of one floor only, and make a total of about 1,250,000 cubic ft. of space in shops to be lighted, the floor area being over 100,000 sq. ft. This gives some idea of the task of arranging the lamps and circuits to the best advantage. By generating their own electricity, Messrs. Broadwood effect a great saving as against other methods of obtaining their lighting current, or lighting by gas; great convenience also results from having the electric power transmission facilities entirely under their own control. The pneumatic dust and shavings conveyor plant was supplied by the Sturtevant Company, under the specifications and superintendence of Mr. W. Worby Beaumont, and consulting engineer to Messrs. Broadwood, and under whom the whole of the engineering work has been carried out. The machinery throughout the factory has been erected by the Company's own staff, under their chief engineer, Mr. Collen. The electrical work has been carried out to the joint specification of Mr. Worby Beaumont and Mr. R. W. Weekes. The electric wiring and cable work was put in by Messrs. Ward Brothers. The buildings were erected by Messrs. Grover and Sons, Mr. Eugène Beaumont, being the architect.

A system of electric clocks, installed by the Synchronome Company, insures uniform time throughout the factory. There are twenty of these clocks, driven by electric impulses sent over the circuits from a master-clock. The four Day time recorders in the works entrance are also electrically driven from the same circuit. The works are provided with complete telephone communications between the various departments. The local exchange is placed in the general office and twenty-five telephones are connected to it. In the manager's office plug boards enable rapid connexion to be made to any department without the delay caused by going through switching operations at the exchange board.

COMPETITIONS.

BAPTIST CHURCH, BREARWOOD GREEN.—The designs submitted by Messrs. George Baines and R. Palmer Baines, 5, Clement's-inn, Strand, for this church have been selected. The building will accommodate about 400 persons in a mixed congregation, and the cost will be slightly over £1,500.

OPEN SPACE, WELSHPOOL.—The following is the result of the competition for laying out an open space in the town of Welshpool, *i.e.*, first premiated design, Mr. Frank H. Shaylor, architect, Welshpool; second, Mr. Leonard Moore, architect, Maidenhead; third, Mr. J. W. Rowell, architect, 21, Titchborne-street, Edgware-road, London, W.

STAMFORD FREE LIBRARY.—Mr. H. T. Hare, the assessor, has made his award in the competition for Stamford Free Library, and the successful competitors are as follows: First, "Portico A," Messrs. Hall and Phillips, of 6, Great James-street, Bedford-row, London, W.C.; second, "Burghley," Messrs. Buckland and Farmer, of 25A, Paradise-street, Birmingham; third, "Erming," Mr. Thomas William Colman, of Northgate-street, Ipswich.

NEW WESLEYAN CHURCH, HECKINGTON, LINCOLN.—The foundation-stones of a new Wesleyan church at Heckington, near Sleaford, were laid on the 22nd ult. The total cost of the building will be 2,250. The architect is Mr. A. E. Lambert, of Nottingham, and the erection of the building has been entrusted to Messrs. T. Barlow and Company, of the same town.

Books.

Storia degli Scavi di Roma. (Vol. II.) RODOLFO LANCIANI. Loescher and Rome, 1903.

Das Forum Romanum, seine Geschichte, seine Denkmäler. By CHRISTIAN HÜLS Loescher and Co., Rome, 1904.

To those who are at all familiar with literature of Roman topography the author of these two works need no introduction. They are without question the two greatest living authorities upon this most difficult and fascinating subject, and have already done incalculable service to students of it. They have watched and discussed the discoveries which of recent years have thrown more light upon the edifice of the ancient city than centuries of pollen on paper, and may be said to have made exceptional use of exceptional opportunities.

The two books, however, are of a somewhat different character. The *Storia degli Scavi di Roma*, of which this is the second volume (as its title implies) a history of the excavations which have been made within the city, and in its neighbourhood, from the 11th century onwards. The first volume, which appeared in 1902, extends as far as the year 1530 (though the period previous to 1400 occupies of the first forty-one pages), while the present volume does not profess to go beyond the year 1549. This statement is, however, to a certain extent misleading. In the first volume the chronological order was strictly adhered to; but in the second, in order to avoid the inconvenience of "perpetual change" from one subject to another and of the consequent dispersion all over the volume of information regarding any given building, the system has been modified, special buildings, groups of buildings occupying each a separate section. The history of these frequently does not stop abruptly at the year 1549, but is carried on to a considerably later date (e.g. the history of the Farnese collections is extended to the removal of its last remnants in 1834, and the excavations of the Baths of Trajan described down to 1897).

The present arrangement is certainly more convenient than that adopted in the first volume, but the statement in the preface, that "the second volume embraces a period of hardly eighteen years," requires some qualification. The book itself is a mine of valuable information, taken from unpublished documents, preserved in various archives, from the great store of notes and drawings of Rome remains made by archaeologists and architects of the Renaissance, which are to be found in the various libraries of Europe, and from the extensive printed literature of the subject. It is not, and is not intended to be, a book to be read through—differing thus in character from the handsomely illustrated volumes which have made Professor Lanciani's name well known to English readers. But as a work of reference it is of great importance, and many interesting items are added to our knowledge. That it is complete and exhaustive would not be claimed for it by the writer himself.

The history of the Capitoline collection from 1537 onwards is one of the best sections in the book. We find that the exportation of antiquities from Rome is no new thing, and that the municipal authorities, when (as often happened) the state of their finances did not permit them to enter into competition with private buyers, did their best to secure the retention in the city, though it was, as a rule, difficult to persuade the Pope of the day to take action. Nor did they view with indifference the destruction of the remains of ancient Rome in order to supply materials for the edifices of the modern city; and their protests, though often unheard, were frequent and emphatic. The praise which Professor Lanciani gives them (p. 96) is a well-merited tribute. Other sections trace in detail the history of other collections (notice especially that devoted to the Palazzo Farnese), though the greater part of the book deals with ancient buildings. The chapter which describes the destruction of the remains of the Forum Romanum is of interest (though its story has in part been told before in the writer's other works), and shows us how much better a state of preservation they were before the search for building materials for St. Peter's commenced in 1539. Indeed, if it had not been for those few years (for the process of destruction ended, temporarily at

ate in 1554) the whole of the Forum would come down to us in the condition in which atrium Vestæ and the fountain of Juturna recently been brought to light.

ll, from so much destruction some good ill, as Professor Lanciani points out (36), we owe to Paul III., the very Pope who lioned the devastation of the Forum, y of the changes by which Rome was trasns from a mediæval to a modern city in ource of the XVIII century. New build- were erected, new streets made, and old widened and improved. Sixtus V., later the century, no doubt did more, but he not the sole author of the new Rome.

Should be noted that some misprints (most men fairly obvious) might have been corded; and it may fairly be objected that to general reader it is of no service to be told number a print (with an unpublished ing the case is somewhat different) bears professor Lanciani's collection. It is also venient to have an article from a periodical y the pages and title of a reprint, without name of the periodical or the date being a (e.g., the reference to Geoffroy's *Album Pierre Jacques*—an article which appeared *Études de l'École Française*, 1890, p. 156 sq), o on the same page a reference to Vol. VIII. e Tarin MS. of Ligorio would have been ore used had the exact folio been cited.

he other book is of a very different nature. es not profess to be more than a hand-book visitors to the excavations of the Forum animum, the renewal and extension of which, r the charge of Comm. Boni, have excited uch interest in recent years; but it has erit of being written by an acknowledged er of the subject, and it has two advan- over Mrs. Barton-Brown's useful little ce, which was reviewed in the columns of *Builder* earlier in the year; first, that it is ided with an excellent historical intro- ; and, second, that it is not merely a iption of the work of the last six years, but des the whole of the buildings within the of the Forum, and the researches that been made there from the first. The new stigations thus are shown in their true ective, as coming at the close of a long e of previous "campaigns," and take their place within the picture of the whole; we are reminded that, though they are uly the most important that have yet undertaken, and though their director is y of the highest praise, yet—

Vixerunt fortes ante Agamemnona.

he illustrations, too, are well chosen, ranging views of the Forum taken in the XVth and th centuries to the latest photographs. plans, too, are good, though it is a pity neither on pl. II. nor pl. III. is the north d indicated.

he various problems connected with the m are only lightly touched upon; those desire to find a fuller discussion of them seek it in Dr. Hülsen's article in the *tische Mitteilungen* (1902, pp. 1—97). is not, therefore, the occasion to deal with subject in detail, nor to attempt to sustain claims of rival theories, which the author ationally does not mention in a professedly controversial volume, though a bibli- by at the end will be useful to those who to study the subject further. No better e for those who desire to acquire more e a merely superficial knowledge of the m, and who understand German, could ound.

Modern Carpenter, Joiner, and Cabinet-ker. Vol. VIII. London: Gresham Pub- ing Co. 1904.

most important section in the eighth me of this work is that on joinery, which it, we should have thought, to have pced the section on cabinet-making. It is once evident that the section is written an architect rather than a practical crafts- , for the first chapter plunges at once into geometrical methods of describing, enlarg- and diminishing the classical mouldings— ools probably of which the men who sub- ted and cut those mouldings were sub- ly ignorant. Since one section of this e is devoted entirely to architecture, we der that the chapter on mouldings did find a place in that section. Modern ry has been so hopelessly vulgarised by constant application of machine-run ed mouldings that the best policy, as our ger architects are beginning to realise,

is never to use a moulding in woodwork if it can possibly be avoided.

The bad arrangement of this work, and that absence of cross-references which we have already complained of, are further exemplified when, as frequently happens, the same operation is insufficiently described two or three times over in as many of the various sections. Take the instance of dovetailing. The three kinds of dovetails—common, lapped, and mitred—are described in less than half a page of text in the section on joinery, and at about the same length in that on cabinet-making; and in neither section is the student told, for instance, whether he should cut pins or dovetails first; or how, when either are cut, the others may best be set out so as to ensure a fit. A single good description of this important operation in one section, with a reference to it in the other, would have answered the practical purpose much better with the same economy of space.

Worse than this, as an example of the insufficient treatment of important operations and principles, we may take the following:—"Wide panels should be formed of narrow pieces glued together, with the grain reversed alternately" (page 314). What a reader unfamiliar with the process referred to would make of those last five mysterious words it is difficult to imagine. Yet in all these eight volumes upon the subject of wood-working these five words contain the only hint of that property of wood which it most concerns the joiner and cabinet-maker to know, and of which he is too frequently quite unconscious—the fact, namely, that a plank of wood in drying tends always to go round (convex) on that face which is nearest the heart of the tree, and hollow on the side remote, and that this tendency increases with the distance of the plank from the heart of the tree. It is for this reason that in jointing up a wide panel the heart-sides of its component parts should be kept alternately on the face and back-sides of the resultant panel. This principle is involved—it cannot be said to be hinted at—still more obscurely in a statement in the section on cabinet-making to the effect that a wide panel is more likely to stand if jointed up of narrow pieces than if cut from a single wide plank—a statement which is only true if the pieces are all cut nearly parallel to the medullary rays, or else jointed up in the way we have just described. In the section on timber, which goes into a great many less essential details, this important property is not so much as mentioned. These and similar deficiencies of these imposing volumes are the more culpable because on a casual inspection of the work, such as one might take at a bookseller's before purchasing, it would seem to be replete with every conceivable detail.

This volume contains also sections on shop management, estimating, and building law, and concludes with a good glossary.

The literary quality of the work all through leaves much to be desired. How comes it, for instance, that an author who seems to be a scholar rather than a practical craftsman should talk about "joining angles formed by the meeting of two boards," instead of joining the boards by which the angle is formed?

The Beginner's Guide to Carpentry. By HENRY JARVIS. (Marshall's Practical Manuals.) London: Percival Marshall and Co. 1904.

This may best be described as a book for the "very amateur," and it shows no great superiority to the numerous other cheap text-books on the same subject which are already on the market. The author makes a praiseworthy effort to do the first steps thoroughly; he shows how the most necessary tools may be bought or made, used, sharpened, and kept in good working order, and describes the construction of bench, sawing-trestles, mitre-box, wooden cramps, etc. There is a chapter on timber, in which, however, its curious and important physical properties are not described, and another on glue. With all this the student does not learn how to joint two pieces of wood together edgewise until the fourteenth out of fifteen chapters, and then he is given none of the most essential practical hints—he is not told, for instance, how to use his plane so as to correct an edge which is not perfectly square, and unless he is told this he will certainly try to do it in the wrong way.

At the end of this chapter nothing has been said about the elementary operation of plain

dovetailing, and very little of others equally important; yet the next and last chapter opens with the following sentence:—"In order to give a finished appearance to work it is often necessary to add an ornamentation of some kind, and we propose, by way of conclusion, to describe a few easy methods of doing this." How characteristic is it of modern ideals in wood-working and other arts that easy methods of ornamentation should be asked for and described, when some of the first principles of construction have not been—nor will be—so much as touched upon! It is true that occasional references are made to the *Wood-worker* journal, and to another text-book on "Woodwork Joints," not apparently of the same series; but if a "Beginner's Guide to Carpentry" cannot cover the most elementary operations involved, why should it be concerned with "easy methods of ornamentation"?

Ferric and Heliographic Processes: a Handbook for Photographers, Draftsmen, and Sun Printers. By GEORGE E. BROWN, F.I.C. Second edition. London: Dawbarn and Ward.

In the first eight chapters of this little work the reader will find a considerable amount of information relative to the theory of various processes for the production of prints from tracings and drawings, and numerous formulae for the preparation of sensitising, developing, toning, and other solutions. These chapters are of comparatively little interest to architects and engineers, who usually purchase sensitised papers ready-made, and unfortunately the author does not state in every case whether the prints produced by the several processes are of the "positive" or the "negative" variety. A further undesirable feature is the insertion of plates which are more appropriate as advertisements for certain manufacturers than as illustrations of the letterpress. In fact, one of them has no apparent connexion with the process described, another is entirely misplaced, and none of them are numbered or mentioned in the text. Chapter IX. contains a useful summary and comparison of heliographic processes, by which negative and positive prints may be made in the drawing office; and Chapters XI. and XII. dealing with the preparation of tracings for sun-copying and the necessary outfit for printing purposes, are distinctly worthy of perusal. In the three succeeding chapters will be found detailed instructions for printing by the four processes in general use—the ferro-prussiate, giving white lines on blue ground; the pellet, blue lines on white ground; the ferro-gallic, black lines on white ground; and the brown, white lines on brown ground. In the second of these chapters there is another plate baving no reference whatever to the text, but careful study of Chapter XIII., on "Minor Heliographic Processes," will lead to the discovery of five lines mentioning a "secret process" by which the misplaced plate was evidently printed. As the method in question is not available to the public, it is difficult to understand why the author should take the trouble to give an example of its work, but if he really thought the illustration of importance he might just as well have put it in the proper position. With the exception of some hints on oiling drawings on paper for printing, the removal of stains, and the mounting and varnishing of prints, the remainder of the book is devoted to matters of more interest to those who require guidance in the preparation of papers than to the architect or engineer. Although the arrangement of the matter leaves much to be desired, the author of this work evidently understands his subject, and has given in compact form a useful collection of notes, which may be studied with profit by all desiring information as to the theory and practice of the processes described.

British Standard Sections issued by the Engineering Standards Committee; Properties of British Standard Sections. LESLIE S. ROBERTSON, M.Inst.C.E., Secretary. London: Crosby Lockwood and Son. 1904.

THIS, the latest publication of the Engineering Standards Committee, contains particulars of the standard sections for angles, tees, channels, beams, and Z-bars, the dimensions and other measurements having been published some months ago in the form of a pamphlet which was reviewed in our columns at the time. That pamphlet gave the size, thickness, weight per

foot, and sectional area of each section settled, and the same information is repeated in the present book, but with the addition of the centre of gravity, moments of inertia, radii of gyration, and moments of resistance for each section. The latter measurements are obviously of the greatest value to architects and engineers who require to calculate the proportions of the members used in structural work, and their preparation must have involved a vast amount of labour and much expense. Doubtless everyone into whose hands the book may come would be quite willing to accept the names of the eminent experts constituting the three committees by which the lists were drawn up as sufficient authority for the accuracy of all the figures. It is not necessary, however, that these should be accepted blindfold, for in the preface are given details of the methods adopted for arriving at the mathematical measurements to which we refer. This preface, written by Mr. Max am Ende, is extremely concise and contains all requisite explanations, together with the formulae used by the staff of the Committee for the purpose of calculation. The present volume has long been awaited by architects and constructional engineers, by whom we feel sure it will be heartily welcomed.

Journal of the Sanitary Institute; Vol. XXV., Parts I. and II. London: The Sanitary Institute and Edward Stanford. 1904.

PART I. contains *inter alia* two or three papers of especial interest to architects. That on "The Ventilation of Buildings," by Mr. E. T. Hall, F.R.I.B.A., is a sane and useful contribution, and the discussion on the paper is also worth reading. The discussion on "Municipal Rehousing," opened by Mr. W. E. Riley, F.R.I.B.A., gains in value by the plans with which the report is illustrated. The paper on "Disinfecting Stations," by Dr. H. R. Kenwood and Dr. P. J. Wilkinson, is full of useful information and includes plans and views of buildings and illustrations of disinfecting and washing apparatus; for disinfecting textile articles the authors are in favour of saturated (not superheated) steam at a pressure of about 10 lb.

Part II. is of more general interest, and is almost exclusively confined to the Sectional Addresses delivered at the Congress in Glasgow in July. By far the longest paper is that by Prof. J. Glaister on "Smallpox Infection from Hospitals"; after a long review of the evidence, he comes to the conclusion that the doctrine of aerial convection has not been proved. The address delivered by Prof. Frank Clowes deals principally with the purification of sewage, special reference being made to his work for the London County Council. Sir Richard Douglas Powell in his address on "The Prevention of Consumption" lays stress on the necessity for "general hygiene" in combating the disease, and thinks that "our measures for sanatorium treatment are on right lines." "School hygiene" forms the subject of a paper by Dr. E. Walford and of an address by Prof. John Elgar.

The Purification of Sewage. By SIDNEY BARWISE, M.D., B.Sc., etc. Second Edition, revised and enlarged. London: Crosby Lockwood and Son. 1904.

THE first edition of this work was published in 1898, and was followed in 1901 by a smaller book entitled "The Bacterial Purification of Sewage," which was intended as a supplement to the former. Although the fact is not stated in the preface, the new edition contains much of the matter which appeared in the supplementary volume, and is really therefore a revised and enlarged edition of the two earlier works. Dr. Barwise, like so many recent writers on the subject, states that percolating filters give better results than contact-beds, and adds that they are also in many cases less costly. One of the principal objections to the system has been the difficulty of distributing the sewage uniformly over the surface of the bed, and Dr. Barwise devotes nearly the whole of Chapter X. to descriptions and illustrations of various kinds of apparatus designed for this purpose. The analysis of sewage and sewage-effluents is described in detail in an appendix of twenty-five pages. The book can be recommended as an excellent handbook on a difficult subject, and will prove useful to the engineer as well as to the medical officer and the councillor.

Illustrations.

COMPETITION DESIGN FOR LIVERPOOL CATHEDRAL: INTERIOR VIEW.



THIS is an interior perspective view, made (if we mistake not) since the competition, showing the interior effect of the design submitted by Mr. W. J. Tapper.

In our review of the second competition (*Builder*, May 30, 1903), we drew attention to the many fine and effective characteristics of this design, which we regarded as the finest of the five, and the one which we should have wished to see carried out. We may draw attention to one more point which is brought out in this interior view, viz.: the effect of space given to the immense nave by the contraction and the comparatively narrow proportions of the choir. This was an intentional and considered contrast, without which the scale of the nave would hardly have been realised.

The plan was published in our issue of June 13, 1903.

FOREIGN FLOWER MARKET, COVENT GARDEN.

This building has been erected by the Duke of Bedford, in place of a structure of a more temporary character, to meet the demands of the increasing foreign flower trade.

The site upon which the building stands was cleared some years ago to reduce the congestion of streets in the neighbourhood by accommodating waggons and other vehicles laden with market produce. The retention of as much of this wheel area as possible necessitated wide spans and few points of support, and resulted in a departure from the regular planing of market buildings in the construction of the market upstairs.

The first floor is approached from the east end by two exceptionally wide staircases, each entered by two doorways in the north-east and south-east angle pavilions, and by an additional staircase situate at the north-west corner; it provides sixteen small offices for the use of salesmen against the north and south walls, each with its own stands and counter for the display of flowers. In the centre of the hall thirty-four more stands and counters are provided, with ample space for the public between the rows of counters. Additional offices on the first and second floors, over the north-east and south-east staircase entrances,

are provided for salesmen and for the flower market staff.

To facilitate the delivery of goods two electric lifts, running from the basement to first floor, are provided at the south-west with motor-room over. The basement, which is lofty, is mainly used for storage purposes, and is approached by three staircases. Loading flaps are also provided through the wheel floor at convenient intervals, with mezzanine staging under extending over a considerable portion of each cellar.

The materials used in the exterior are sand-faced bricks and Portland stone, with light buff-coloured Candy's facings have been used for the staircases and internal walls of market on the first floor. The building has been designed so as fairly to be in harmony with the other more recent market buildings and to express externally the arrangement of plan and the purpose for which the building is intended.

In view of the necessity for the pier and other supports being as few as possible, special attention was given in the designing of angle pavilions to avoid the appearance of building standing on stilts. The probability of future extension westward has also borne in mind.

The glazing of the roof lights is on Mello principle; the lifts are by Messrs. East Messrs. Merryweather supplied the fire hydrant artificial lighting, which is of special importance (the bulk of the business being done in the early morning hours), is effected by high pressure incandescent gas, installed by Messrs. Keith, Blackman, and Co.; Mr. Henry McCaskey was the carver, and the builders were Messrs. Cubitt and Messrs. Howard and Co.

The architects are Messrs. Lander, Bedford and Crompton.

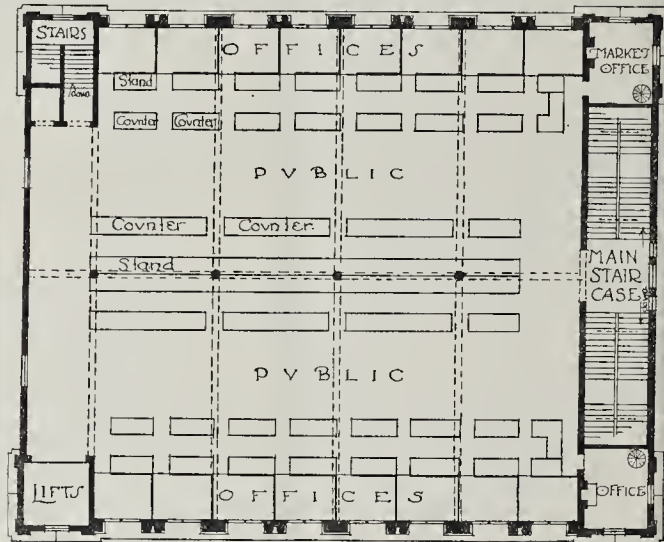
HOUSE NEAR LEICESTER.

This dwelling-house has been recently erected in the parish of Oadby, near Leicester, by Mr. M. H. Pearson.

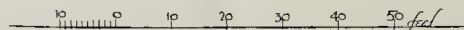
The materials used are Woodville's bricks for the wall facing; Ketton stone, sills, copings, and other dressings; old Swalesland slates for roofing; these are thick, varied in colour, and laid in diminishing courses.

The ridges and hips are covered with lead, the eaves, gutter, and downspouts in the same material, but with some slight modelled enrichments.

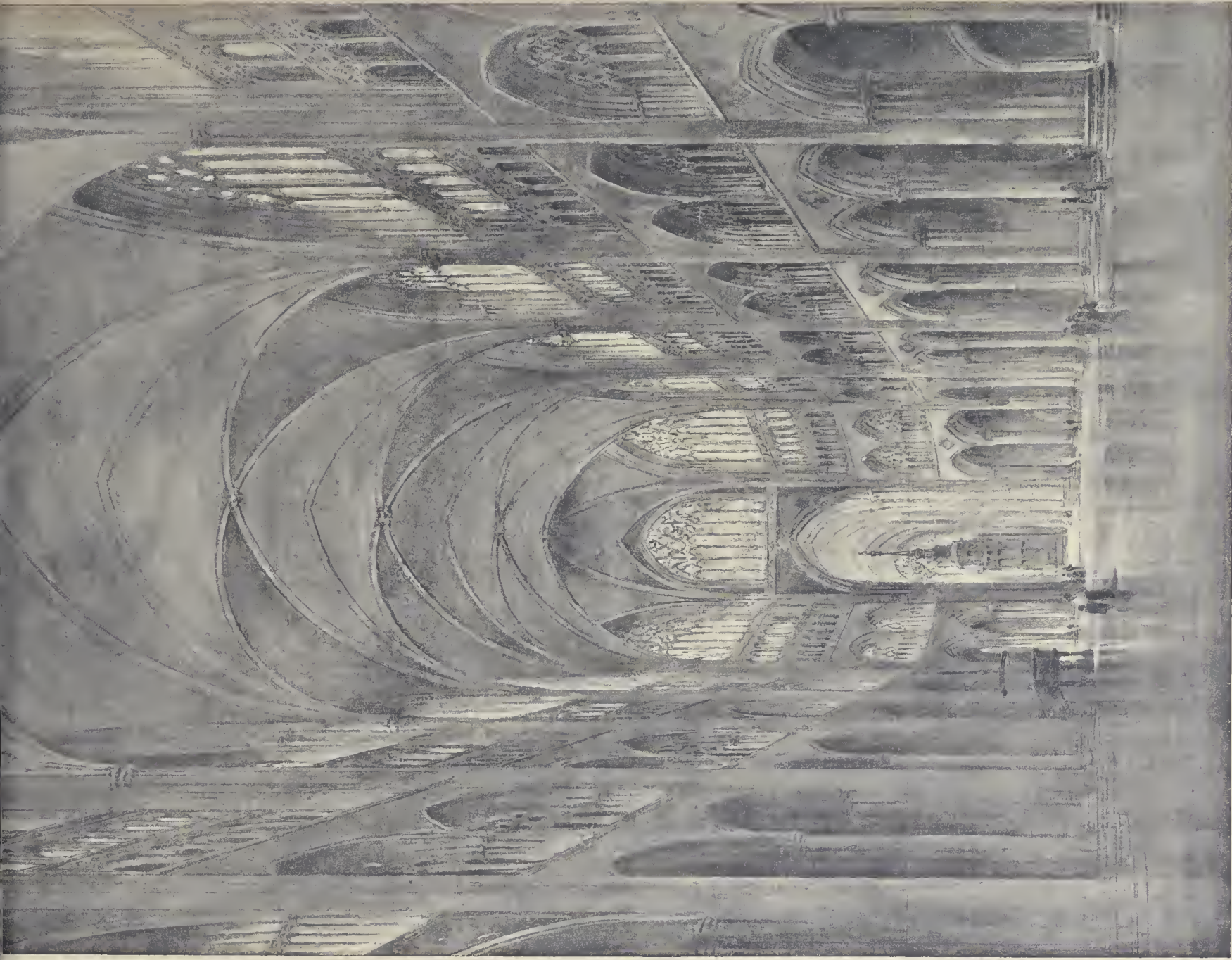
The garden adjoining the house has 1



FIRST FLOOR PLAN



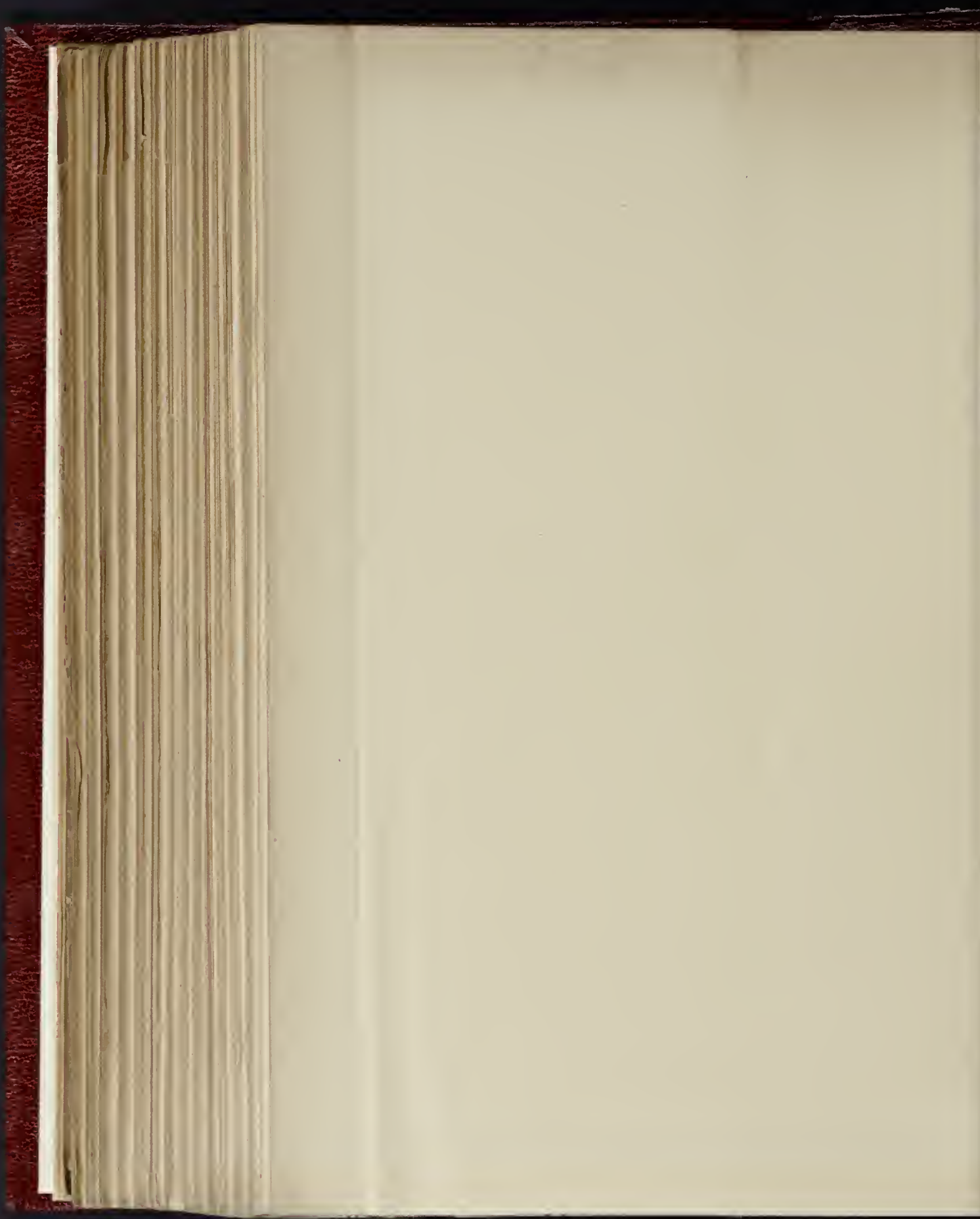
Foreign Flower Market, Covent Garden.



INT. PHOTO SIMONNE AC. 174 4.5 640 HARDING STREET PETER LANE E.C.

COMPETITION DESIGN FOR LIVERPOOL CATHEDRAL.—By MR WALTER J. TAPPER, A.R.I.B.A.

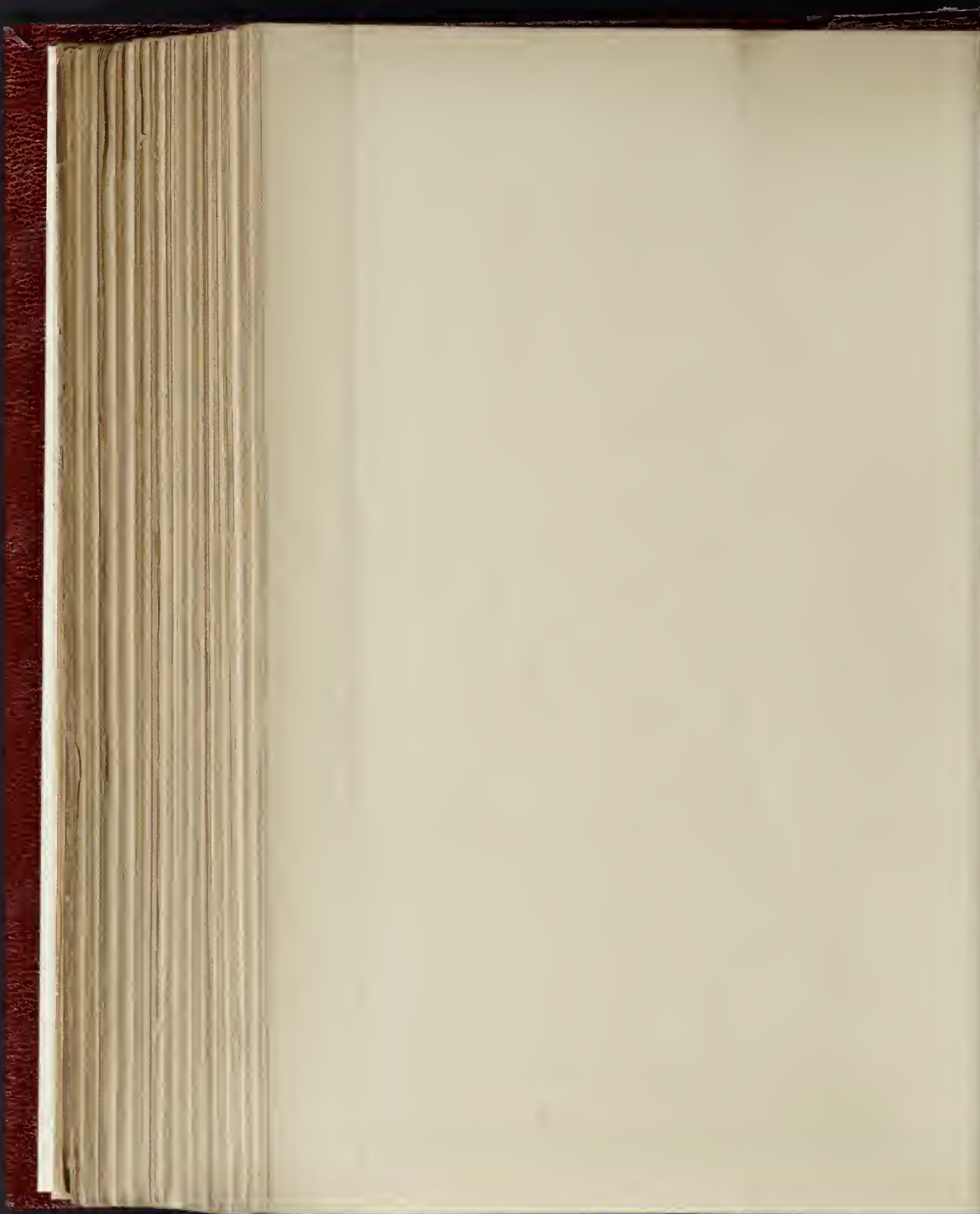
INTERIOR VIEW.

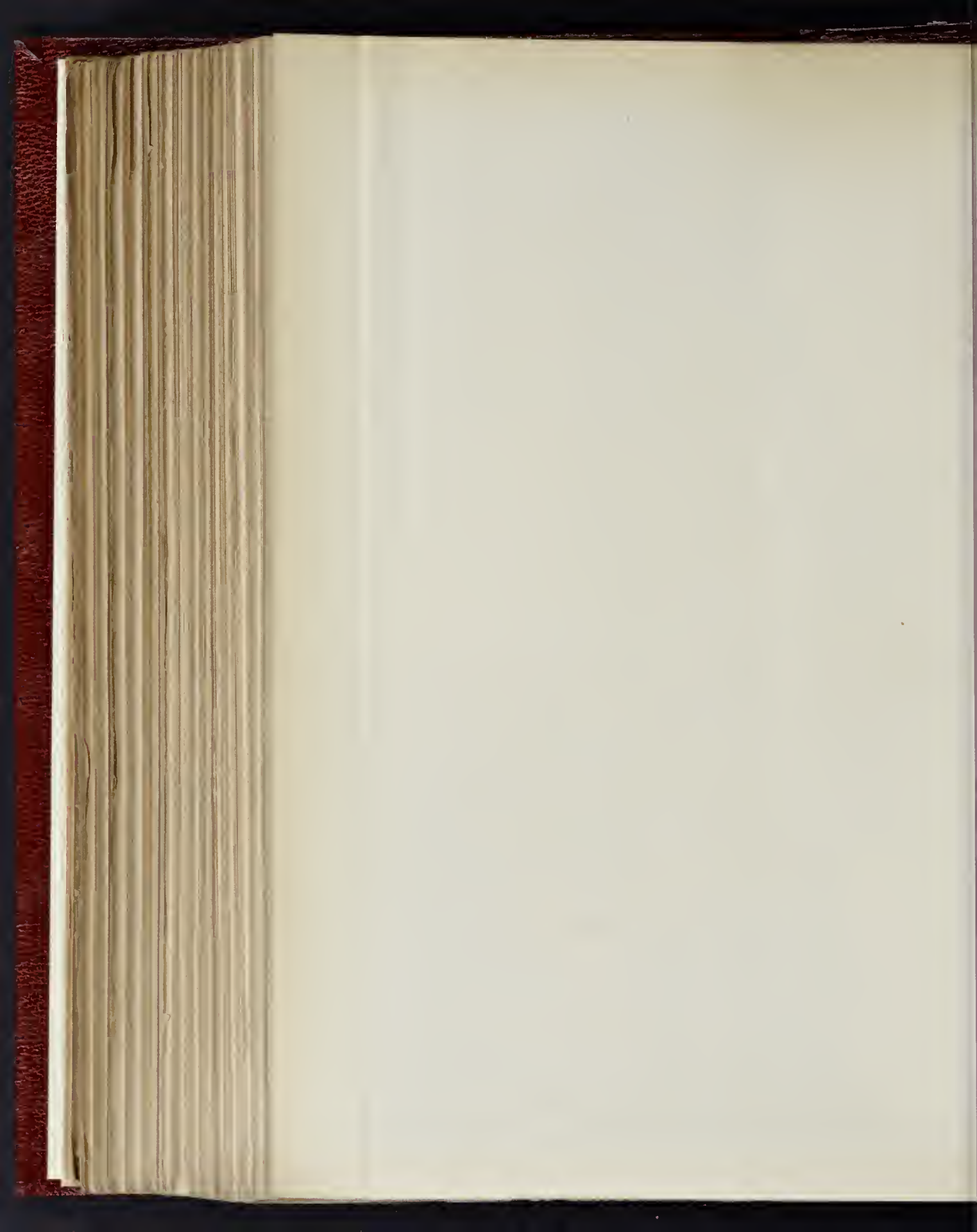




INK PHOTO SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

NEW FOREIGN FLOWER MARKET, COVENT GARDEN - MESSRS LANDER, BRIDGELL & CROMPTON, ARCHITECTS



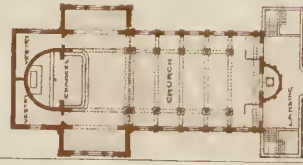




MR. PHOTOGRAPHIC & C. 4 & 5 EAST HINDING STREET, PETER LANE, E.C.

ST. HILDEBURG'S CHURCH, STANLEY ROAD, HOYLAKE MR. EDMUND KIRBY, F.R.I.B.A., ARCHITECT

THE BUILDER, OCTOBER 1, 1904

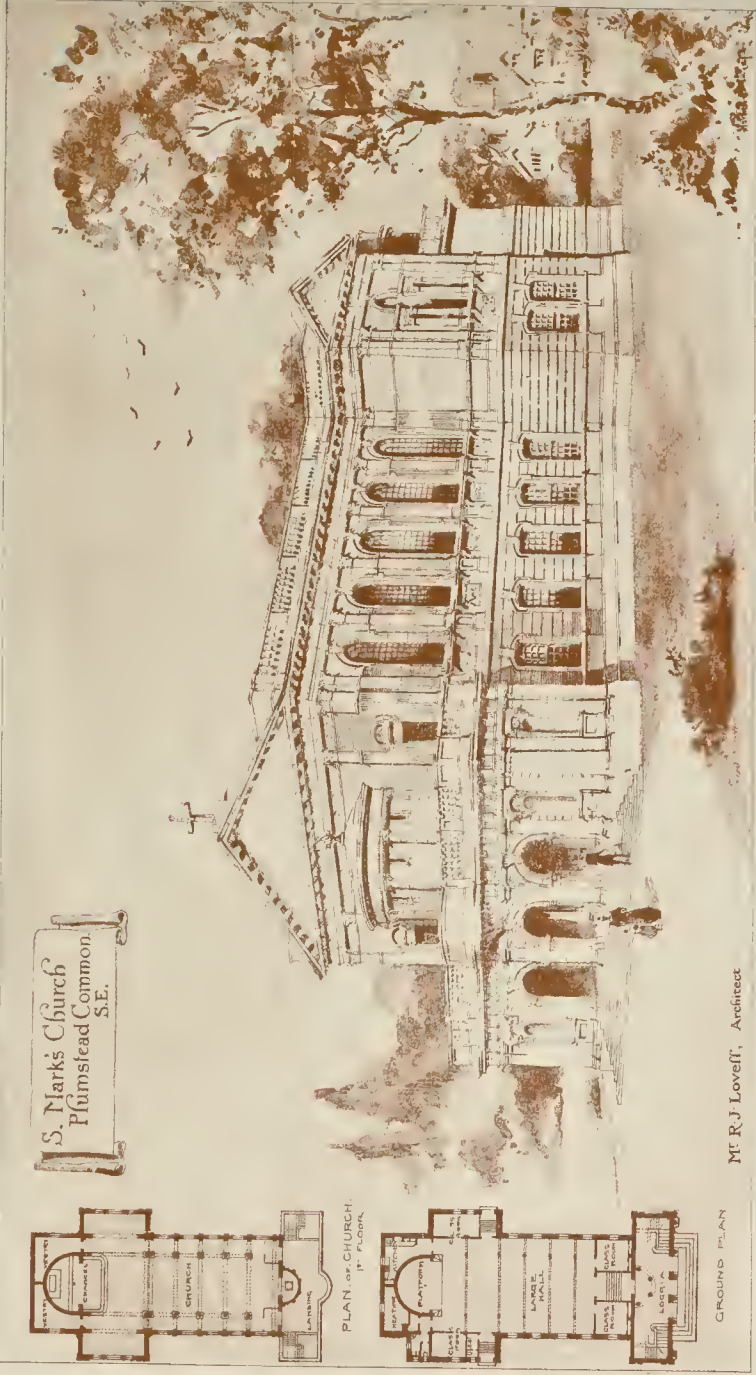


PLAN OF CHURCH IN 1904



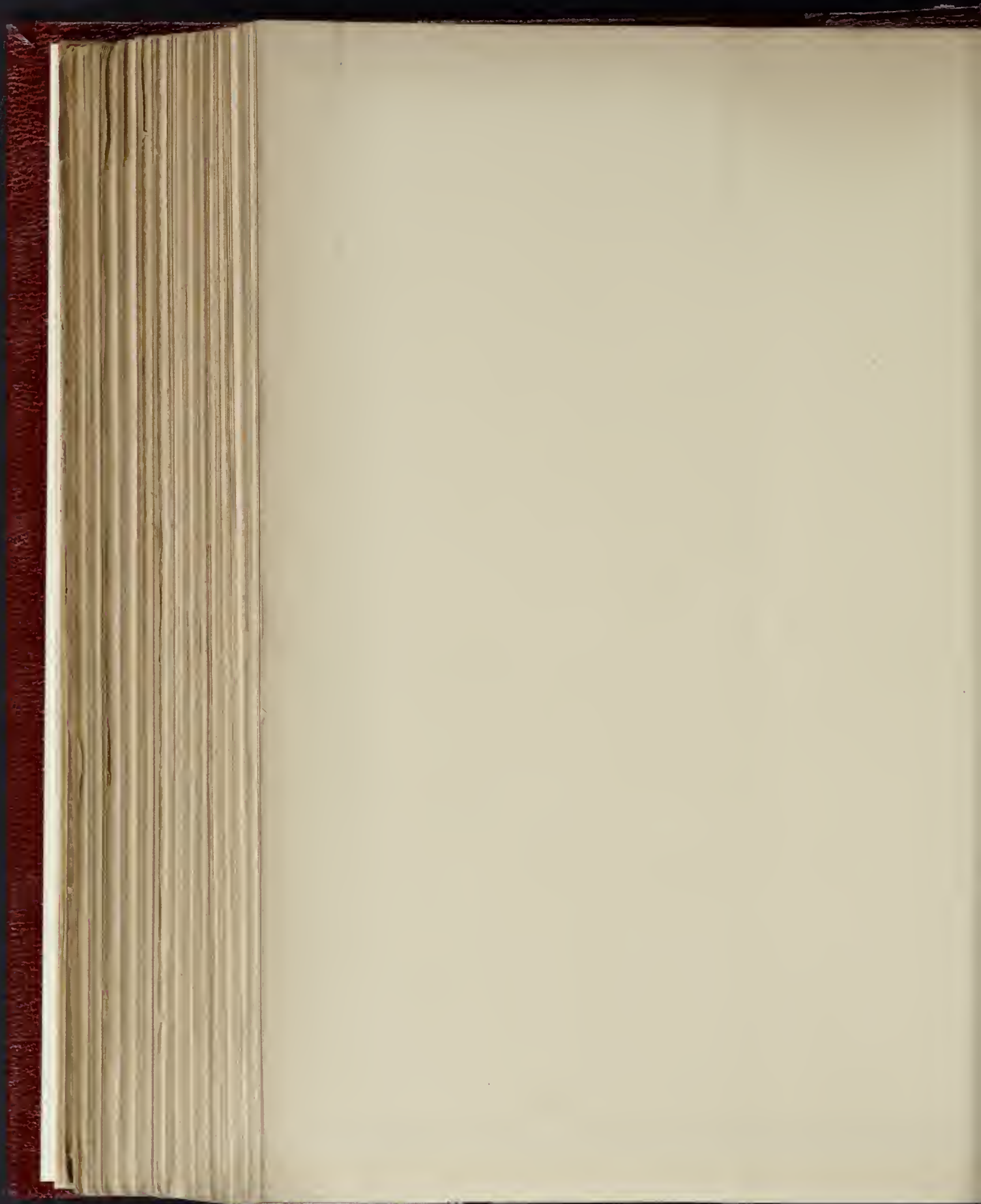
GROUND PLAN

S. Mark's Church
Pfumstead Common,
S.E.



MR. R. J. LOVELL, ARCHITECT

MR. PHOTOGRAPHIC & C. 4 & 5 EAST HINDING STREET, PETER LANE, E.C.



ent in a formal manner from the architects' contractors for the work were Messrs. W. Chambers; and the architects Messrs. Ward and Pick, all of Leicester.

HOUSE AT ROGOJENY, RUSSIA.

This drawing was exhibited at the last Academy, under the title "Design for a house in South Russia." Referring to the absence from England of the architect, Mr. H. Inigo Triggs, we are unable to furnish any further information in regard to it.

HILDEBURG'S CHURCH, HOYLAKE.

This church has been erected on the north-boundaries of the celebrated golf links. The site was given by the late Lord Stanley of Ely, who also was a contributor in many ways to the building. Through the donations of some members of the congregation and friends of the church the interior has been much embellished; for instance, the chancel has been paved with tiles of different patterns by Messrs. Partner and Brindley. It has been furnished with oak stalls, and placed by the chancel arch with an oak pulpit with a canopied sounding-board, all carved elaborately. The oak work executed by Mr. Hunstone, of Tideswell. The largest Lord Stanley's gifts may be seen in the filling of a great number of windows with stained glass made by Messrs. J. and Sons, of Whitefriars. Mr. Wm. Ward, of Wigan, was the builder, and Edmund Kirby, of Liverpool, the architect.

MARK'S CHURCH, PLUMSTEAD.

MARK'S, Plumstead, was designed for the Rev. A. V. Baillie, now Rector of Rugby, but by the Vicar of Plumstead. It occupies a high and prominent position overlooking the Tidal Common. The main feature of the design is that the church is planned to be on the first floor, and reached by wide outside flights of stone leading to a large open landing. A feature of this landing is that it contains a projecting pulpit, to be used for open-air preaching. At the present, however, only the lower part, which is finished in brick, has been built, the roof of which is formed of Homan and Rodgers' fire-construction and asphalted. This will be the floor of the church when built. The architect is Mr. Richard J. Lovell; the contractors being Messrs. L. H. and R. Roberts. The plan, as will be seen, constitutes in its features a revival of the ancient Basilica and represents a somewhat unusual precedent in modern English church architecture.

TRADE CATALOGUES.

Messrs. HERBERT MORRIS and BASTERT, of Birmingham, send us their catalogue No. 41, the object of which is to recommend their "M. B." pulley block. This appliance is provided with double-pitched worm gear, and worm and wheel being machine-cut, and so timed that the form of gear, the workmanship and accuracy of fitting, are such that the one would suffice to reverse the motion. The pulley block can be fitted with a self-automatic brake, allowing free rotation, and creating sufficient resistance in order to balance the load. Those who have ordinary self-sustaining pulley blocks that, apart from other disadvantages, are liable to the power exerted is considerably in excess of that usefully employed in raising the load. It is certainly wise to avoid blocks of this kind, and the catalogue here recommended is quite worthy of study by builders and contractors generally. Acetylene Corporation of Great Britain send us a copy of the fifth edition of its catalogue of acetylene generating plant and accessories. Although acetylene is not so common in London and other large British towns as it was four or five years ago, it is still from the work which has been, and is being accomplished by this and a few other firms at the acetylene industry has at length established upon a sound and substantial basis the successful adaptation of acetylene luminant for country houses. Installed and operated by this corporation several years

ago in various country churches, schools, and mansions are certified by their owners to be still giving satisfaction. The present catalogue contains many illustrations of lanterns, pendants, and brackets specially designed for use with acetylene, and also contains much useful information concerning acetylene and calcium carbide. The assumption that calcium carbide "contains 5 cubic ft. of gas in every pound thereof" is, however, entirely erroneous. Calcium carbide does not contain any acetylene.

Messrs. J. and H. McLaren, of Leeds, send us a pamphlet, written by Mr. John McLaren, M.Inst.C.E., descriptive of the traction engines made by them, and of the various uses to which these machines have been applied in various parts of the world. After an introduction, occupied chiefly with the works equipment of the firm, the author directs attention to the salient features of "thrashing" engines, and next deals with the heavier types of road locomotives employed for haulage purposes. Illustrations are given of military traction engines and cranes of the types largely used during the South African campaign, in which they were proved to be of the greatest value. Perhaps the most interesting series of illustrations is to be found in the last chapter of this pamphlet, descriptive of "Pioneer Work in the Colonies." The photographs here reproduced give an excellent idea of the immense assistance afforded by mechanical haulage, and of the trying situations in which traction engines often find themselves in new countries. Mr. McLaren has not attempted to follow the bad example of those who profess to write scientific treatises while their real object is to force advertisements on unsuspecting readers, but gives a straightforward account of the general serviceability of the types of locomotive, with the development of which he has been honourably associated for many years past.

BOOKS RECEIVED.

NOTES ON BUILDING CONSTRUCTION. Parts I. and II. New edition; revised and enlarged. (Longmans, Green, and Co. 10s. 6d. each volume.)
ORNAMENT AND ITS APPLICATION. By Lewis F. Day. (B. T. Batsford, 8s. 6d.)
STYLE IN FURNITURE. By R. Davis Bean. (Longmans, Green, and Co. 21s.)
OLD COTTAGES AND PARISH HOUSES. Illustrated by James P. Perkins. Introductory and descriptive notes by E. A. Ould, F.R.I.B.A. (B. T. Batsford, 21s.)
SMALL DESTROYERS FOR INSTITUTIONAL AND TRADE WASTE. By W. Francis Goodrich. (Archibald Constable and Co. 4s.)

The Student's Column.

NOTES ON PORTLAND CEMENT. CHAPTER IX. (Continued).

THE exposure to weather and the effect of temperature on concrete does not appear to be taken into account by users generally. Very often a cement is condemned because the concrete will not set quickly enough. In cold, wet weather concrete cannot be expected to set as quickly as in hot, dry weather.

Mr. A. E. Carey, an engineer of wide experience in concrete work, in a paper on "Concrete in Relation to Marine Work," read before the Engineering Conference of the Institution of Civil Engineers, says:—

"The effect of a low sea temperature is a subject which has not hitherto received the notice its importance merits. The author had seven winters' experience at Newhaven, that of 1889-81 being unusually severe; but, in carrying on the harbour work now in progress at Hastings (only about twenty-five miles distant), the experience of last winter raised novel issues in this particular. The breakwaters at Hastings are being wholly constructed in mass concrete, and, commencing in October last, the setting became so extremely slow that work on the foundation reef was liable to be ploughed up by a sea sometimes days after deposit. The specification is a severe one, and the greatest care was taken in testing.

"Up to this time nothing of the kind had occurred, and the season was open and normal. Cubes of concrete were then made with, and immersed in, sea-water in the open, the cement being taken from five of the best makers. All gave pretty much the same results, the

cement failing to set for days. The retardation of the setting was ultimately clearly traced to the extremely low temperature of the sea, due, doubtless, to the predominance of cold currents flowing down from the North Sea. The sea temperature varied in January last from 37° to 38° Fahr.; February, 37.5° to 40°; March, 31.5° to 43°; and in April, 43° to 49°. At Newhaven probably the warmer currents from the Atlantic set up a different set of winter conditions. Observations of the sea temperatures, as long continued as possible, and some elasticity in the specification are two important matters where extreme seasonal variations may obtain. A very heavily-burned cement is unsuited to winter work under rigorous conditions of temperature."

With certain necessary precautions, cement work can be done in freezing, as well as hot, dry weather. In freezing weather the work should be protected by covering with thick paper, tarpaulin, sawdust, or sand. Some contractors use salt in the gauging water. There are, however, objections to its use, and it can be dispensed with. In the publication of the German Association of Cement Manufacturers on "Portland Cement and its Applications" we find the following:—"In cement work to be executed in freezing weather the addition of salt to the mortar has been recommended and used; such an addition, however, is not only superfluous, but even injurious, as it causes unsightly efflorescence on the work. If compelled to do cement work in very cold weather, it is preferable to heat the water and sand, and use little water in order to accelerate the setting of the mortar. If one is careful not to allow any free water to separate out, or to absorb this water with dry stone, there is scarcely anything to be feared from the action of heavy frost, and the use of salt may be dispensed with."

Paving or plastering work which has been frozen appears spotted, blistered, scales off, and sometimes crumbles.

Similar work exposed to very hot weather resembles glazed clay, and shows small cracks like those in dried mud. In hot weather the great secret is to keep the moisture in the work, and it should be kept wet for some days after setting, as it helps in the hardening and bleaches the surface, thus obtaining a better colour.

One authority on concrete work says:—"It should not be overlooked that in the laying of dry concrete it is absolutely necessary in warm weather that the surface be kept constantly wet with water, and for the best results it should also be covered, the best method of accomplishing this being probably the use of large pieces of canvas."

Badly-mixed concrete gives poor work. In work which has to be faced it is the cause of irregular finish, sandy surfaces, and, in paving, it wears badly and unevenly. Concrete should be mixed so thoroughly that all the materials are covered with a thin coating of cement. Sand, gravel, or stone should be slightly damp, so that the cement will adhere to the particles when mixed in the dry state. The cement and aggregate should be thoroughly dry-mixed before adding water.

Work on poor foundations causes the concrete to crack. Where the ground does not drain naturally, about 6 in. to 12 in. of broken stone should be put in before the concrete and well tamped.

Insufficient tamping makes work porous and weak. In work which is faced, the top coat should be laid before the lower one has set, or top and bottom courses will not unite. The hollow sound in paving is often from this cause. Some contractors say that by damping the bottom course and sprinkling with neat cement in sufficient quantity to unite the two courses and tamping will give good results. If the concrete contains dirt or clay, this will rise to the top and prevent surface coat adhering.

In finished work, over-trowelling brings too much cement to the surface. When this top skin wears off, the under work will be powdery and rough. Over-trowelling also causes hair cracks.

Insufficient trowelling will cause rough, pimply surfaces, the latter due to the air not being worked out.

It should be remembered that trowelling is only done to obtain a smooth surface.

In paving and such like work some operators dust neat cement over the surface. This practice cannot be recommended; it causes hair cracks, and has the same effect as over-trowelling.

If necessary, never dust with neat cement, but with a mixture of cement and fine sand.

Hair cracks in finished work are caused by the following:—Too much water used in gauging, over-trowelling, allowing the top to dry out quickly, too much cement brought to the surface, and dusting with neat cement.

Large cracks are caused by poor mixing of concrete, bad foundations, and expansion of foundations through wet.

Crumbling may be caused by not using enough cement, poor mixing, dirty materials, and cement drying out before being set.

In years to come this will undoubtedly be called the "concrete age." Rapid advancement is being made in the application of cement concrete to the various forms of construction. Concrete is admirably suited to building. It is fireproof, is not affected by dampness, and becomes harder with age.

The building block industry has made very rapid progress in the last two years, and many residences have been erected in concrete blocks in almost every city. Especially in America is this form of construction coming into very extensive use.

COURT OF COMMON COUNCIL.

The first Court after the vacation was held at the Cullihall on Thursday last week.

A communication from the chapter clerk of St. Paul's Cathedral, suggesting that some permanent representative of the City should be appointed as trustee of the Fabric Fund of the Cathedral, in the place of the Lord Mayor, was referred to the General Purposes Committee for consideration and report.

Street Improvements.—The Improvements and Finance Committee submitted a lengthy report relative to a number of proposed street improvements in the City. The following improvements were sanctioned:—Removal of the buildings over the entrances at either end of Duke Head-passage, cost 500*l.*; widening of the public way in front of 71, Fleet-street, contribution 2,214*l.*; widening of Old Broad-street in front of Winchester House, at the corner of that thoroughfare and Loudon-wall, 3,000*l.* for acquiring the necessary land.

Public Service Works.—A communication was received from the Board of Trade approving and allowing the by-laws made by the Court under the provisions of the City of London (Various Powers) Act, 1900, with respect to public service works authorised to be constructed in the City.

The Unemployed.—A letter from the Metropolitan Borough of Islington asking the Court to appoint three representatives to attend the conference to discuss the question of the unemployed, which conference will be held in the Town Hall, Islington, on October 10, was referred to the Streets Committee for consideration.

OBITUARY.

MR. LAWSON.—We regret to announce the death of Mr. George Anderson Lawson, R.S.A., the eminent sculptor. Of Mr. Lawson's principal works the following have been illustrated in the *Builder*:—"Ave Caesar, Imperator, Moriuri Te Salutant," the figure of a *retirius* (June 21, 1884); "Summer," a lad resting after bathing (May 29, 1886); "Spartan Dancing Girl Reposing" (May 30, 1888); "Cassandra," a statuette (June 9, 1888); "Motherless," a father and child; and "Bequeathed by Bleeding Sire to Son," a youth bearing his father's shield (May 13, 1889). These were exhibited in the Royal Academy rooms in the years we cite. We have also illustrated Mr. Lawson's statue of Burns, at Ayr (September 10, 1892), a replica of which he was commissioned about twenty months ago to execute for the Caledonian Society of Melbourne; "Death of Cleopatra" (October 23, 1886), shown in the Royal Academy, and subsequently at the Edinburgh Exhibition; and the sculptured friezes, forming one continuous band, for the municipal buildings and technical schools at Bath (July 11, 1896); and, on April 9, 1898, the eight statues of Roman emperors and generals set up on the pedestals of the balustrade above the colonnade around the Roman bath at Bath, for which he also executed the ideal bust of "Roma," at the south-west angle. Mr. Lawson was the sculptor of the statue of Burns for the Belfast Free Library, 1893; of the Royal Arms, supported by figures of Britannia and India, carved in full relief, immediately above the central niche which contains Signor Lucchese's statue of Queen Victoria in the Bridge-street front of the Victoria Art Gallery and Reference Library at Bath; the Wellington monument at Liverpool; and the statues of James Arthur at Glasgow and Joseph Pease at

Darlington. He carried out many commissions from both private and public sources in this country as well as abroad.

MR. COLIN HUNTER.—Mr. Colin Hunter, A.R.A., died on the morning of last Saturday at his residence, No. 14, Melbury-road, Kensington, aged sixty-three years. The house was designed, and we have heard, for him by Mr. J. J. Stevenson. He was a son of Mr. John Hunter, of Helensburgh, N.B., and was a native of Glasgow, where he was educated. After having been employed during four years in business, he, when twenty years of age, resolved to follow his real vocation and became a painter. In 1864 he was elected an associate member of the Royal Academy; he was a member, too, of the Royal Scottish Water-colour Society. When thirty-two years of age Mr. Colin Hunter sent to the Royal Academy exhibition his "Trawlers Waiting for Darkness." Several of his most important pictures exhibited there in the years we mention were secured for public collections, amongst them being "Their Only Harvest"—1878, purchased by the Chantry Bequest trustees; "Waiting for the Hopeward Bound"—1882, now at Adelaide; "Herring Market at Sea"—1884, acquired by the Corporation of Manchester; and "Salmon Stake-Nets"—1874, the property of the Government of Sydney. Of his other principal works we should instance, adopting the chronological order of their exhibition in the Royal Academy galleries, "Cree Way"—1875; "Digging Bait"—1876; "Silver of the Sea"—1897; "Mussel Gatherers" and "In the Cloaming"—1880; "A Pebbled Shore," and "Lobster Fishers"—1885; "The Rapids of Niagara"—1885; "The Woman's Part"—1886; "Their Share of the Toil"—1887; and "Fishers of the North Sea"—1888. He contributed, moreover, "Ireland," in 1885; "Winty Weather and the Clearing of the Herring Harvest," in 1884; "The Hills of Morven," in 1880; and "Baileys" in 1889. In 1881 Mr. Colin Hunter exhibited "The Island Harvest" in the Fine Art Society's rooms. His more recent pictures comprise "Good Night to Skye"; "Tanning the Herring-Nets"; and "Salmon Fishing on the Dee," 1895. During the past ten years or so he exhibited in the Royal Academy rooms about twenty paintings of scenes of wild life. Mr. Colin Hunter married thirty years ago a daughter of Mr. John H. Young, of Glasgow.

MR. SEVERN.—We have to announce the death on September 22, at his residence, No. 9, Earl's Court-square, S.W., in his seventy-fifth year, of Mr. Walter Severn, President of the Dudley Gallery Art Society. Born at Rome, he was the son of Joseph Severn and his wife, Elizabeth, daughter of Archibald, Lord Montgomerie, Major-General, who, in 1820 had, at no small personal sacrifice, accompanied Keats to Italy. Mr. Severn had his education at Westminster School; entering the home Civil Service, he was appointed an examiner in the Education Department of the Privy Council Office, but subsequently became known as a painter in water-colours. Amongst his works exhibited by Messrs. Agnew in 1874 was "Our Boys," rendered familiar by the highly popular engraving. Mr. Severn illustrated many of his own literary works, as well as editions of certain books—including the *Morning and Evening Services*—and Lord Houghton's "Good Night and Good Morning." He devoted most of his efforts to the cultivation of the applied arts. In an early period of his career Mr. Severn contributed largely to a revival in England of the art and practice of skilled embroidery and needlework. Nearly fifty years ago he, in collaboration with his quondam school-fellow, Charles Locke Eastlake, directed himself to the improvement of the design of textile fabrics, wall-papers, and furniture. Mr. Severn married in 1866 Mary, a daughter of the late Sir Charles Dalrymple Fergusson, Bart., who survives him.

MR. WALKER.—The death is announced of Mr. Francis Blennerhasset Walker, M.I.C.E., of Castlemaine, co. Kerry, Ireland, who died at his residence in Cheltenham on September 14, in the sixty-seventh year of his age. Mr. Walker was formerly Consulting Engineer to the Government of Madras.

PROPOSED RECONSTRUCTION OF THE MUNICIPAL BUILDINGS, ABERDEEN.—At the meeting of the Finance Committee of the Aberdeen Town Council, held on the 21st ult., the remit from the Council regarding the proposed reconstruction of the town-house buildings came under consideration, and it was decided to proceed with the modified scheme of reconstruction involving a cost of 3,000*l.*, of 4,000*l.* Mr. Rust, the City Architect, will prepare the plans for the work.

GENERAL BUILDING NEWS.

ADDITIONS TO ST. MATTHEW'S CHURCH, NEWCASTLE.—The Bishop of Newcastle recently dedicated the new portions of the aisles & porches of St. Matthew's Parish Church, Newcastle. The building work has been carried out by Mr. Thomas Weatheritt; the heat by Messrs. Dinning and Cook; the electric lighting by Messrs. Robson and Gledhill; the architects are Messrs. Hicks and Chalmers, who, as far as was practicable, have carried out the designs of the first architect, Mr. R. J. Johnson. The cost of the additions amounts to 3,900*l.*

NEW CHURCH, SOUTHPORT.—The memorial stone was recently laid of the new Holy Trinity Church, Southport. At present it is only intended to rebuild the nave and aisle at a cost of 10,000*l.* or 12,000*l.*, the building the tower, west end morning chapel, chancel and transept being deferred. The estimated cost of the complete scheme is 30,000*l.* The style of architecture is decorated Gothic. The internal arcades will rise to a height of 40*ft.*, whilst the apex of the barrel vault, which covers the nave, will be 62*ft.* above the floor level. The aisles are to be carried to a height of 32*ft.*, divided from the nave by octagonal shafts supporting moulded arches. Seven traceried windows of four lights each of different design, will illuminate the aisle and nave. Over the aisle windows will be flying arches springing from buttress to buttress, the buttresses rising above the parapet being finished with panelled and weathered gables. The transept, which has still to be built, will consist of a double bay, pierced by two traceried and shafted windows, and the roof will be vaulted and divided by moulded groin ribs. The architects are Messrs. Huon, Matear, and Simon, Liverpool.

NEW WESLEYAN CHURCH, HULL.—The foundation-stones were recently laid of the Wesleyan Church in Prince's-avenue, Hull. The building, which is from the plans of Messrs. Gelder and Kitchen, architects, is to be built in the Gothic style, with Rucon stone, slaters, and stone dressings. The elevation of Prince's-avenue will be flanked by a tower and spire. The interior will be formed with colonnade and half-open roof, with transept and organ recess, and will be fitted up with pitch-pine, providing seating accommodation for about 900 people. The contractors for the work are:—Mr. C. Houghton, bricklayer; Mr. J. Houghton, joiner; Messrs. Bower and Sons, masons; Messrs. Williamson and Sons, slaters; Mr. W. G. Padgett, plumber; and Mr. Codner, painter. The total cost of the edifice, including the site, will be 11,000*l.*

NEW PRESBYTERIAN CHURCH, BLUNDELSANDS, LIVERPOOL.—The foundation-stone of the Presbyterian church at Blundellsands was laid on the 14th inst. The buildings occupy a site at the corner of the Serpentine and Victoria-road. The main axis of the church is north and south. The principal entrance under the tower at the north-east corner. The nave is 32*ft.* wide by 5*ft.* 6 in. long, and has a centre aisle. The side aisles and transepts are separated from the nave by a series of red sandstone piers, and pointed arches. An organ chamber is provided in the south-west angle of the church, with staircases opening into it from the choir and a transept. At the north end of the building and situated over the entrance vestibule, is a gallery. The minister's vestry and choir vestry are at the south-east angle of the church, and will form a connecting link between the church and schools when the latter are built. The style adopted for the church is a late period of Gothic, with traceried windows. Externally the building will be faced with Rucon stone throughout, the roof covered with green Westmorland slates. The windows will be glazed with leaded light. Internally the arches and doorways will be of Rucon stone, and the walls will be plastered. The roof will be finished with pitch-pine boarding, relieved by ornamental moulded ribs. The church will be lighted by electricity, and an electric fan in the ventilating turret will be used for extracting vitiated air. The heating throughout will be by means of hot-water pipes and radiators on the low-pressure system. The building, which is to cost about 8,000*l.*, will accommodate 200 persons. The architects are Mr. Art Thornely, and Mr. Gilbert Fraser, of Liverpool; and the contractor Mr. Samuel Lees, Bootle.

PRIMITIVE METHODIST CHURCH, CRONSIDE, YORKSHIRE.—The memorial-stone was laid short time ago of a new Primitive Methodist church at Croaside. The new building, the design of Mr. J. P. Earle, architect, Sheffield. It is being constructed of Greenstone, with concrete dressings, and is estimated to provide seating accommodation for 200 persons. Only a chapel is now being built, but there is room in the rear for

on of vestries, etc., in future. The total will be about 9000, including the purchase of the freehold of the site.

WESLEYAN METHODIST CHAPEL, COLWYN
The foundation-stones were laid recently of a new chapel which is being erected by the Wesleyan Methodists at Colwyn Bay. The building will comprise a chapel seating 300, a Sunday school for 300 scholars, and a parlour for the connexion meetings, 1 as vestries for the minister and choir. The structure is to be in the late decorated style of architecture, the materials used being pressed bricks, with terra-cotta facades. It will be lighted by electricity.

ARTHUR BROCKLEHURST, of Manchester, is architect, and Messrs. J. Tucker and Sons, Colwyn Bay, the contractors. The work cost, including the land, etc., 7,000.

SCHOOL, GLASGOW.—A new school has been erected in Walter-street, Glasgow. The plan is that of a central hall and reading classrooms. The material is a red sandstone. The south elevation in the street has an unbroken frontage, but is relieved by pilasters and a small pedimented centre. The ground floor gives accommodation for 480 infants and juniors in six rooms, the first and second floors being in design and accommodation. The roof of the central hall is laid with wood on concrete, and the dados of the stairs and staircases, etc., are lined with pine and the finishings generally are of pine. Fresh air is admitted by air brackets fixed in the classrooms fitted with filters and regulators. The heating is by low-pressure hot-water system, and the hall and staircases are heated by radiators connected by branches to the heaters. Electric light is fitted throughout. The organ loft has been erected at the end of the school buildings. The architect of the school were Messrs. A. Lindsay and Son (Glasgow). Excluding the site, the total cost of the school was about 20,000.

The principal part of the work was under the supervision of Mr. William Arnott, consulting engineer. The various contractors were: masonry work, James Parker; carpenter work, James Brown; slater work, Hamilton and Easton; iron work, Messrs. D. King and Steel; steel work, P. and W. McLellan, Ltd.; plaster work, James Raeside; plaster work, James Raeside; cement pavior work, Messrs. J. J. McKenzie; glazier work, James Raeside; wood block flooring, The Acme Flooring; smith work, Bryden and Co.; patent roof glazing, The Heron Combination System; ironmongery, J. L. M'Indoe and Co.; tile work, W. Forbes and Co.; heating, James and Son; ventilating, Messrs. R. and Son; stair work, Jas. Laing; and T. C. Watson.

CHOICE EXTENSION, LEEDS.—The foundation-stone of the new receiving wards, which have been erected in connexion with the proposed extensions and improvements at the Leeds Union Workhouse, was laid recently. The buildings are of brick, with cast-iron columns, and will be in harmony with the existing blocks. They will be divided into sections, the block on the right of the entrance being set apart for men, and the block on the left for women. There is also to be separate day-room and dormitory accommodation for the children in each block, and every accommodation for the cases which the medical officer may consider advisable to admit to the hospital. All the upper floors will be fireproof, and there will be every accommodation for thirty patients. The principal contractors for the new buildings are Messrs. Thompson and Sons, with Mr. Fred Moore as clerk of works. The total cost of the building, which is being erected from the plans of Messrs. Winn and Sons, is about 7,000.

ELEVATING AND STORAGE PLANT, DALTON
WORKS.—The Dalton Main Collieries Company, Rotherham, are erecting a coal elevating and storage plant on a large scale. The plant includes a storage bunker, 800 tons capacity, with suitable outlet doors; a bucket elevator to carry the coal from the ground to the top of the storage bunker; and a conveying system of the push-plate type, with a bunker, with the roofing and necessary structural work for supporting the elevators and principals. The bunker is to be built up of mild steel plates, riveted to an iron framing, tied together by flat-bar bolts, and the side plates stiffened by diagonal channels on each side running the length, with tee-iron vertical stiffeners. The channels rolled steel joists, 20 ft. apart, to support the sloping end of the bunker. Thirty-four sliding outlet doors of mild steel plates, and supplied with wrought-iron handles and hand levers for operating them, are fitted to the bottom of the bunker.

The elevator, running from the ground-level to the top of the bunker, is to be of the case-in-type, and 82 ft. between centres. The driving and trailing shafts are to be provided with cast-iron spoked wheels. For delivering the coal from the elevator to the conveyor, a discharge shoot, built up of 4-in. thick mild steel plates, riveted to 2-in. angle-iron framing, and firmly secured to the elevator head, will be furnished. The conveyor for distributing the coal over the bunker is a 24-in. push-plate, 71 ft. between centres. The framework for this conveyor will be of channel irons riveted to bottom plates, which constitute the trough, angle-iron stand-offs and top runners to be used for the return chain. Eight standard sliding outlet doors, with the necessary wrought-iron levers and brackets for operating them, are to be provided for the conveyor. The work is being carried out by Messrs. Graham, Morton, and Co., of Leeds.

HALL AND SCHOOLS, OXFORD.—The Wesleyan Hall and schools, which have been erected at the corner of Junee-street, Oxford, were opened recently. The hall is in the Renaissance style, built of Hambrough stone, with Bath stone dressing. The entire site is surrounded by a dwarf stone wall, surmounted by an iron palisading. The principal entrance is from the south-east angle, a flagged pathway leading to the entrance porch, which opens into two lobbies, the gallery being approached by a staircase under a tower in the right-hand corner. The gallery, supported on columns, runs round the school of the interior and behind the rostrum is the organ loft, with choir vestries on either side. The building has a hammer-beam roof, filled in with panels, and with moulded purlins. The organ loft is approached by a back staircase, and also by a staircase from the rostrum, leading through the choir seats. The furnishing throughout is of pitch-pine open seats, varnished in two tints, seating accommodation being provided for 750 persons. The chapel is lighted by electricity, the work having been carried out by Messrs. Hill, Upton, and Co. It is heated by the low-pressure hot-water system, the work of Messrs. Ison, Kidman, and Watts. The means of ventilation are both from patent tubes in the walls, the windows, and a patent extracting pump in the centre of the roof. The carving is by Mr. W. H. Feldon. The schools are built entirely of brick, and are detached from the hall. The body of the structure forms a central school, 44 ft. by 40 ft., open up to the roof, with a balcony on either side at the first-floor level. On the ground floor are also the juniors' school, infants' school, classroom, and two entrance lobbies. On the first floor is the guild-room, which is 24 ft. by 44 ft., on the south, and at the north end are two classrooms. The school affords accommodation for about 500 children. Like the chapel, it is electrically lighted and heated by hot water. The architect was Mr. Stephen Salter, Oxford, and the contractors Messrs. T. H. King-gerlee and Sons, also of Oxford.

CO-OPERATIVE BUILDINGS, IPSWICH.—A new branch of the Ipswich Industrial Co-operative Society has been opened in Bramford-lane and Surbiton-road, Ipswich. The building is in red brick, comprising in the front a grocery and butcher's shop. There are underground cellars and a cold storage in white glazed brick. A warehouse accommodation is provided, and there are two living-rooms, a kitchen, and three bedrooms for the manager, this portion being approached by a private entrance. Mr. S. Skerritt was the builder, and Messrs. Eades and Johns the architects. The contract price was nearly 1,7000, and the price of the land 2100.

NEW LAUNDRY FOR THE WOOLWICH UNION INFIRMARY.—Plans have been prepared by Mr. C. W. Brooks, architect, for a new laundry which is about to be erected at the infirmary of the Woolwich Union.

WORKHOUSE EXTENSION, SOUTH SHIELDS.—The extension of the Harton Workhouse, South Shields, by the provision of a nurses' home, with accommodation for twenty-four nurses and servants, has been completed. On the ground floor of the new buildings there are probationer nurses' sitting-room and dining-room, with a folding partition, so that the rooms may be used for the purpose of lectures and recreation. There are also superintendant nurses' sitting-room, and charge nurses' sitting-room, with ample kitchen and scullery accommodation, at the rear. Twenty-four bedrooms are provided on the first and second floors. The contracting work has been executed by Mr. J. J. Moore, of South Shields, and Mr. J. H. Morton, also of South Shields, was the architect.

PREMISES, WOOD-STREET, LONDON.—The new offices which are being erected in Wood-street, City, are now nearing completion. The structure is of stone and has a Mansard roof and dormer windows. The lighting areas are

faced with white glazed bricks. A hydraulic passenger and goods lift is provided to all the upper floors, of which there are five, and in addition there are two staircases. The main supports of the building are of solid steel, protected by fireproof materials; the window sashes are also of steel, and wire glazing is used in skylights. The architect is Mr. George Vickery, and the builders are Messrs. Kilby and Cayford.

CHARLES GARRETT MEMORIAL HALL, LIVERPOOL.—The laying of the foundation-stones of the new central hall of the Liverpool Wesleyan Mission, which is to be erected as a memorial to the Rev. Charles Garrett, took place recently. The site of the building is at the corner of Renshaw-street and Upper Newington. The principal hall will seat 2,500 persons, and the smaller one 750, both being accessible from the street level. There will also be reception and crush halls, vestries for Sunday School work, clubrooms for social work, drill hall, and convenient administration offices. Shops with showrooms and offices will be placed in the main portion of the Renshaw-street and Upper Newington frontages. The total cost, with furnishings and organ, is estimated at 37,2500. The architects are Messrs. Bradshaw and Cass, of Bolton.

TEMPERANCE HALL, YEADON, LEEDS.—Memorial-stones were laid recently in connexion with a new hall which is being erected for the Yeadon Temperance Society, at Yeadon. The building, the designs for which have been prepared by Mr. Harold Chippindale, architect, of Guiseley, will occupy a position on the Green. The cost will be about 2,0000, and besides a number of smaller rooms, caretaker's residence, and one or two shops to the front, there will be an assembly-room capable of accommodating from 700 to 800 persons. The mason's work is being executed by Messrs. W. Flesher and Sons, of Yeadon.

NEW FIRE STATION, BRADFORD.—The memorial-stone of the new district fire station, which is in course of erection at Odsal Top, Bradford, was laid a short time ago. The building stands on a site at the junction of the Cleckheaton and Huddersfield roads, and advantage has been taken of the opportunity afforded by the works to make a street improvement. The plans for the work have been prepared by the City Architect, Mr. F. E. P. Edwards. In the centre of the structure will be the engine-house, with stabling for four horses immediately in the rear. Opening out of the engine-room on the one side will be a watch-room for the officer in charge, and beyond this a recreation-room for the men who are off duty. On the other side of the engine-room is a workshop for repairs, and a room for the Camewell fire-alarm apparatus and the telephones. Behind the stables is an open yard, and beyond are houses for five men. Dwelling-houses for the station officer and for the driver of the engine are provided on an upper story over the engine-house. The total cost of the land and building will be 5,0000.

ISLINGTON WORKHOUSE ADDITIONS.—The Islington Board of Guardians received an order from the Local Government Board on Wednesday authorising the carrying out of alterations and additions to the Cornwallis-road workhouse, at an estimated cost of 5,5000.

EXTENSION OF FACTORY, LIVERPOOL.—The Lord Mayor of London (Sir James T. Ritchie, Bart.) laid the foundation-stone, on the 23rd inst., of new buildings which form an extension of the Phoenix Safe Works in Smithdown-lane, Liverpool. The building, when completed, will extend 300 ft. along Aigburth-street and 127 ft. along Smithdown-lane, covering an area of about 3 acres. The premises are to be constructed of brick, with Whitehaven stone dressings. They will be divided into three bays, and each will be fitted with a powerful electric travelling crane for lifting and transferring work in progress from one section to another. Galleries are to be erected on three sides of the new building, and these will be used for the lighter manufactures of the Company, the main building being reserved for the manufacture of safes, bankers' armour-plated strong-rooms, and strong-room fittings. The architect of the building is Mr. F. H. Oldham, of Manchester, and the contractors are Messrs. W. Brown and Son, of Salford.

STAINED GLASS AND DECORATION.

REVERED, ST. MUTHEW'S CHURCH, IPSWICH.
A new reredos, designed by Mr. J. Shewell Corder, architect, of Ipswich and executed by Messrs. Percy Bacon and Brothers, of London, has been inaugurated at this church. It is constructed of oak, and extends across the entire width of the chancel. The centre portion is divided into five panels, three of which are carved in high relief and coloured

beneath cusped and carved traceried canopies, surmounted by a carved cornice and cresting, the whole relieved and enriched by gilding. The centre panel exhibits the Nativity, the panel on its right showing the Shepherds, and the panel on its left the Magi. Flanking these panels, and divided from them by pinnacles, are two painted panels on the flat, representing the Annunciation, the one on the left depicting the Angel Gabriel, and the one on the right the Virgin. The centre portion of the reredos is divided from the wings by two more pinnacles of greater size, rising higher and containing niches, in one of which is placed the figure of St. Matthew, and in the other the figure of St. John. The wings extend on either side with cusped and traceried panels, divided by bands of carving, and surmounted by a carved cornice of angels with cresting over. The extremities of the reredos are terminated by carved and traceried pillars, each surmounted by an angel in a devotional attitude.

MURAL PAINTING FOR A PLYMOUTH CHURCH.—Mr. E. A. Fellows Fryne has on view a mural decoration, "The Church Triumphant," designed as a memorial painting to fill the space over the chancel arch of St. Peter's, Plymouth. It is a decorative and symbolical treatment of the attitude of Christ and the angels—and saints departed—to the saints on earth. In the centre over the crown of the arch is the figure of Our Lord robed in priestly garb, and around the vesica glori are seven cherub angels and a rainbow, and grouped at the feet of Christ are the Holy Innocents. On the right are the Virgin and St. Joseph, and on the left are St. John the Baptist and Mary Magdalene. Seated on clouds and grouped in segmental sweeps on either side of the central figures are the Apostles, Evangelists, Saints, and Martyrs, figures representing the arts, with higher sweeping tiers of a multitude of angels and spirits. Three flying angels fill the fore space on either side of the vesica, symbolic of Incense, Prayer, Passion, Sacrifice, Harps, and Praise. In the lower part of the picture are figures of the four Latin fathers, representing Theology. Adam and Eve on the extreme right and left represent the human race, and on the right are the patriarchs, balanced on the left by figures of Sarah and Ruth; on either side are the rulers of Israel. Lower down is a semicircular row of the prophets seated on clouds. In the spandrels are the Magi and figures of a slave and cripples; the lower portions of the spandrels are filled with the two Archangels Gabriel and Michael. It is altogether a fine conception, handled in a scholarly way. The composition leads in sweeping segmental tiers of grouping to the central figure of Our Lord, which stands dominant over all, and behind which the multitude of angels and spirits recede in delightful mystery. It is impossible to judge of the colour effect of such a painting before it has been fixed in position, and one hopes that the delicacy which is so charming in the studio may not be lost in the comparative gloom of its ultimate surroundings. The two windows above and on the same plane as the picture occur somewhat unapplyingly. Mr. Fryne has in hand the completion of the scheme of decoration in the friezes under the clearstory windows, the subject of which is the life of St. Peter. The church was designed by Mr. Fellows Fryne, brother of the artist.

FOREIGN.

FRANCE.—It is announced that the old building of the Faculté de Médecine (Rue de la Bûcherie), the Hôtel de Lauzun, the Church of L'Assomption, the Dupuytren Museum, and the church of the Abbey of Port Royal, are to be classed as Monuments Historiques. —The Société Nationale des Architectes Français has given, as the programme of its next competition, "Un établissement des Bains et d'Hydrothérapie dans le Faubourg d'une Grande Ville."—The Department of Assistance Publique at Paris is undertaking some important architectural works, among them the erection of a new hospital at Aubervilliers.—M. Constantin Mounier has been commissioned to execute a monument to Zola, the model for which he will submit shortly for acceptance.—A monument to André Chénier, the poet, is to be erected in the Carrefour de la Muette.—The Municipality of Vichy are about to erect new post-office buildings, at an estimated cost of 450,000 francs.—The General Council of La Charente has decided on the erection, at Angoulême, of a departmental hospital for aged men who are infirm or incurable.—A new departmental lunatic asylum has been opened at La Charité-sur-Loire.

GERMANY.—A new theatre is to be built at Charlottenburg from the designs of Messrs. Heilmann and Littmann, of Munich.

SWITZERLAND.—Important alterations and extensions are to be undertaken at Lausanne, which the "Commission d'Art Public," consisting of five architects, has under consideration.

INDIA.—A large station is in course of erection at Santragachi, on the Bengal-Nagpur Railway.—Electrical lighting is being considerably developed in Madras, and the National Bank there has just been fitted with electric light and electrically-driven punkahs.—At Bombay University the subject for the Sir G. Legrand Jacob prize for next year is "The advantage derived from the development of irrigation during the last fifty years in the Bombay Presidency, and the directions in which further development is possible." Competitors must be graduates or undergraduates of the University of Bombay.—The question of the drainage of Rangoon is occupying a good deal of attention. The drainage system was laid out by Messrs. Shope and Ault, but is said to be getting into an unsatisfactory state owing to want of sufficient and intelligent supervision. Mr. Ault has accepted an invitation to visit Rangoon and make recommendations for the improvement of the drainage.

—A length of road in Calcutta is to be laid with Val de Travers asphalt, as an experiment in regard to its suitability for the climate. If successful, it is expected that its use on roads in India will be extended.

PUBLIC WORKS IN NATAL.—Bills have passed the Natal Parliament authorising the Municipality of Pietermaritzburg to contract a loan of 200,000*l.* for the completion of the scheme of water supply for the town, and authorising the Municipality of Durban to contract a loan of 900,000*l.* to be expended on various public works, including 200,000*l.* for the construction of municipal offices, library, museum, etc., 150,000*l.* for drainage and sewage, 150,000*l.* for an electric department, 150,000*l.* for waterworks, and 50,000*l.* for tramway extensions.

SANITARY AND ENGINEERING NEWS.

BRIDGE OVER THE RIVER REDE, NORTH-UMBERLAND.—The new bridge erected over the river Rede at Reedsmouth, near Bellingham, was opened a short time ago. The structure is built on two stone piers, and has three spans of 42 ft. each. The framework consists of steel girders embedded in concrete. The roadway is constructed of cross-girders with expanded metal and ties embedded in 2 ft. of concrete. The expanded metal is carried round the girders and into projecting mouldings, binding the whole together. The work has been carried out by Messrs. John Rule, of Sunderland and Newcastle, to the order of the Bellingham Rural District Council, the general work being under the supervision of their Surveyor, Mr. R. E. Riddle.

MISCELLANEOUS.

LOCAL IMPROVEMENTS AT BRENTFORD.—Plans and designs for the new market have been prepared by Mr. Nowell Parr, C.E., Engineer and Surveyor to the Brentford Urban District Council, who is architect of the proposed manual training and cookery centre at the Ealing-road Council School, with two additional classrooms for 120 children. Brentford Market claims to have been established 600 years ago; it has lately fallen into disrepute, yielding very little profit. The new buildings will extend over an area of 155 ft. by 350 ft., and consist of three covered avenues, with numerous shops and stalls, spaces being reserved for the holding of sales. The tender for the new market works by Messrs. Dorey and Co., of Brentford, amounts to 45,302*l.*

A BUILDERS' EXCHANGE, BIRMINGHAM.—We learn that the leading men engaged in the building and cognate trades at Birmingham are taking measures for the establishment of a Builders' Exchange in that city. The exchange is intended to furnish means for the exhibition of samples of builders' materials, with exemplars of machinery and appliances used in constructional works. The hall will be opened to subscribers and exhibitors for the purpose of meeting and consulting their fellow-traders and customers, and for affording a business resort for architects, manufacturers, builders, and builders' merchants. The project extends to the starting of an authorised intermediary periodical and the opening of a department for inventions.

THE TAPESTRY WORKS, OLD WINDSOR.—A few days ago Mr. Ricardo, of the Friary, Old Windsor, purchased for 2,400*l.* at auction the picturesque group of buildings known as the "Tapestry Cottages" at Old Windsor. The twelve houses and a large central hall stand in about three acres of ground, and

are held under a lease from the Crown for a term of ninety-nine years from October 1881, at a ground rent of 46*l.* per annum granted to the late Prince Leopold, Duke of Albany. The buildings were erected, at a cost of some 9,000*l.*, in furtherance of a project, warmly espoused by the Duke, for the revival of the tapestry-weaving industry in England. Instructions were brought over from France, and of the many beautiful specimens of the handicraft which were woven, designs made by the best artists some were purchased by Queen Victoria for Windsor Castle and by members of the Royal Family. Latterly, however, the industry dwindled for lack of sufficient encouragement, and the party is managed by Sir Robert Collins, Controller of the Household to the Duke of Albany, who has let the cottages originally built for the weavers—at rents amounting to the aggregate to 235*l.* 4*s.* per annum, the being rented by Mr. Francis Ricardo of half of the inhabitants of the village.

FAWCETT'S IMPROVED FLOOR SYSTEM.—In ordinary form of the Fawcett system for construction of floors, ceilings, and the essential feature is the employment of tubular lintels fitting between ordinary steel joists, the lintels having profiles which protect the lower flanges of the joists and ribs which afford a key for the concrete filling and for the plaster ceiling. Concomitant with the section of a floor panel so built may be said that the area below the panel possesses little or no tensile strength, being more deficient in this respect than some part of a floor formed of concrete slabs while the area above the neutral axis, being largely composed of concrete, is capable of resisting compressive stress to some extent. Consequently, the upper flanges of the joists are relieved in a measure of compression and the resistance of the structure to deflection is somewhat greater than that which is usually necessary. The result is that part of the metal in the upper flanges of the joists represents waste of material, and it may be remarked that the same condition obtains in the case of all floors consisting of corrugated steel joists.

In the latest form of the Fawcett floor recognition is made of the compressive strength of the concrete employed above the hollow lintels, as well as of the small proportion possessed by the upper portions of the lintels themselves. Accordingly the patent granted this year to Mr. Fawcett, iron or steel joists are employed above upper flanges of which are of smaller sectioned area than the lower flanges. It is claimed that in this way metal can be economised in the joists, and that, at the same time, strength and fire-resisting properties be increased, as the larger lower flanges afford more resistance to tensile stresses and do not longer become heated. The first result appears to be as good as the second and third are bad. Metal will certainly be saved, taking into account the compressive resistance of the concrete. But if the amount so saved is applied to the purpose of giving strength to the lower flanges, the money saving is at once lost. It is true, however, that a floor can be built on the new system on one of the old system and without increased expenditure. Again, it scarcely wise to recommend larger masses of metal for the purpose of resisting deflection. Every increase in the surface of metal employed means increased danger and involves greater outlay in protective material. These criticisms merely refer to the claims made in the patent, and do not imply want of appreciation of the improvement itself, which, representing an approach towards the principle underlying true concrete-steel construction, is distinctly worthy of adoption. We understand that the patentees have taken considerable trouble to ascertain by actual experiments the correct proportions of the new joists, which will not be applied exclusively in connexion with the Fawcett system, but can be obtained for general use with any forms of concrete floor construction.

PRIZES FOR COTTAGES, GARDENS, &c.—Charles Birchall, who owns a property known as the Cottages, Wheatland-lane, Seacombe, Cheshire, has, for some time, encouraged his tenants to beautify their gardens by awarding annually prizes for best-kept gardens, window boxes, and flower boxes in connexion with these cottages. Last summer's awards were distributed last week in the Wesleyan Mission Room, Oldisle, in the presence of a large gathering of the tenants and their friends. Mr. Birchall said the object of awarding those prizes was to note, as well as he could, their own well-being. He would like to see them taking a deep interest in home life, to make their surroundings comfortable and attractive, and he would be pleased to help them in that direction. He did not limit the competi-

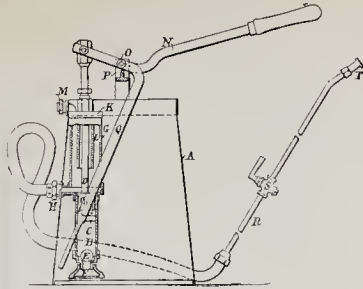
men, but gave encouragement to their by offering prizes for the best-kept w boxes. They could do it, and it did st much either financially or in labour. er speaker, noticing that there were a or of children present, said it would be ouragement to them if there was a priz for the best gathered bunch of wild s. The following tenants were awarded:—1st, Mr. F. Hughes, 29, Wheatland- 2nd, Miss Surrell, 31, Wheatland-lane. Ir. Morris, 1, Sefton-cottages; 2nd, Mr. ts, 2, Cavendish-cottages; 2nd, Mr. 5, Russell-cottages. 1st, Mr. Rogers, ftesbury-cottages.

RAISING HOUSES BY THE "RÜCKGAUER" M.—At Goppingen, in Württemberg, a has been raised under the supervision architect from Stuttgart, Mr. Rück- the object of raising the building being use the available space for shops. The was first supported by a strong timbe ing composed of baulks of suitable ec- esicidistis platform the walls were strutt- ed timber struts, especially at the angles, is stage there was inserted a form of with threads of low pitch, thus allow- ing building to be raised to a very small : these jacks constitute the patent on the system is based. They are capable staining a load of 50 tons. On these nos rest strong piers, and on these again ouse to be raised. Operations began ugust 15 at 6 a.m. By half-past nine e been raised 5 ft., and by half-past one eached the required height. During the ions, which were carried out with com- ease and without shocks, the house od inhabited, and inside there was not ash crack to be seen. A crowd assembled the site especially builders, engineers, thers connected with the building trade, tch the proceedings. We may say that inventor of the system, Mr. Rückgauer, thortly commence similar operations on a at Ulm.

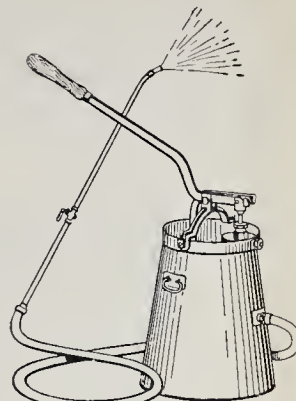
ENT NOTES.—It is stated by Mr. Sev- Bell, British Commercial Agent in the d States, that during the fiscal year the imports of cement received at the of San Francisco, New York, Galveston, Baltimore were of the aggregate value 1,993,303, the countries of origin in approximate order of importance as re- value being Germany, Belgium, and United Kingdom. The Acting British l at Lourenço Marques, in his report for et year, remarks:—"Germany has gain- ed most of the cement used locally, and appears to be able to put it in the t, at a slightly lower price than is d for the British article. The total t imported (about 7,700 tons) is no comparatively small, but in view of arbour and other public works which are undertaken, the demand is bound to so, and it might be worth the while of manufacturers to look into the on."

CHAIR, MARYLEBONE.—The Mary- lebone Council Chamber has recently been refurbished by Messrs. Oetzmann and under the supervision of Mr. Herbert nsky, the furniture expert to the Metro- n Asylums Board. The preparation of a e scheme was one of some difficulty, was desirable to preserve the character old building, which has many historical ations. Part of the town hall is the fatch House, of early XVIIIth century. The general style selected is of the French Renaissance period, the wood- being throughout of oak, fumigated to a golden brown. The seats, in the form of boxes, each with a dual desk in front, upholstered in a specially-prepared e cowhide, in colour very nearly match- ing the oak. The table in front of the ros- ter for the chairman of committees is a example of cabinet work, the top, 18 ft. t, 6 in., is 2 in. thick, and flush-panelled t panels with the grain of the wood g diagonally; it is supported on seven d fluted columns with underframing. The rostrum front is panelled, and eze carved, with columns and carved ls on the corners. The panelling at the of massive oak, with fluted and moulded ers. The mayoral chair is also in oak, dered in cowhide to match the settees, the arms of Saint Marylebone carved a pediment. The whole scheme, in the ed light of the council chamber, pro- a rich golden effect.

WHITEWASHING AND SPRAYING MACHINE.—accompanying cuts show the outer rance and the working section of Messrs. ell's type K spraying machine for paint itewash. In constructing the spraying atus according to this invention, a con- A is provided, somewhat conical in order to provide a larger base to in- the stability of the apparatus, and



- T—Spray Nozzle.
- S—Cock in Spray Rod for Starting and Turning off the Spray.
- R—Spray Pipe.
- A—Container for Whitewash, Limewashing, etc.
- N—Rocking Lever Handle.
- P—Pivot on which the Handle Works.
- K—The Lid of Container.
- H—Connexion between Pump and Hose. (This can be made long or short, as may be desired.)
- D—Pump Barrel.
- C—Pigtail.
- G—Mechanical Agitator attached to Rocking Lever Handle.



Exterior View.

Wallach's Spraying Machine (Type K).

according to its dimensions, although not shown in the drawing, the apparatus may be provided with runners or wheels for transporting it from place to place. Secured in a vertical position to the interior of the container A is the pump and pressure chamber device, consisting of a pump barrel D, containing a valved pump bucket carried by a pump rod, and co-operating with a back pressure valve at the base of the pump barrel. The lower suction passage of the pump barrel is fitted with a straining nozzle at a short distance from the base of the container. Connected to the upper end of the pump barrel is a cylinder, from the base of which there extends a nozzle pipe, to which is connected a strong flexible tube through which the liquid is delivered to a spraying nozzle. The upper end of the pressure cylinder is closed by a cover provided with a packed gland, through which the pump rod passes. The upper end of the pump rod is forked, and receives a pivot which connects it to a hand-operated lever. Upon the liquid to be sprayed, such as white-wash, being placed into the container and the operating handle worked, the pump bucket will be reciprocated in the pump barrel and the liquid drawn through the strainer into the barrel below the bucket; upon the descent of the pump bucket, the liquid will pass above the latter, and then upon the next movement will be forced upwards into the pressure chamber; and as the pressure increases in the chamber the liquid will be driven through the flexible pipe and out by the spraying nozzle for application to the surfaces which it is desired to treat with the liquid so forced. At the same time that this operation is proceeding, the agitating lever will be rocked backwards and forwards through the liquid in the container and prevent settlement.

BRITISH WHITE LEAD AND VARNISH.—In a lengthy report on the trade of Odessa, Mr. Bosanquet, acting British Consul, remarks that the best white lead is still supplied by the United Kingdom, and, indeed, the secret of its undoubted superiority over any quality of the substance which can be produced in Russia has up to the present time been carefully kept. Inferior qualities are manufactured locally, but cannot at present rival the British-made product. An increase in the duty is anticipated, which, if enforced, will probably reduce the quantity of import, though it will continue to be imported for those purposes where the very best kind is essential. Verdgris is mainly imported, but ultramarine is produced locally, and has, he understands, no foreign rival of sufficient merit to compete with it successfully. The best varnish still comes from the United Kingdom, but varnish of a good quality reaches Odessa from Moscow, where it is manufactured.

WAR MEMORIAL, YORK.—A memorial to the officers, non-commissioned officers, and men of the Duke of Wellington's West Riding Regiment who lost their lives during the South African war was recently unveiled in York Minster. The monument has been designed by Mr. G. F. Bodley, R.A., and occupies a position on the west wall of the south transept, close to other memorials of the regiment. It is of white marble, with a central

tablet of brass containing the names of the fallen, flanked on each side with a bronze figure of a khaki-clad warrior. Above the names on the brasswork is a decorative representation of the white roses of York, and on the wall above the memorial are representations in brass and black enamel of the two badges of the regiment.

NATIONAL ASSOCIATION OF MASTER HOUSE-PAINTERS AND DECORATORS.—This Association held their annual dinner last week at the Midland Hotel, Manchester. Councillor J. Higson (President) was in the chair. The Lord Mayor of Manchester, in reply to the toast of "The Municipalities of Manchester and Salford," congratulated the Association on the excellent exhibition, and spoke highly of the work of the students. The decorative art had, he said, made a considerable advance since his young days. Mr. J. D. Grace, President of the Institute of British Decorators, proposed "Architecture and the Arts," and Mr. J. W. Beaumont responded. The latter gentleman said that the Municipality of Manchester was doing a great work with regard to architecture by establishing a school of architecture. He suggested, if the City Council decided to build a City Art Gallery, that the formation of an architectural museum would be an excellent addition. Mr. John Sibthorpe, proposed the toast of the Master House-Painters Association, and the President, responding, spoke of the efforts being made to establish a board of arbitration. They wanted local arbitration boards in every centre in England and Wales, and if they disagreed on any question submitted to them the services of a national board should be requisitioned. Failing the latter a referee would be called in to give a decision on any disputed points between masters and men.

THE HOUSING QUESTION IN SOUTH WALES.—A conference of representatives of the mining and other industries in South Wales was held in the Town Hall, Merthyr, on the 24th ult. Mr. Keir Hardie, M.P., presided, and in his opening remarks said that the importance of the housing question could hardly be exaggerated. He did not think that local authorities ought to begin by providing houses for the poorest of the working classes. He rather suggested that they should build for the better class of artisans, and thus make more room for the poorer workers, and to that extent avoid the danger of raising rents. He advocated the taxing of all land, particularly of unoccupied land. During the last ten years there had been a slight decrease in overcrowding. Local authorities should have the power to lay out the plans of new building areas and to schedule adjacent land. Colliery villages should be prohibited, and central towns built for the miners; but this, of course, was still in the future. Mr. R. Williams (London), in the course of a paper which was read, argued that the decrease in overcrowding shown in the census returns was illusory, and he advocated the compulsory requirement in all houses of at least as much cubic space of air as is required for prisoners, policemen, and soldiers. Resolutions in support of the objects of the conference were carried unanimously.

BELGIAN CEMENT.—The cement industry in Belgium, according to the report of Mr. Consul-General Hertslet, made good progress, as far as the export trade was concerned, in 1903, the figures being 599,091 tons, with a value of 623,040*l.*, increases of 10 per cent. on the volume and 2.5 per cent. on the value over 1902. The countries to which large quantities of this material were exported were the United Kingdom (208,159 tons, valued at 215,484*l.*), Canada (23,717 tons), Cape Colony (22,906 tons), the United States (90,137 tons), and the Netherlands (51,308 tons).

CAPITAL AND LABOUR.

STATE OF THE BUILDING TRADE IN AUGUST.—According to returns supplied by seventy-three employers' associations, whose members are estimated to employ about 84,000 building operatives of all classes, and by trade unions, with an aggregate membership of about 185,000, employment in the building trades continued dull during August, and on the whole showed little change as compared with July. It is, however, rather worse than a year ago. With bricklayers employment is dull, but improving, and somewhat better than last month, and about the same as a year ago. It is moderate with masons; not so good as a month ago in England, but rather better in Scotland. With carpenters and joiners employment is bad: worse than a month ago in England, but much the same in Scotland. The percentage of unemployed trade union carpenters and joiners was 5.9 at the end of August, compared with 5.7 in July and 2.9 a year ago. Employment with painters generally is bad, and worse than a month ago and a year ago. With plasterers it is much the same as a month ago and worse than a year ago. With plumbers employment is reported as rather better than a month ago. The percentage of unemployed trade union plumbers was 2.9 at the end of August, compared with 10.4 at the end of July and 7.1 a year ago. With slaters and tilers in England and Ireland employment is bad, slightly better than a month ago, but worse than a year ago; in Scotland it is quiet.—*Labour Gazette.*

SETTLEMENT OF THE MIDDLESBROUGH PLASTERERS' AND BRICKLAYERS' DISPUTES.—After a six months' strike against a reduction of wages, the bricklayers and plasterers of Middlesbrough, Stockton, Thornaby-on-Tees, and West Hartlepool resumed work on the 26th ult. The operatives a fortnight ago consented to a reduction of a halfpenny per hour together with certain alterations of working rules against a penny originally asked by the Teesside master builders, but the labourers held out until Saturday, when they agreed to a somewhat similar reduction.

Legal.

AN ARCHITECT'S FEES.

At the City of London Court on the 21st ult. before His Honour Judge Rentoul, K.C. Mr. T. M. Garrod, architect, Birkbeck Bank Chambers, sued Mr. Charles Butcher, Ewell-road, Surbiton, for ten guineas for preparing plans. The plaintiff's case was that he acted as the architect of some houses which were being built at Surbiton. The defendant was the builder. An arrangement was made by which the plaintiff was to be paid his fees of 3*l.* guineas per cent. on the advances made by the freeholders to the defendant. The plaintiff was instructed to let the adjoining land. He agreed to let it on a building lease to the defendant. The latter gave instructions to the plaintiff to prepare the drawings, and agreed to pay the same fees as before. The plans were prepared, but the defendant decided to dispense with the plaintiff's services. He (the plaintiff) now sued for ten guineas for preparing the drawings. Of course, if the matter had gone through the plaintiff would have received 3*l.* guineas per cent. on the advances. As there were seven houses, on which 150*l.* was to be advanced, his remuneration would then have been much larger. The defendant's case was that he never employed the plaintiff to prepare the drawings. He decided not to appoint him as the architect because his fees were too high. As a fact the buildings were erected from plans supplied by a Mr. Mason, whose fees were 2*l.* guineas per cent. on the amount advanced. The plaintiff alleged that his drawings were used, and pointed out that, where his drawings and Mr. Mason's varied, the latter's had not been followed. The Judge said he was in favour of the plaintiff, but, at the same time, he was in a difficulty and scarcely knew what to do. He would take a timid way of getting out of the difficulty by giving judgment for the plaintiff for five guineas.—*City Press.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

20,775 of 1903.—R. F. POCHLIN and H. S. POCHLIN: *Breaking, Crushing, and Grinding Machinery.*

A method of ensuring an evenly distributed and regular supply of material to stone-breaking or analogous machines, which consists in directing said material to an adjustable outlet of a hopper, and thence over one or more revolving feed rollers.

22,109 of 1903.—E. S. LOCIER: *A Combination of a Fire Shield and Cinder Screen for use in Kitchen Ranges and other Grates.*

A device for improving the combination or attachment together of ashpans and fire-front shields for grates and ranges by means of stout framing of sheet iron, or other suitable material, formed to fit into the ashpan fender and to cover the open front of the fire grate, having the front shield and cinder screen attached thereto.

22,619 of 1903.—J. W. FRYAR: *Lifting Tackle.* This invention relates more particularly to the supporting tackle of colliery cages, the object being to distribute the weight of the cage equally between the four chains by which it is carried, but it may be applied to other lifting tackle in which chains or ropes are used. The invention is carried out as follows when applied to a cage carried by four chains; for example, the end of the winding rope is attached in any suitable manner to a swing plate, which is preferably of a triangular form, the lower corners of which are pivotally secured two links, each carrying a similar triangular swing plate provided with links or like connexions to which the chains are secured, and this combination automatically adjusts the strain of the weight upon each chain equally.

23,196 of 1903.—H. J. HOSKINS: *Method of Protecting Earthenware Chimney Pots and other Fragile Goods in Transit in Railway Waggons and other Vehicles.*

An apparatus for protecting chimney pots and other pottery goods in transit in railway and other waggons, comprising frames composed of horizontal and vertical members, being rails and posts, set at suitable distances apart by means of readily detachable struts or distance pieces, to form with such pieces skeleton cells or sections of fencing for guarding the goods, such fencing being adapted to be readily unshipped and piled flatwise for return transit.

4,056 of 1904.—J. H. WILKINSON: *Heating Appliances Applicable to Fire Grates, Stoves, and the like.*

A radiating or auxiliary heating appliance for use in connexion with domestic fire grates, stoves, and the like, comprising a cylindrical or other radiator, means by which the same may be suspended or supported in front of the fire, and means for adjusting the position of the appliance.

12,687 of 1904.—R. C. MATHEWSON: *Apparatus for Saving, Dressing, and Polishing Stone, and the like.*

The sawing of stone, and the like, consisting in the combination of blocks of carborundum, corundum, or emery with saw blades, such blocks being carried in serrations with V-edges in the periphery of the blades, and held in position by a pin or pins.

14,027 of 1904.—C. G. WOODS: *Window Screens.*

A window screen, consisting of rigid clamping-plates extending inwardly from the sides of the window casing, a spring roller mounted at the upper end of the window, a guide roller, a screen attached to the spring roller and extending over the guide roller and downwardly in front of the rigid clamping-plates, movable clamping-plates in front of the screen and having cam slots, studs extending from the window casing through the cam slots, and bell-crank levers pivotally connected to the window casing and to the movable clamping-plates to move the movable clamping-plates to and from the screen.

15,016 of 1904.—J. WILMSHURST: *Door and Gate Closing Apparatus.*

A self-closing door apparatus, consisting of a central rod hinged to the door post, a central bracket fixed to the door, coil springs on each side thereof, adjustable collars upon the rod, and telescopic encasing tubes on each side of the central bracket.

15,402 of 1904.—J. A. FERGUSON and F. E. KIDDER: *Building Blocks and Walls.*

A wall composed of a plurality of blocks, said blocks having each a headless projection and the blocks arranged with the projections

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

alternately oppositely disposed, said blocks arranged in juxtaposition to form a pl. of air spaces intermediate the inner outer faces of the wall.

16,669 of 1904.—G. HARRIS: *Fastening Windows, and the like.*

Fastenings for window frames, and the like, consisting in the combination of a thumb bolt provided with a handle and nose, with a threaded sleeve attached to a plate and a plain or other surface plate.

19,676 of 1903.—J. H. MAGENS: *Treatment of Concrete, and the like, whereby the same after Mixture may be Arrested.*

A method of preparing and storing mixed cement, concrete, cement, concrete mortar, and the like without its setting or binding power, which consists in cooling the constituent parts, they are mixed together, below the air temperature prevailing at the time being, maintaining the mixture in such cooled until it is used.

22,245 of 1903.—J. DUCKETT and SON, and W. C. LAWTON: *Street Gullies.*

A trap or seal movably fitted inside a gully, and having its trapping extremity extending downwards into the trapping chamber and its mouth arranged to fit into the edge of gully.

3,556 of 1904.—L. G. MUTTHER: *Process Means for Imparting a Velocity Appear to the Walls of Rooms, Doors, Fences, and the like.*

A process for the direct flock-papering, velveting of walls or partitions of rooms, doors, furniture, and the like, characterised by the fact that the woolen or equi particles producing the velvety coating are applied by means of a coarse-fibred web cloth to the surface to be covered, which face has previously been covered with coating of viscous material.

3,795 of 1904.—H. HERZIG: *Sluice Gates.*

A sluice gate, consisting of four or more separate gates which are linked at the bottom end to the beton foundation, and iron at the upper edge of the outer face of each sluice gate, three struts for each part of the sluice gate abutting with their upper ends against said angle iron, shoe the struts, each consisting of an angle fixed to the beton foundation at a suitable distance from the sluice gate, a draw movably arranged on the beton foundation in guide brackets fixed to the same, irons corresponding in number to the struts fixed to the upper surface of the draw and suitable means for moving the draw to and fro from the footpath.

14,036 of 1904.—H. N. COVELL: *Horizontal Engines, and the like.*

This consists in the combination with a driving engine, a swinger gear, consisting of a hand-operated shaft, a swinger drum, and a therefor, a duplex clutch mechanism disposed between said shafts, a clutch mechanism whereby said clutch mechanism shaft is driven from the hoisting engine, a connexion whereby such clutch mechanism controlled from said hand-operated shaft.

16,445 of 1904.—M. HOFHEIMER: *Street Signs.*

This consists in the combination with a having an overhanging light, a sign-mounted on said post and having a plurality of separate signs, and means for reflecting light from the rear through the sign or facing in the direction of the light, the main sign or signs being in unobstructed path of the light rays, which pass directly through them.

SOME RECENT SALES OF PROPERTIES.

ESTATE EXCHANGE REPORT.

September 19.—By J. M. & R. BALLS.
Toppesfield, etc., Essex.—"Mockings Farm," 110 a. r. 22 p., f. yr. 55*l.*

September 20.—By FRITH, GARLAND, & CO. Harringay.—14, Stanhope-gds., f., e.r. 40*l.*

53, Wightman-rd., f., e.r. 40*l.*

Wood Green.—1, Alexandra-ter., n.t. 97 yrs., g.r. 6*l.* 10s. e.r. 30*l.*

By NICHOLAS, DENVER, & CO.

Manor Park.—Rosebery-av., f.g. rents 20*l.*, reversion in 96 yrs.

Ruskin-av., f.g. 8*l.*, reversion in 96 yrs.

East Ham.—Shaftesbury-rd., f.g. 10*l.*, reversion in 96 yrs.

Arrogan-rd., f.g. 8*l.*, reversion in 96 yrs.

Chilton-rd., f.g. 45*l.*, reversion in 93 yrs.

Manor Park.—143 a., f., e.r. 52*l.*

134, Rosebery-av., f., e.r. 26*l.*

East Ham.—30 and 92, Arrogan-rd., f., w.r. 4*l.* 4s.

88 to 94 (even), Parr-rd., f., w.r. 85*l.* 8s.

96, Parr-rd., f., w.r. 26*l.*

94, Arrogan-rd., f., w.r. 22*l.* 2s.

Manor Park.—Church-rd., four freehold building plots

By NIGHTINGALE, PHILLIPS, & PAGE.
 Wood.—1, Albert Villas, u.t. 63 yrs.,
 g.r. 47, 16s. 3d., e.r. 35l. 2300

By EDWARD SIMPSON.
 Ham.—13, Sandrock-rd., u.t. 82 yrs.,
 g.r. 61, 6s., e.r. 36l. 340

By R. CHERE & Co. (at Stratford).
 1—10, Albert-rd., u.t. 990 yrs., g.r.
 1, 16s., e.r. 34l. 320

By PARK—180, 182, and 184, Third-av.,
 w.r. e.r. 16s. 650

September 21.—By H. J. BROMLEY.
 Serwell—150, Wyndham-rd. (s.), f., y.r.
 30l. 400

rd.—83, Blythe Vale, u.t. 61 yrs., g.r. 62,
 e.r. 36l. 325

By PEMBERTON & BANKS.
 1—1, Rush—22, Wharton-rd., u.t. 64
 yrs., g.r. 107, w.r. 93l. 12s. 560

By E. & S. SMITH.
 enwell.—47, Mount Pleasant, area
 1,000 ft., l., y.r. 45l. 915

By GOWELL (s.), f., e.r. 100l. 1,800

ing Town—Scott-st., l.g. rents 56l.,
 reversion in 61 yrs. 1,300

ton—155, Packington-st., u.t. 32 yrs.,
 g.r. 61, 6s., y.r. 50l. 370

By W. LEON & LEE.
 Gaddesden, Herts.—The "Hoo Estate"
 otherwise "Gaddesden Hoo", 400 a.
 r. 7 p., f. and c. 10,850

By HOLLIS & WEBB (at Scarborough).
 borough, Yorks.—Leat Drive, The
 Promenade Pier and Estate, area 1 acre, f.
 500TON, SONS, & BUCKMASTER (at Fulham).
 am.—13 to 27 (odd), Radpole-rd., u.t. 90
 yrs., g.r. 64l., y.r. 318l. 2,990

reversion in 99 yrs. 225

SMALPICE, ALLEN, & Co. (at Bagshot).
 chor, Surrey.—Carriage-rd., two freehold
 villas, c.r. 52l. 450

September 22.—By C. C. & T. MOORE.
 ind.—9, Church-st., f., w.r. 15l. 12s. 120

ing—36 and 38, Turner's-rd., u.t. 60
 yrs., g.r. 92, e.r. 34l. 570

Nicholas-st., u.t. 26 yrs., g.r. 10s., w.r.
 36l. 8s. 220

By SLADE & BUTLER.
 ish Town.—21 and 22, Pierhead-st., u.t.
 19 yrs., g.r. 12l., w.r. 114l. 12s. 575

inery and plant now at the Ramble Mills,
 Staines 1,550

nton.—1 and 3, Hendon-rd., u.t. 92½
 yrs., g.r. 9l., w.r. 44l. 4s. 244

By HATCH & HATCH (at Calford).
 9, Royal Oak-pk., u.t. 83 yrs., g.r.
 114, 10s., p. 110

ham.—48 and 48A, Mount Pleasant-rd.,
 l., y.r. 62l. 14s. 810

By MARK GILBERT.
 ham Abbey, Essex.—The High Bridge-st., the
 King's Arms "p.h. and cottage ad-
 joining, f., y.r. 95l. 2,200

By CHARLES HALL.
 am.—59, The Chase, u.t. 64 yrs., g.r. 12l.,
 w.r. 48l. 400

rd.—12, Chatto-rd., u.t. 79 yrs., g.r.
 5l., e.r. 30l. 280

By RIDER & SONS.
 ing Hill—76 and 78, Bramley-rd., u.t. 62
 yrs., g.r. 12l., w.r. 72l. 16s. 470

Hurstway-st., u.t. 62 yrs., g.r. 6l., w.r.
 33l. 16s. 220

By WAGSTAFF & SONS.
 on.—62, Parkholme-rd., u.t. 31½ yrs., g.r.
 22, 10s., y.r. 34l. 345

and Mayfield-rd., u.t. 33 yrs., g.r. 11l.,
 y.r. 72l. 590

MEETINGS.
 SATURDAY, OCTOBER 1.
 Incorporated British Institute of Certified Carpenters.—
 Monthly Meeting at Carpenters' Hall 6 p.m.
 Northern Architectural Association.—Visit to Council
 Schools, Heaton and St. Gabriels. 3 p.m.

MONDAY, OCTOBER 3.
 Society of Engineers.—Mr. R. G. Allanson-Winn on
 "Deep Sea Erosion and Foreshore Protection."
 7.30 p.m.

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PRICES CURRENT OF MATERIALS.
 * Our aim in this list is to give, as far as possible, the
 average prices of materials, not necessarily the lowest.
 Quality and quantity obviously affect prices—a fact
 which should be remembered by those who make use of this
 information.

BRICKS, &c.

Hard Stocks	1 15	0	per 1000	alongside, in river.
Grizzles	1 13	0	"	"
Facing Stocks	2 12	0	"	"
Shippers	2 10	0	"	"
Pietons	1 10	0	"	at railway depôt.
Red Wire Quins	1 14	0	"	"
Best Farnham Red	3 12	0	"	"
Best Red Pressed Rushon Facing	5 0	0	"	"
Best Blue Pressed Staffordshire	4 4	0	"	"
Do. Bullnose	4 10	0	"	"
Best Stourbridge Fire Bricks	4 8	0	"	"
GLAZED BRICKS.				
Best White and Ivory Glazed				
Stretchers	13	0	"	"
Headers	12	0	"	"
Quoins, Bullnose and Flats	17	0	"	"
Double Stretchers	19	0	"	"
Double Headers	16	0	"	"
One Side and two Ends	19	0	"	"
Two Sides and one End	20	0	"	"
Slays, Cham- fered, Squints	20	0	"	"
Best Dipped Salt Glazed Stretch- ers, and Headers	12	0	"	"
Quoins, Bullnose, and Flats	14	0	"	"
Double Stretchers	15	0	"	"
Double Headers	14	0	"	"
One Side and two Ends	15	0	"	"
Two Sides and one End	15	0	"	"
Slays, Cham- fered, Squints	14	0	"	"
Second Quality White and Dipped Salt Glazed	2	0	"	less than best.
Thames and Pit Sand	7	3	per yard,	delivered.
Thames Ballast	6	0	"	"
Best Portland Cement	30	0	per ton,	"
Best Ground Blue Lime	21	0	"	"
NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.				
Grey Stone Lime	12s. 6d.	per yard,	delivered.	
Stourbridge Fireclay in sacks	27s. 6d.	per ton at	ry. dpt.	
BARU STONE—delivered on road wag- s. d. gons, Paddington Depôt 1 6½ per ft. cube. Do. do. delivered on road waggons, Nine Elms Depôt 1 8½ " "				
PORTLAND STONE (20 ft. average)— Brown Whittled, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf..... 2 1 " " White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf..... 2 2½ " "				
Ancaster in blocks 1 1l per ft. cube, del. rly. depôt. Beer 1 6 " " Greenhill 1 10 " " Darley Dale in blocks 2 4 " " Red Corsehill 2 5 " " Closeburn/Freestone 2 0 " " Red Mansfield 2 4 " "				
York Stone—Robin Hood Quality. Scappled random blocks 2 10 " " 6 in. sawn two sides Landings to sizes (under 40 ft. super.) 2 3 per ft. super. " " 6 in. rubbed two sides ditto, ditto 2 6 " " 3 in. sawn two sides slabs (random sizes) 0 11½ " " 2 in. to 2½ in. sawn one side slabs (random sizes) 0 7½ " " 1½ in. to 2 in. ditto, ditto 0 6 " "				

STONE (continued).
 HARD YORK— s. d.
 Scappled random blocks 3 0 per ft. cube del. rly. depôt.
 5 in. sawn two sides
 Landings to sizes
 (under 40 ft. super.) 2 8 per ft. super. " "
 6 in. rubbed two sides
 ditto 3 0 " "
 3 in. sawn two sides
 (slabs random sizes) 1 2 " "
 2 in. self-faced random
 flags 0 5 " "
 Hopton Wood (Hard Bed) in blocks 2 3 per ft. cnbe.
 del. rly. depôt.
 " " " 6 in. sawn both
 sides landings 2 7 per ft. snper.
 del. rly. depôt.
 " " " 3 in. do. 1 2½ " "

SLATES.

20 x 10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20 x 12 " "	13	7	6	" "
20 x 10 first quality " "	13	0	0	" "
20 x 12 " "	13	15	0	" "
16 x 8 " "	7	5	0	" "
20 x 10 best blue Port- madoc	12	12	6	" "
16 x 8 " "	6	12	6	" "
20 x 10 best Eureka fading green	15	17	6	" "
20 x 12 " "	15	7	6	" "
18 x 10 " "	13	5	0	" "
16 x 8 " "	10	5	0	" "
20 x 10 permanent green	11	12	6	" "
18 x 10 " "	9	12	6	" "
16 x 8 " "	6	12	6	" "

TILES.

Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. " "
Best Broseley tiles	50	0	per 1000 " "
Do. Ornamental tiles	52	6	" "
Hip and Valley tiles	4	0	per doz. " "
Best Rusbon red, brown or brindled do. (Edwards)	5	6	per 1000 " "
Do. Ornamental do	60	0	" "
Hip tiles	4	0	per doz. " "
Valley tiles	3	0	" "
Best Red or Mottled Stafford shire do. (Peakes)	51	9	per 1000 " "
Do. Ornamental do	54	6	" "
Hip tiles	4	1	per doz. " "
Valley tiles	3	8	" "
Best "Rosemary" brand plain tiles	48	0	per 1000 " "
Best Ornamental tiles	50	0	" "
Hip tiles	4	0	per doz. " "
Valley tiles	3	8	" "
Best "Hartshill" brand plain tiles, and faced	50	0	per 1000 " "
Do. pressed	47	6	" "
Do. Ornamental do	50	0	" "
Hip tiles	4	0	per doz. " "
Valley tiles	3	6	" "

WOOD. At per standard.

Deals: best 3 in. by 11 in. and 4 in.	£ s. d.	£ s. d.
by 9 in. and 11 in.	15 10 0	16 10 0
Deals: best 3 by 4	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and	11 10 0	12 10 0
8 in. and 3 in. by 7 in. and 8 in.	0 10 0	less than
Battens: best 2½ by 6 and 3 by 6	7 in. and 8 in.	
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	" 9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	" 9 10 0
Foreign Sawn Boards—		
1 in. and 1½ in. by 7 in.	0 10 0	more than
¾ in.	1 0 0	battens.
		At per load of 50 ft.
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Swedish	4 5 0	4 10 0
Small timber (6 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0
JOINERS' WOOD. At per standard.		
White Sea: first yellow deals,		
3 in. by 11 in.	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by		
11 in.	18 10 0	20 0 0
3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals,		
3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Second yellow deals, 3 in. by		
11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by		
11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	40 0 0	upwards.
Odmonds	28 0 0	" "
Seconds, regular sizes	30 0 0	" "

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 ness matters should be addressed to THE PUBLISHER,
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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Table with 4 columns: Nature of Work, By whom Required, Premiums, and Design. Includes entries for New Public Offices and External Treatment of Building for Tropical Climate.

CONTRACTS.

Large table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tenders, etc., supplied by, and Tender. Contains numerous entries for construction projects across various locations like London, Manchester, and Watford.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be delivered. Lists various construction projects and their respective contractors and tender dates.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Lists public appointments such as Inspectors of Works and Surveyors with their salaries and application dates.

Those marked with an asterisk (*) are advertised in this Number. Competitions, iv. Contracts, iv. vi. viii. x. Public Appointments, xix.

CURRENT.—Continued from page 347.

Large table listing prices for various materials including WOOD, METALS, LEAD, &c., and VARNISHES, &c. Columns include material names, units, and prices in £ s. d.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100£, unless in some exceptional cases and for special reasons.]

† Denotes accepted. † Denotes provisionally accepted.

ABERBARGOED.—For erecting a schoolroom, for the Committee of the Calvinistics of Monmouthshire. Mr. O. Keashole, architect and surveyor, Station-road, Bargoed. Williams & Sons 2888 0 0 Burns, Bargoed * 579 6 8 D. Williams . . . 699 0 0

BARNSELY.—For erecting two houses, etc., in SVAGES-avenue, Osawber-road. Messrs. Crawshaw & Wilkinson, architects, 13, Regent-street, Barnsley.— Mason: J. Taylor, Darley Bank, Barnsley.* Joiner: A. Chambers, Wilby-lane, Barnsley.* Slater: Fleming, Eastgate, Barnsley.* Plumber: F. W. Rogers, Church-street, Barnsley.* Plasterer: J. Shaw, Park-road, Barnsley.* Painter: W. Smith, Sheffield-road, Barnsley.*

DUNSTABLE.—For erecting a new Wesleyan church at Upper Houghton Regis. Mr. Goldhawk, architect, Kingston, Welling, Berts.— D. Parkins . . . £1,597 0 Vale & William F. F. White . . . 1,485 0 son . . . £1,297 0 Ooodechild & Jeffrey . . . 1,476 0 G. Whitman . . . 1,278 0 C. Pitkin & Son . . . 1,448 0 W. Wood . . . 1,250 0 J. Ellwood . . . 1,438 11 A. W. Nash . . . 1,198 0 A. Robinson . . . 1,397 10 C. Ahrabams . . . 1,140 0 A. Atkins . . . 1,370 0 C. W. Right . . . 1,369 0 Mallett & Wood . . . 1,369 0 L. A. n e f o r d . . . 1,369 0 H. Biggs . . . 1,300 0 Biggleswade * 1,100 0

Table listing prices for ENGLISH SHEET GLASS IN CRATES, OILS, &c., and METALS. Columns include material names, units, and prices in £ s. d.

HANDSWORTH.—For making Milestone-lane, for the Urban District Council. Mr. H. Richardson, Engineer and Surveyor, Council House, Handsworth:—
 T. J. Mason £900 Sutherland & Thorpe £336
 S. Wood 350 Fitzmaurice & Co. . . . 323
 Currall, Lewis, & J. White, jun.,
 Martin 340 Handsworth* 304
 G. Law 337

HANDSWORTH.—For laying six miles of storm-water sewers, etc., for the Urban District Council:—
 G. Holloway £8,391 0 0 Johnson & Co. . . . £8,838 0 0
 J. F. Dawson 8,377 0 0 Langley & Co. . . . 6,780 0 0
 G. Law 8,207 6 0 J. White, jun. . . . 6,780 0 0
 Blewitt & Sons 7,992 19 4 Fitzmaurice & Co. . . . 6,720 0 0
 Sutherland & Thorpe 7,460 0 0 E. Boore 6,591 0 0
 Currall, Lewis, & J. White, jun. 8,338 0 0
 Martin 7,384 0 0 W. Jowett 8,231 0 0
 Wilson & Son 6,955 0 0 H. Hart & Co. 5,975 6 11
 Lock, Andrews, & Price 6,918 0 0 T. J. Mason 5,860 0 0
 G. Trentham, Birmingham* 5,732 0 0

HULL.—For alterations to premises, 238, 240, 242, Beverley road, Steppes, Hull, for Mr. F. Bristow. Mr. T. Brownlow Thompson, architect, 15, Parliament-street, Hull. Quantities by architect:—
 J. Wilson £718 0 0 H. T. Arnott £624 0 0
 H. Kaye 694 18 0 J. Sibson & Son 600 0 0
 Marsden & Son 660 0 0 F. Gontes & Son 599 0 0
 Houlton & Son 659 4 0 J. Moore 589 2 8
 Hull General Builders, Ltd. 653 12 0 Amalgamated Builders 578 14 0
 F. Blackburn & Son 649 17 0 C. Bray 578 10 6
 J. H. Carr 649 17 10 M. Harper 569 0 0
 I. Gibson 633 15 0 W. Turner 559 10 0
 J. Thompson & Son 640 0 0 F. Billon, street, Hull* 559 0 0
 F. W. Wilson 833 5 3 1/2

LONDON.—For alterations to Rotherhithe Town Hall, for the Bermondsey Borough Council. Mr. R. J. Angel, Borough Surveyor, Town Hall, Spa-road, S.E. Quantities by Mr. A. F. Wrightson, 23, Budge-row, E.C.:—
 Henry Kent, Lewisham* £997

LONDON.—For restoration of 19 and 23, Cousin-lane, E.C., for the Ceylon, India, & China Tea Co. Mr. Richard Peters, architect and surveyor, 73, Wool-exchange, Coleman-street, E.C.:—
 Candler & Sons* £50

LONDON.—For the erection of a bathroom and alterations to 8, Victoria Park-square, Bethnal-green, for East London Royal Engineer Corps. Mr. Richard Peters, architect and surveyor, 73, Wool-exchange, Coleman-street, E.C.:—
 Ames* £330

LONDON.—For excavating the carriageway of part of Great Church-lane and laying foundations and blocks, for the Hammersmith Borough Council. Mr. H. Male, Borough Surveyor, Town Hall, Hammersmith:—
 Multhead, Greig, & Matthews £2,219 18 0
 Martin, Wells, & Co., Ltd. 1,876 0 0
 J. Mowlem & Co., Ltd. 1,781 0 0
 G. Wimpey & Co. 1,703 6 0
 Harvey Bros. 1,692 5 4
 B. Nowell & Co. 1,620 0 0
 Millars' Karri and Jarrah Co., Ltd. 1,593 4 0
 Acme Flooring and Paving Co., Ltd. 1,575 1 10
 Improved Wood Paving Co., Ltd. 1,567 13 6
 W. Griffiths & Co., Ltd., Bishopsgate street Without, E.C.* 1,560 5 2

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 J. & R. Rawlinson 824 16 4 | J. Rose & Son, Sleaford* 443 1 1
 J. Allison 590 3 2

MOSELEY.—For erecting a house. Mr. E. Stanley Mitton, architect, 11, Ocean-chambers, Waterloo-street, Birmingham. Quantities by Mr. J. Percival Bridgewater, Birmingham:—
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 W. J. Phillips 950

MOUNTAIN ASH.—For erecting seventy-nine houses, for the Brynolwg Cottage Co., Ltd. Mr. T. W. Millar, architect and surveyor, Mountain Ash:—
 J. Davids, Aberavon Steam Saw Mills, Port Talbot £184

TOTTENHAM.—For making additions and alterations to Mr. H. J. Budd's premises, Nos. 2, 4, and 6, West Green-road, South Tottenham. Mr. A. C. Green, architect and surveyor, 111, Fore-street, Edmonton, and 40, Bruce Castle-road, Tottenham, N.:—
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 Pollard & Brand 1,280 | J. Stewart 998
 W. Lawrence & Son 1,184 | J. Groves* 959
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TUNSTALL (Suffolk).—For the pulling down and rebuilding of "The Green Man," for the Hon. W. Lowther. Mr. Chas. V. Cable, architect, The Turret, Hartley, Wintney, Hants:—
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Competition Design for Hull Town Hall	By Mr. John Murray, F.R.I.B.A.
New Offices for the Bristol Gas Company	Mr. W. V. Gough, Architect.
Illustrations of State of Canterbury Tower	From Photographs.

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The Church of Greenstead.



ABOUT a mile to the west of Chipping Ongar, reached by a beautiful walk through meadows flanked on each side by a wide avenue of elm-trees, lies the little church of St. Andrew, Greenstead, which serves for a small parish of less than a hundred inhabitants. Hidden among trees, and at first sight of no particular moment, this diminutive village church may yet fairly lay claim to be in one respects the most interesting in England.

It is upwards of a century and a half since attention was drawn to the singular construction of the nave. Among the MSS. of the British Museum are a collection of original letters on anti-arian subjects, written by Mr. Smart Vieullier, of Aldersbrook, Essex, to Lyttleton, the then president of the Society of Antiquaries. The following is an exact transcript of a letter read from Aldersbrook on January 21, 1712 (Stowe MSS. 752, f. 49):—
In obedience to your command I give you the best account I can collect concerning our very singular parish church at Greensted, juxta Ongar, in this county.

What is now the body of the church is the whole of the original fabric. It is 29 ft. 9 in. long and 14 ft. wide. The sides from the present ground

without, only 5 ft. 6 in. high, on which the primitive roof depended, but whether of that or of other materials, we have nothing to determine by. This structure is entirely composed of the bodies of oak-trees split and roughly hewn on both sides. They were sett upright close to one another and lett into a sill at bottom and a plate at top, where they are fasten'd with wooden pins all in a very rough manner at first, and now much corroded and worn with age.

"There appears one little contrivance of art in ye building, viz., that the edge of one tree is made to slip a little within its neighbour, doubtless to prevent the wind from blowing thro, but upon the whole I think an ax, a chizel, a mallet, and an augre were tools sufficient to compleat the fabrick.
"It was no small pleasure to me to meet with a passage quoted from an ancient MS., which in some measure I think determines the time and occasion of erecting this uncommon fabrick.

"Leland and the compilers of the Monasticon have extracted a passage from a register once belonging to the Abbey of St. Edmunds Bury in Suffolk, wherein it is recorded that the body of St. Edmund the King and Martyr, heing on its way from London to Bury, was lodg'd one night at Stapleford in Essex, when the Ld of the manor was by its presence miraculously cured of an infirmity he had long labour'd under; and then says the register—*Idem apud Aungre hospitabatur ubi in ejus memoria lignea capella permanet hodie.* 'Tis no wonder that the monk who drew up this register

should mistake Aungre for Greensted in his placing this chapel, since they are hardly a mile asunder; but it is evident that the present road thro Ongar is a much later one, since it cuts thro the outward fortifications of the castle, which was built there in Henry ye 2nd's time. And we have both tradition and visible remains that the antient road from London into Suffolk ran thro Oldford, Abridge, Stapleford, Greensted (perhaps Green Street), Dunmowe, and Clare upon the borders of the two counties.

"The forementioned Translation of the body of St. Edmund appears to have been in the year 1013. For the Danish fleet under Turkill, having committed great ravages in most parts of England, Ailwinus bishop of Elmham in ye year 1010, the 30th of King Ethelred, caused the holy body to be transported to London for safety against those ravagers, and peace heing soon after bought, the body was three years after recarried to Bury.

"From all which I think we may reasonably conjecture that this wooden fabrick was at that time erected on purpose to receive the holy body, and having been once so honour'd was preserved with veneration and converted into a parish church with the addition of a small chancel in much later ages.

"Perhaps here is better authority for the history of this piece of antiquity than we have for any other of so remote an age, and of no more considerable import in its original; I look upon it as a thing done in haste for a particular



Greenstead Church: before Restoration of 1845-9. (From an old drawing.)

occasion, and not as any model for the style of the age it was erected in. I fear I have been tedious, but as you seem to esteem it a curious piece of antiquity I was willing to set it in as clear a light as I was able."

Mr. Letheuillier forwarded some drawings of the church to Dr. Lyttleton with his letter, and the Society of Antiquaries considered them to be of sufficient importance to be figured in *Vetusta Monumenta* (vol. ii., pl. 7). On that plate is given a general south view of the church drawn in 1748, of the timber wall of the north side, and of the timbers of the west end of the church. A single dormer window, of four lights, is shown in the roof of the nave on the south side. There is a clumsily-made plain wooden porch on the same side. The priests' door, of moulded brick, with a window each side, appears in the chancel. A vacant space between the logs for a north doorway to the nave is also shown, though apparently plastered up. But the most interesting feature of these drawings is that of "the west end of the church." It is an exterior view of the west gable, formed of seventeen split logs with their rounded surfaces outwards, rising in the centre to a considerable height. The date and construction of this gable is evidently coeval with the side walls. A very small doorway is shown as roughly cut through parts of the two centre logs. This drawing could not have been an invention, and is clearly intended to show the condition of the west end before the tower was added, and which must then have remained with the tower simply built up against it. This very small doorway seems at that time to have been the only entrance into the tower. The west end remained, we suppose, in this primitive condition until the restoration of 1848-9.

From two drawings of this church of a later date, but prior to the restoration, we know that there were also two dormer windows to the nave on the north side.

There is a much-condensed abstract of the just cited letter of Mr. Letheuillier on the plate in the *Vetusta Monumenta*. His discovery of the interest pertaining to this fabric and his account and

drawings of the building are of much value. There is not the least reason to doubt the correctness of his assumption that this is the very building that gave shelter to the body of St. Edmund on its return from London to Bury St. Edmund's in 1013, and that the old primitive building was subsequently retained unaltered in consequence of the honour that had been thus done to it. But where Mr. Letheuillier, followed by other antiquaries, is almost certainly wrong is in the suggestion that this wooden shelter was run up hastily for the mere purpose of affording a night's lodging for the much-venerated body of the saint. Against such a surmise there are several strong arguments. In the first instance, the words cited from the old register do not bear out this idea; the natural translation of the terms used implies that the wooden chapel remained or was preserved because of the use to which it had been put, and that there was a wooden consecrated chapel on the site when the body arrived. The notice of the approach of the body could have been but very brief, and the timber building with south and north doorways shows no sign whatever of hasty erection. Had the building been subsequently consecrated because of sheltering the body, surely it would have been dedicated to St. Edmund, and not (as is the case) to St. Andrew. Moreover, the old part of the fabric is not the least what might be expected in the XIth century, but rather pertains to a period earlier by one or two centuries. By the beginning of the XIth century churches of stone were certainly the rule and not the exception. Bede tells us that when Finan first erected his celebrated missionary church at Lindisfarne in 652 the bishop was content with one which was not built of stone, but, after the Scottish fashion, composed of cleft oak thatched with reeds (*More Scottorum de robore secto totum composuit atque harundine texit*). The term "cleft oak" is singularly appropriate to the nave of Greenstead church.

It has recently been shown in the columns of the *Builder* that the closely-adjacent market-town of Chipping Ongar

bad almost certainly its church of stone at the date of St. Edmund's translation. Why then, it may be asked, was not the venerated body lodged for the night within the consecrated stone walls of a more dignified sanctuary? The answer is a fairly obvious and interesting one: because parts of the country were still in an unsettled state. Those making this solemn journey would naturally be somewhat nervous as to being entrusted with their precious charge, and would therefore prefer the shelter of a retired forest-screene, old wooden chapel to that of the church so prominently situated in the midst of a little town.

In the "Memorials of Essex," by R. A. Suckling, published in 1845, a careful account is given of this church, accompanied by a lithographed plate of the north side, and by another plate bearing a ground plan (inaccurate), a portion of the timbers on the south side, and other details. Shortly after this volume was issued the chancel was restored, and that was soon followed by the restoration of the oldest part of the fabric. Beneath the tower, against the north wall, is a board incised with the following inscription:—

"The chancel of this church was restored 1845, the nave 1848-9.

PHILIP W. RAY, Rector.
WM. SMITH, } Churchwardens.
JOSEPH KENSLEY, }
T. H. WYATT, Architect.
J. BARLOW, Builder."

Whilst the latter work was in progress the matter was more than once referred to in our columns; and on its completion a south view of the restored church appeared in this paper, which was afterwards reproduced in the *Gentleman's Magazine* for June, 1849.

At the time of the restoration of the nave poorly-selected deal was unfortunately used for the new roof. About forty years after its erection the roof showed such obvious signs of decay that its reconstruction soon became a necessity. An oak roof on an improper plan was substituted in 1894, under the superintendence of Mr. F. Chancel. At the same time a brick buttress was wisely removed from the north side of the nave, exposing the sound timber behind it.

After the restoration of 1848-9 the rector (Rev. P. W. Ray) published a booklet on this church, which ran through three editions. It was illustrated with two poor plates of the south side before and after restoration, and by a useful plate giving a transverse section of the logs with the uniting tongue of wood, and also a side view of one of the logs showing the groove for the tongue.

In a good article on the timber of Essex churches which appeared in the *Essex Archaeological Journal* for 1891 (vol. iv., old series) a north view of the church is given.

Before entering on the brief consideration of the present condition of the church and of the timber walls of the nave it will be best to give further particulars of its vigorous restoration in 1848-9. The *Builder* of those days commented on the severity of the treatment, and brought a letter from Mr. Barlow Ongar, the builder, which appeared on January 27, 1849. He there states that the principal cause of the walls being

ken down was that "the oak sills, having been laid on the earth with merely some rough flint put under them at intervals, had become so rotten to let the upright timbers drop through, and, had not the ends of the wall-plates rested on the brickwork of the chancel, the great part of the nave must have fallen." He added that it was the wish of the restorator and architect that every possible part of the old timbers should be preserved; that the only parts lost were about 1 in. cut from the lower ends; and that the timbers had been fresh tenoned and inserted in oak sills laid on brickwork 1 in. from the ground. He further stated that the planks when cut were found to be "so hard as almost to defy the saw." The scheme also involved the taking off the plaster from the interior, so that the inner sides of the somewhat roughly-hewn logs were left exposed. Other facts in connection with the restoration are made clear by further notice in the *Builder* and by the restorator's little book. The cleft logs, or trunks, forming the walls, numbered twenty-five on the north side and twenty-five on the south. The rounded side of the trunks was placed outwards. Those on the north side were the least decayed, requiring only about an inch of rotten wood to be removed, whilst those on the south had about 5 in. taken away. The uprights were tenoned into the sills and wall-plates in grooves about 1½ in. deep, and fastened with wooden pins. The uprights were found to be tongued together at the junction with oak strips, which had proved to be a most effectual preservative against wet; for, although the interior was plastered, there was no evidence anywhere of moisture having found its way through the junction of the uprights. In the reconstruction of these walls the old plan was faithfully adhered to, the only alteration being that the red inner walls show narrow strips

of oak fastened on at the joinings of the uprights.

The curved outsides of the trunks were left exactly as they were found when the restoration began, save that one or two were wholly renewed and one was patched. At first sight, these outsides, then as now, present the appearance of having retained their bark; but a closer examination shows that the ten or twelve centuries of exposure to the weather has furrowed them, to the depth of from half an inch to an inch, into long, irregular ridges, through the decay of the softer parts of the surface wood.

There seems little doubt that the reconstruction of the old timber side walls was absolutely imperative at the time when it was undertaken, and that the work was on the whole executed on sound and careful lines. But one unhappy blunder was made. There was apparently no necessity for taking down the gabled west end, made (like the sides) of split trunks; even if it was so, it should have been re-erected on the old lines. Instead of this, the greater part of the centre lofty timbers were cleared away so as to leave a great doorway or quasi-arch into the western tower. We suppose this was done to make the base of the tower easily available as a vestry, which could scarcely have been the case when it was only entered by the very small doorway cut out of two of the logs, as has been already mentioned; but the destruction of so much of the most characteristic part of this ancient and unique fabric was a heavy price to pay for a few feet of vestry room.

A new open timber work porch was provided on the south side; its predecessor was pronounced "modern." The south doorway, of just the same dimensions as before, is 4 ft. 7 in. wide, including the jamb-posts. Nearly opposite, but

a little nearer the west, is the north doorway, which is only 2 ft. 5 in. wide. It had been plastered up, but the opening was then filled with three new logs. It may here be mentioned that singularly bad choice was made of the few new logs or trunks required in 1848-9. If the three that fill up the north doorway are examined, they will be found to be already peppered with wormholes, and the grubs have obviously strayed from the softer new wood to the much harder adjacent old timber. Again, upright number five from the west end, on the north side, has been mended with a small new piece rather clumsily nailed on, and this piece is simply freckled over with wormholes, and is a dangerous source of infection to the rest. The whole of the logs, inside and out, most urgently require attention to check further worm ravages. They can be checked effectually with a comparatively small expenditure of money and care: The application of equal parts of benzene and linseed oil is usually successful. This work ought to be promptly undertaken. Having paid visits to this church in the autumn of 1903 and again in June and September, 1904, and having made diagrams of the number of wormholes in certain places on the north side, we are able to state that the progress of decay is now rapid.

The uprights vary much in size; the largest on the north side has a width of 16 in. and the narrowest only 7 in.; on the south side the widest is 17 in. and the narrowest 8½ in. The exterior measurement on the south side is 29 ft. 10 in. and on the north side 29 ft. 7 in. The interior width is 14 ft. 6 in. In one of the uprights just west of the north doorway a small pointed niche has been hollowed out, 11 in. high by 7 in. in width; this has doubtless served to hold a small holy-water stoup in the old days.



Greenstead Church: from South-east.



Greenstead Church: North Side.

The foolish idea, at one time so commonly held, and now again repeated in guide-books and directories of the present day, that this old timber work is chestnut and not oak, had, perhaps, better be once for all combated. Mr. Lethuillier, Mr. Suckling, Professor Boulger (of the Essex Field Club), a deputation of the Linnean Society (who specially visited the church during restoration), and many other experts pronounce the timber to be certainly oak. This notion of a certain class of old oak being chestnut had at one time a strong hold upon the popular imagination, and though always exploded on investigation, seems as difficult to uproot as "leper" lowside windows or crusading cross-legged effigies. About a score of old buildings in England have shared with Greenstead in this fond imagining; the most noted cases being the roofs of Westminster Hall and of the refectory of Westminster Abbey. With regard to this belief that the roof beams and other timber of certain ancient buildings were of sweet chestnut wood, it must suffice here to cite some of the exact words of Selby in his "British Forest Trees":—

"The examination and the repeated experiments that of late years have been made upon this wood have satisfactorily proved that, in all such instances, the timber of the oak, and chiefly of the sessile-fruited kind, have been mistaken for chestnut. The fact is, as Buffon first observed, the wood of the oak, more particularly of the sessile-fruited variety, assumes, in course of time, a near resemblance in colour to that of the chestnut in its best condition or when young and untainted at heart; and, as few chestnuts could have acquired the scantling frequently observed in the timber of these ancient buildings at the age of decay almost invariably commences, this, in itself, furnishes a strong argument against the use of chestnut timbers and beams by our ancestors, inasmuch as the trees must have become unfit for the purpose long before they had attained the necessary dimensions."

When originally erected, this cleverly-built kind of a log-hut was complete in itself, and probably received a mere modicum of light from a window or windows in the east end; but the east end has long ago disappeared. It is usually stated that the chancel dates from the time of Henry VII., but a careful examination shows that there was a chancel built out at the east end

of the wooden church at a far earlier date. There are patches of untrimmed flint work in the south wall of the chancel for about 2 ft. above the ground; a little of the same rough material shows at the east end; whilst on the north side there are fully 3 ft. of the same composition. The style of this kind of rubble work, with an abundance of mortar, particularly if compared with various other examples in Essex churches, points clearly to Norman days. As this district revived soon after the Norman conquest, there would come about a desire, even in this small place, for greater accommodation, and especially for greater altar space. Hence the throwing out of a chancel at the east end of a church, which the feeling of reverence for St. Edmund among the older and Saxon inhabitants would not permit to be otherwise molested. This Norman chancel sufficed up to the latter part of the XVth century, when it was rebuilt on the old foundations in the brickwork that was then beginning to be popularised as a material for church extension and improvement in various parts of Essex. The priests' doorway on the south side, of moulded brick, is a good example of about Henry VII.'s time, and the recessed window on the west of this doorway is of the same date. In 1845 this chancel was restored and a great deal of new brickwork introduced. It is quite easy to distinguish the bricks of the XVth century from those of the XIXth, which are here mingled together in the same walls. The older bricks measure $8\frac{1}{2}$ in. long by 2 in. broad, whilst the modern ones are 9 in. long by $2\frac{1}{2}$ in. broad. When the chancel was restored it must have been done somewhat heedlessly; an interesting and unusual shaft piscina, described and figured by Mr. Suckling, which used to stand in the south-east angle, disappeared.

The tower and spire at the west end are sometimes spoken of as if they were almost entirely modern, but this is a complete mistake. A study of the older timbers shows that it is a plain example of XVth century date. It is rather singular that the tower was not applied to the centre of the old log-hut gable

end. It is about 12 ft. and a few inches square, and was placed nearly flush with the south wall, so that there is no space to the north of it where part of the old rebuilt gable end, with six gradual logs, still remains. The octagon broach spire is covered with shingles. In the tower there used to swing two bells, when it was visited by Edward IV. commissioners for the seizing of church goods on September 27 in the sixth year of his reign, they found "ij great bells weight cccli. and di." They took with them a variety of vestments, ornaments, and other church goods, but left for the use of the minister a silver chalice, a surplice, and a black satin cope.

In the north-east angle of the tower stands a good panelled oak pulpit of hexagonal shape. On the centre panel facing west is the date 1698 and the monogram "I.H.S." let in in dark coloured wood; the base is new.

The chancel is entered by a new Tudor archway. Against the north wall is a mural tablet of alabaster in a well-designed border. The inscription is—

"Here lieth Jane, sister to Thomas Smit Mont, Knight, second wife of Alan Wood Snodland in Kent, Gent, who livinge vertuous 66 yeeres died godly the xx of August 1585."

"Feare thou God and doe
As thou wouldest be done unto."

On the same side of the chancel is a tablet to William Hamilton Warren, thirty-one years rector, who died in 1845.

Against the opposite wall of the chancel is another mural tablet, to the memory of Richard Hewyt, a native of Essex, another rector of Greenstead, who died in 1724. The inscription, as given by Suckling, is of exceptional interest, and refers to his father's faithfulness to Charles II. when in exile. The inscription is now almost wholly illegible; it would be a pious work to revive it.

In the churchyard, on the south side close to the nave wall, is a large, fine stone coffin-cover or sepulchral slab with a slightly-raised line running down the centre. It is 6 ft. 3 in. long and tapers from 26 in. to 15 in.; it is probably of XIIIth century date. We believe it was moved here from out of the chancel at the time of its restoration in 1845.

The four windows of the chancel are filled with stained glass to the memory of William Smith, twenty-five years churchwarden of this parish; he died in 1871. The small north window has an effigy of St. Edmund, with the incident of his being shot to death pictured below. The border is filled with crowned E's.

Beneath the tower, affixed to the north wall, is a well-painted wooden panel of St. Edmund pierced with arrows. It measures, without the frame, 24 in. by 10½ in. The costume of the bowman in the background shows that it is of late XVth or early XVIth century date; it seems to be of Flemish design. The panel was for some time kept at the rectory; it is well worthy of a better position in the church than against the dark wall under the tower.

In the British Museum is a private printed book called "Yearly Records of Pyrigo Park, Haveringe-atte-Bower, Essex from 946 to 1888. Extracted and compiled by Montagu Browne." Amongst the notes on churches of this part of Essex

urs the following note (p. 152) as to
instead:—

The rood-screen is well-preserved XVth
ary work, and contains a representation of
Edmund's martyrdom."

Possibly this entry may be a careless
take, for the rest of the church notes
this book have several blunders.
There ever was a rood-screen in this
rch in comparatively modern times,
must have disappeared before Mr.
king's account of "Greenstead was
ned in the "forties." There is this
be said in favour of Mr. Montagu
wne's statement, namely, that the
ited panel is about the size and shape
ne that might well have formed part
he lower panels of a screen for a small
rch. If such a screen had been
troyed in some "churchwarden
utifying," this particular panel might
have been saved from destruction
some pious parishioner.

It may interest some to know that the
sters of this parish, from 1561 to 1812,
et privately printed by Mr. F. A.
p in 1892; a copy can be seen at
British Museum. They contain, how-
ever, no entry in any way relating to the
ic of the church.

NOTES.

A SUGGESTION recently made
by Professor Forbes is that
the construction of a dam at
third cataract would entirely obviate
necessity for raising the Assuan dam,
would thereby save the temples of
e from further submersion. The
is an attractive one, but even
ming its practicability, we have
l reasons for thinking it will not
mend itself to Lord Cromer and Sir
iam Garstin, upon whom now vir-
tly devolves the responsibility of
ding the details of the forthcoming
ation programme. In the first place,
may point out that it was long ago
led by the Public Works Department
imperative reasons exist for the
olishment of a single reservoir of
le capacity at the threshold of Egypt
er, and the hastily-formed opinion
of so distinguished an engineer as
essor Forbes will scarcely suffice to
ge the deliberate policy of engineers
have made Egyptian irrigation the
ect of special study for many years.
Just not be forgotten that the third
ract is some 420 miles south of
an, a distance involving considerable
oration of precious summer water,
requiring about twenty-three days
the passage of water to the point
e it is first required. Therefore the
ion of storage in reservoirs so widely
rated would be undesirable, and
d not secure for Egypt the condition
ved to be absolutely necessary—that
to have near at hand, at the point
e the Nile enters Egypt, a reserve
ter to meet any contingencies which
t arise." Moreover, the loss by
oration in the two reservoirs would
early double that in the deepened
voir at Assuan, owing to duplica-
ion of the exposed surface. Finally,
ave the financial side of the question.
cost of a new dam would probably
ed 2,500,000*l.*, whereas the Assuan
can be raised for about 500,000*l.*

a difference of at least 2,000,000*l.*,
to say nothing of the heavy annual
charges entailed by the necessity for a
second staff of officials at the new dam,
which the Egyptian Government could
not be expected to authorise for the realisa-
tion of a project that is not in accordance
with the views of its expert advisers.

The
Simplon
Tunnel.

At various times during the
construction of the Simplon
Tunnel work has been re-
tarded by the influx of water from under-
ground springs. In the autumn of 1901
a stream of water burst into the Italian
workings, and, attaining a discharge
of nearly 8,000 gallons per minute,
speedily converted the two headings into
canals. Several months elapsed before
the flow could be overcome, and no
sooner had this been effected than a
tremendous fall of rock took place.
Timber struts and shores, of 20 in.
diameter, were repeatedly broken like
tinder, and the boring machinery had
to be dismantled on three successive
occasions. Finally the unstable rock
was held up by means of heavy steel
frames placed at intervals of from 1 to
3 ft. apart. The experience of the
Italians has been unfortunate through-
out, for they have had to deal with
floodings, rock slips, high temperatures,
and exceedingly hard strata. It now
appears that the turn of the Swiss
engineers has come, as only last week
a spring of boiling water was tapped, with
a discharge estimated at 18,000 gallons
per minute. This new influx has resulted,
unhappily, in serious loss of life, and, in
the opinion of a Swiss engineer who
has investigated the condition of the
workings, it is open to question whether
the tunnel will ever be completed. At
the present time we cannot accept this
report as final, but it is undoubtedly
most difficult to deal with a formidable
spring of hot water in space so confined
as that offered by the headings of the
tunnel. As about 10 miles, out of the
total length of 12 miles 458 yards, have
already been driven, it would be singu-
larly unfortunate if the final abandon-
ment of the work were to become neces-
sary. We still hope that the indomitable
energy and great resources of the
engineers, which have served to over-
come so many difficulties in the past,
may once more triumph over adverse cir-
cumstances.

The Third-
Rail System
of Traction.

THE fatal accident to a
soldier who endeavoured to
cross the line of the Liver-
pool and Southport Electric Railway last
week, taken in conjunction with the
recent fatalities on the Lancashire and
Yorkshire and the North-Eastern Rail-
ways, raises the question of whether
the third-rail system of electric traction
is the proper one to adopt on railways.
An unguarded third rail must always
be a source of danger not only to tres-
passers, but also to guards and porters.
The anxiety caused by fear of coming
in contact with the rail will make them
less careful in looking out for approach-
ing trains, and so may also cause
accidents indirectly. Where electric
traction is adopted the trains are gener-
ally reduced in weight and run much
more frequently, and thus the permanent-

way men will have to keep a sharper
lookout for trains, and at the same
time be careful never to touch the rail.
In some lines in America the third rail
is protected by having pine planks
fixed over it, and this not only protects
the officials, but also is of great use in
snowy weather. In this country, how-
ever, the permanent-way men apparently
prefer working on the line with the third
rail entirely unguarded, as they can
make the necessary repairs much more
quickly in this case. It seems to us that
the third-rail method of traction has
this inherent objection—that if you leave
the third rail unguarded the line is
dangerous to porters, etc.; and if you
guard it effectively, then the permanent-
way men are in danger owing to the
limited time at their disposal in order
to make necessary repairs. In our
opinion, the best method will be one in
which the trains get their current from
a trolley wire supported at the side of
the line, so that repairs can be made to
the electric part of the system without
interrupting the traffic and without
undue haste. The permanent-way men
in this case have only to look out for
approaching trains, and there need be
no fear of the traffic being interrupted
by one of them dropping a spanner
or a pick on a "live" rail. With this
system, which is widely used on the
Continent, very high alternating pres-
sures can be safely used. It may be
used also in conjunction with a 600-volt
direct-current third-rail system, such as
will be used by the Underground Electric
Railways Company of London. The
British Thomson-Houston and the
British Westinghouse Company are both
prepared to supply "series" motors
which will operate equally well either
with low-pressure direct current or high-
pressure alternating. The overhead wires
required for this kind of railway will
be quite different from those used with
trams.

Processional-
road
and the Mall.

A REFERENCE to the plan
and two views published in
our number of November 2,
1901, will show how Mr. Aston Webb's
approved designs provide for a rearrange-
ment of the railings and their gate-
entrances which enclose the fore-court
of Buckingham Palace. The designs
embrace the abolition of the middle gates
and the substitution of two gateways,
one on either side of the Queen Victoria
Memorial. The two side gateways will
give access from the Palace to the new
"Queen's-garden" and to the Pro-
cessional-road beyond, as well as to the
two new roads from the "Queen's
garden" which communicate with Green
and St. James's Parks, Constitution
Hill, Birdcage Walk, and Buckingham
Palace-road. The alteration involves a
removal, which is now nearly completed,
of the stone piers and railings and their
reconstruction a short distance north-
eastwards into alignment with the south-
west side of the Memorial. Thus will
disappear what has hitherto been known
as the Sovereign's-gate, whilst the
two new gateways will be fitted with
the gates from the Secretaries'-gateway
and a copy which is being made of them.
When, in 1847, Blore enclosed with a
fourth block the quadrangle of the Palace

as completed by Nash in July, 1837, the fore-court was enlarged on that side and enclosed with piers and railings designed by Decimus Burton, the sculpture being by John Thomas. Three years subsequently Nash's Marble Arch, erected in 1825-7 on the ground now converted as Queen's-garden, was removed to Cumberland-gate, Hyde Park.

**The Bridge,
Kingston-on-
Thames.**

It appears that the bridge is to be rebuilt, or at any rate reconstructed, in connexion with a project for running tramway-cars from Hampton Wick to Kingston market-place, and thence by the Surbiton-road to Ewell and Epsom. A wooden bridge at Kingston is cited in a close Roll of 7th Henry III., and, London Bridge excepted, it was the most ancient across the Thames. In 1607 a severe frost broke the wooden bridge, which Aubrey says had a length of 168 yds. Old charters and other records testify that from Queen Elizabeth's time, at least, until 1828 the bridge was toll-free. An Act having been obtained in 1825, the first stone of the existing structure was laid by Lord Liverpool on November 7 of that year, and on July 17, 1828, the bridge was opened by the Duchess of Clarence, afterwards Queen Adelaide. The Exchequer Bill Loan Commissioners, to whom the trustees applied for a loan of 45,000*l.*, referred the plans, specifications, etc., prepared by Edward Lapidge, County Surveyor, to Telford, their Engineer, who made a favourable report; but, since the Act limited to 40,000*l.* the sum to be raised, Lapidge modified his plans accordingly. About that sum was expended upon the entire works, with the approaches, the bridge itself costing 26,800*l.* Constructed chiefly of brick, with ashlar of Portland stone, it consists of five elliptical arches; the middle arch has a span of 60 ft., with a versed sine of 19 ft.; the two arches on either side have spans of 56 ft. and 52 ft. and rise 18 ft. 3 in. and 16 ft. 6 in. respectively. The foundations were laid upon the substratum of blue clay which lies under all the river-bed at that spot. The bridge is 382 ft. long between the extremes of the abutments, and is 25 ft. wide between the balustrades. The gradient-rate of either incline is 1 in 40; the ratio of the piers to the span of the arches is about 1 to 6. The abutments are terminated with low towers or bastions; a cornice and balustrade, with the recesses or refuge-places that project over the piers, give bold relief to the general elevation. The lowest summer level of the stream falls to about 6 ft. below the springing line of the arches. Official reports made some years ago show that the control of the fabric was vested in a trust whose estate comprises various gifts connected with the revenues of the Corporation of Kingston; and the trustees, as lords of the manor, own the river's banks in the town, some of the aits, two-thirds of the bridge-wharf revenues, and gifts made for repair of the bridge, the rental of about 2,500*l.* being managed by two bridge-wardens. The average annual payment on account of the original loan has been between 700*l.* and 800*l.*; the bridge is now free from tolls. Lapidge

exhibited a view of the bridge at the Royal Academy rooms in 1828. The Act we mention above is 6 Geo. IV., c. 125; the heavy cost of the shore works for the bridge was due to the taking of a fresh site a short distance up-stream from that of the old bridge.

**Progress of
the Steam
Turbine.**

A FEW years ago the turbine, which in principle is the oldest form of the steam engine, was looked upon as a type of prime mover that could never come into general use, owing to its excessive steam consumption. Thanks to the indefatigable labours of Mr. Parsons, and of those who have followed in his footsteps, the efficiency of the turbine has been made to surpass that of the reciprocating engine, and in almost every department of engineering the new type of motor now finds extensive application. In marine engineering, as our readers already know, the turbine has been adopted with most satisfactory results, and it may be noted that the new turbine steamer *Manxman*, built by Messrs. Vickers, Sons, and Maxim for the Midland Railway Company, has established a record for turbine-driven merchant vessels during her recent official trials, as regards both speed and fuel consumption. Electrical engineers throughout the world are busily occupied in the construction of turbines for the equipment of generating stations, and mechanical engineers are devoting increased attention to the design and perfection of new varieties of the engine itself. A striking instance of the importance attached to the new branch of industry thus created is to be found in the announcement made this week by a firm specially identified with reciprocating engines that in consequence of unprofitable business the directors have decided to open up new branches of trade, one of the most noteworthy being the manufacture of steam turbines. That this company, holding the premier position in connexion with a certain form of steam engine, should thus be driven to the manufacture of a rival motor is indeed a triumph for the turbine.

**Electricity in
Building
Operations.**

ACCORDING to the *Electrician* of last week, the erection of the new Home Office buildings in Westminster furnishes us with an object lesson of the relative advantages of steam and electric driving in building operations. We are told that steam and electric mortar pans are both being employed in doing practically identical work. Taking a week of fifty hours as a basis of comparison, it is said that the cost of the steam-driven pan is 2*l.* for coal and 2*l.* for labour, while the total costs of the electrically-driven pan does not exceed 25*s.* under the worst conditions. The large difference in the cost of the coal and the cost of the electricity must be mainly due to the fact that the electric motor is always ready to work. With steam, on the other hand, a large amount of coal has to be expended in raising it to the required pressure before operations can begin. A steam engine requires the constant attention of a driver, whilst a good electric motor can be operated by anyone by simply moving a switch. It is calculated that the

adoption of electricity in working cranes, etc., used in erecting this build has resulted in a saving of about 100*l.* week. In our opinion, when electric energy can be had from public mains the neighbourhood of the building at a moderate rate, then electric driving is more economical than steam driving. Incidentally, electric driving has an advantage in the matter of cleanliness and the operation of lowering heavy weights very slowly can be done with greater nicety. It has to be remembered, however, that electric motors should be put up by a competent electrician in the first place, as great care has to be taken even with the so-called "enclosed motor" to protect them from dust.

**The
Motor
Omnibus.**

LAST week the "trial" of a new motor omnibus heralded throughout the daily Press with a degree of innocent enthusiasm almost equal to that which might appropriately be excited by the practical consummation of some great and novel invention. What the public were expected to believe was "an interesting experiment to test the capability of motor omnibuses" was merely a demonstration in our backward metropolis of a fact thoroughly recognised in large provincial cities like Birmingham, where the advantage and practicability of the motor omnibus are perfectly familiar to all who use the public streets. The "trial" was no trial, and the "experiment" no experiment. Foreigners who visit our capital with sluggish conservatism in many respects must convey a very unflattering picture of national enterprise, while to provincials the same characteristic is a perfect laughing-stock. But in addition to the plethora of London, regarded as an entity, we fear there is some feeling of superiority, perhaps due to the enormous dimensions of the place, given rise to the idea that things successful in little towns, like Glasgow, Liverpool, Manchester, and Birmingham, might break down under the responsibility and excitement attending their introduction to so important a city as the capital of the British Empire. However this may be, we are glad to learn that the antiquated horse-drawn omnibus is at last approaching its inevitable end.

**Sanitary
Condition of
Whitehaven.**

In July, 1902, Dr. B. Strode reported to the Local Government Board upon an outbreak of enteric fever in the Borough of Whitehaven, and upon the sanitary administration of the Town Council. Dr. Farrar has now been instructed to report on the progress since Dr. B. Strode's inspection. In respect to the water supply, he reports that the Council have now a lake works inspector who resides at the lake side, and submits the Borough Engineer and Surveyor's weekly report upon the height of water in the lake, the condition of the gauging the rainfall, and other matters. He also inspects and reports any nuisance which may occasionally arise in the vicinity of the lake. In regard to hot drainage, it is admitted that in many cases drains pass under the houses, and the local committee maintain that in

ld-constructed town like Whitehaven is impossible to avoid this. Whenever defect arises in a house, the Council cause any drain which passes under it to be embedded in concrete and properly ventilated. There still remain, however, a large number of dwellings in which the water-closets are in altogether improper situations (e.g., unventilated closets in cellars, opening directly into living rooms), and Dr. Farrar found several cases of tenements, the occupants of which could only reach their water-closet by going out into the street and round two corners into an adjoining court. The Town Council have, however, displayed considerable activity in remedying some of the more gross sanitary defects in courts and alleys by additional water-closets and improved ventilation and lighting; but, as many of the court houses consist of back-to-back tenements utterly devoid of thorough ventilation, the problem of ventilation cannot be considered to have been solved. Several courts have been provided with electric light, but far too many are still left in darkness. Dr. Farrar estimates that there are at least from 120 to 200 houses, mostly in back-to-back blocks, and in every case without thorough ventilation or proper lighting, which ought to be demolished, not only as insanitary in themselves but as obstructive dwellings.

A CORRESPONDENT draws our attention to the terms of an advertisement by the Borough Council of Paddington which is appeared in our column, in which the Council ask for applications for an appointment as draughtsman in their surveyor's office. The candidate is required not only to be a "neat draughtsman," but to be "experienced in sewerage and drainage works, the examination plans, designs of works of construction including those of iron and steel," and not to employ himself (even out of his spare time apparently) in any other work whatsoever without the express permission in each case by a resolution of the Council. The terms of the requirements would almost imply that it was a surveyor that the Council wished to engage, rather than a draughtsman; and to a person with these various and very important acquirements they offer the salary of 120*l.* a year! Whether the condition of supply and demand in the surveyor's profession is such that there are men with these requirements who would be tempted by such a salary we do not know; but the contrast between the requirements and the salary offered is, at all events, not very creditable to the perceptions of the Paddington Council. They have only 120*l.* to spare for an assistant in their Surveyor's office, they might at least have confined their demands to something more in keeping with the salary offered.

Changes at Finsbury-square. An imposing mass of buildings is in course of being erected at the west corner of the north side of the square, with an extended return front along the City-road. The premises are being built by Messrs. E. Lawrence and Sons, contractors, after Mr. Belcher's plan and designs, for the

life assurance offices of the Royal London Friendly Society, and, we are informed, constitute the first portion of a scheme for rebuilding most of that side of the square as the leasehold interests in the adjoining property gradually expire. A similar change will also be carried out along the south side of the square, where No. 50, at the corner of Finsbury-pavement, has been rebuilt by Messrs. J. Greenwood and Co., contractors, after designs by Messrs. Gilbert and Constanduros, as the head offices of the London and Manchester Industrial Assurance Company, who removed thither two or three months ago. The new premises are part of a large block for which the plans and designs have been approved by the Ecclesiastical Commissioners, who own the freehold of the land. Finsbury-square was laid out in 1787-8, the houses being built by George Dance, the younger. Those on the west side have an ornamented and continuous façade. A branch of a well-known banking company occupies the house at the corner of that side, by Chiswell-street, which, we understand, was at first built for Caslon, the type-founder; the premises were subsequently taken by Lackington, Allen, and Co. for their famous print shop, the "Temple of the Muses," depicted in T. Tegg's large aquatint drawing of 1789. At the south-east corner Dr. George Birkbeck practised as a physician. He was the founder, with Lord Brougham, Bentham, Wilkie, and Cobbett, of the London Mechanics' Institution, and its first president from 1824 until his death on December 1, 1841.

Our Cathedrals. MR. G. F. BODLEY's short paper at the Church Congress, on "Cathedrals: their History and Use," is a very eloquent summary of the place which the Cathedrals occupy in relation to the history of the nation, and their effect on the mind of to-day. He suggests the idea that the Cathedrals were really built "by the will of the people," by united gifts of labour and money. In the case of York Minster, for instance, "the stone for the building was chiefly a free gift of the Vavasour family, while the Ladye Chapel was partly constructed by Archbishop Thoresby with the stone of an old palace at Sherburn, near Leeds. Thus we see how clerics and lay-people alike had their share in the erection of the Cathedral." Speaking of the educational effect of the Cathedrals to the modern mind, Mr. Bodley says:—

"We may be sure that our Cathedrals call out and foster the imagination of the young. I remember when a child being at York, and suddenly and unexpectedly coming into sight of the Minster. It was the first Cathedral I had seen, and I shall never forget the impression and the awe that the mighty fabric gave me. It seemed like a great cliff, wrought over with beauty and stamped with dignity. Such was a first impression.

"And age does not stale the effects that these great works produce on the mind. For there is a mystery and a well-nigh inexhaustible mine of interest about them. They bring us to our knees, and they elevate our souls. Their founders and their builders have long passed, but their works potent and remains—remains to teach, to add beauty to a beautiful world, and to lift our hearts, with their lofty dignity, to a calm, a quiet atmosphere—with 'less of earth and more of heaven.'"

Indeed, it is difficult to realise what a difference there would be in our feelings and our associations to-day, if our great

Cathedrals had never existed, or had been swept away before our time. They are one of the most important elements of national poetry.

MESSRS. Brown and Phillips have on view at the Leicester Galleries a very interesting miscellaneous collection of water-colours by living and deceased artists of the English school. They are mostly small works, but include some sketches by De Wint and Collier which are very characteristic examples of the slighter and more rapid work of these two masters of true water-colour art. Then we have two or three examples of Prout at his best, especially the fine and powerful drawing of the temple of Vesta; an "Old Manor House" by Girtin; a "River Scene" by Cox, remarkable in its contrast between the tender and delicate treatment of the sky and the minute finish (very unusual with Cox) of the boat and figures in the foreground; a drawing of "Fishing Boats at Sea" by Cotman, which is curiously like a Turner sea-piece; Turner's own little drawing of "Nemi"; Varley's interesting drawing of the "Vauxhall" of his day, with old Vauxhall Bridge seen under the trees; and Collier's large and grand drawing of "Arundel," an old friend which we remember many years ago in one of the standard water-colour exhibitions. Among the works by living artists is Sir J. Linton's admirable scene of Gil Blas at the tavern, another old acquaintance—a work quite exceptional in the humour and character of the figures as well as in its thoroughness of execution. In contrast with this collection illustrating so much of the beauty of art, we are invited in the adjoining room to admire the ugliness and eccentricity of art in various works by Mr. Conder and Mr. W. Rothenstein. Mr. Conder's designs for fans and drawings of interiors show a remarkable feeling, no doubt, for colour, but there it ends; the rest is badly drawn nudes (drawing the figure being apparently of no consequence now) and not a little vulgarity of subject and suggestion; while Mr. Rothenstein's, though escaping this latter reproach, have not even beauty of colour. Yet we are invited in the elaborate preface to the catalogue to regard these as important developments of "the serious art which makes the delight of the world." If so, it is surely the worse either for the world, or for art, or for both.

THE death of M. Bartholdi, the late M. Bartholdi, the sculptor, has naturally attracted a good deal of public attention, for the author of the colossal statue of Liberty at the entrance to New York harbour has in that immense and conspicuous work, the largest cast statue in existence, a continual memorial of world-wide fame. Yet we could hardly call him a sculptor of genius. He was a very clever artist, with evidently a great deal of energy and strength of will; but his fame is rather that of a producer of large than of great works; and there are many French sculptors who have modelled no colossi, whose death would leave a much more serious gap in the artistic world. Sculpture is not to be valued or estimated by acreage of surface.

LETTER FROM PARIS.

It appears that two Salons at Paris are in a state of war; the "New" Salon (now fourteen years old) and the Salon d'Automne, only a year old and already the subject of angry discussion. The first, which opens in spring, wishes to forbid its members to exhibit in the second, which opens in October. Having been a failure last year at the Petit Palais, the Salon d'Automne now aspires to the Grand Palais, where its success is very doubtful. Several members of the New Salon, among them such important artists as M. Besnard and M. Carrière, in spite of its formal regulation forbidding its members to exhibit elsewhere, wish to take part in the Salon d'Automne; and the new Salon (the Société Nationale), which is rather afraid of a rival, insists on the observance of its restrictions. The subject is exciting passionate interest among the Paris public; but it really resolves itself into a "querelle de boutique." The two traditional Salons do not suffice for the ever-increasing number of exhibitors, nor content all the different artistic groups. Hence the succession of minor exhibitions which call themselves salons, attract a little of the attention of amateurs, and then disappear. The true and leading French artists of the day have nothing to do with these rivalries, and merely leave them alone.

The public are now able to see for themselves how much superior is the new Metropolitan station of the Place de l'Opéra to the fantastic designs—"style Guimard"—of the existing entrances to the underground stations. The Place de l'Opéra station is designed by M. Cassien Bernard, the architect of the Alexandre III. bridge, who has treated the exterior of the station in a very simple manner and with a low elevation. Instead of a dingy iron-work design there is a stone balustrade in Louis Quinze style, on a curved plan, where a series of colonnettes alternate with blocks of polished marble. The whole is surrounded by a pavement of polished granite, of which the steps are also formed. The new station, which will soon be open to the public, has exit galleries so planned as all to lead into a large open staircase onto the Place de l'Opéra; and thus all the traffic of the three supposed lines can be worked with a single outer entrance, which is 9 mètres in width of opening.

Some years ago, when the Municipality of Paris was rather uncertain in its ideas as to the future use of the Petit Palais, an artist who was a specialist in sporting pictures wished to organise there a permanent exhibition of carriages, harness, and liveries of all dates. This was refused; but now, with the influential support of M. Detaille, the scheme seems likely to be revived at Versailles, where it is proposed to form, at the old "Écuries Royales," a collection of this kind, of which the elements exist already at Clugny and the Grand Trianon, where are preserved the State carriages which have been used by Louis XV., Napoléon, Charles X., Louis Philippe, and Napoléon III. There are private collectors of relics of this kind who it is believed will be willing to add to the proposed museum, either by the gift or the loan of objects of interest; and there is to be a section reserved for automobiles. If properly carried out and the objects correctly dated, such a museum will be of no little interest.

The demolition of the buildings annexed to the Bourse, and which so much disfigure its façade towards the Rue Notre Dame des Victoires, has at last commenced, and it is hoped that the opening out of the Bourse will also be accompanied by the setting in order of the Rue du 4 Septembre, which has been in a state of chaos, for some years, in consequence of the works connected with the Metropolitan railway.

M. Henri Toussaint has been commissioned to engrave a "frontispiece" for the diplomas given by the Société Centrale des Architectes, on which will appear the portraits of the founders of various prizes, Paul Scille, Destors, Souffache, and others. The commission has come from the united body of those who have received Société Centrale diplomas, who wish thus to honour the memory of the founders.

A new legacy for the assistance of young sculptors has been left by the late anatomical sculptor Jacques Talrich (whose death we mentioned some little time since). This gives the Académie des Beaux-Arts a permanent fund from which to assist, at their exit from the Ecole, those who have tried for but have not obtained the Prix de Rome, and who often find themselves in a very difficult position. Sculpture

is a costly and ill-paid art which stands in need of the continual support of the State or the municipalities, and young sculptors without any private means (which is the case with the majority) have a hard struggle before them.

The death is announced, at Nancy, of the eminent artist Emile Gallé, at the age of fifty-two. His works count among the best productions of French art of the XIXth Century. Gallé, who devoted himself specially to works in glass, terra-cotta, and wood, equalled the greatest names among the decorative artists of the past. His contributions to the great Exhibitions of 1878, 1889, and 1900 were of a remarkable character, as well as his exhibits at the Union Centrale des Arts Decoratifs and the Salons of the Société Nationale. His career has been prematurely cut short at a time when, in spite of illness, he was engaged in preparing a series of works for the coming exhibition at Nancy.

The death is also announced, at the age of sixty-three, of M. G. Allar, architect, of Marseilles. He was a pupil of Esperandieu, and Inspector of Works at the Cathedral of Marseilles and at the Ecole des Beaux-Arts of the same city. He was architect of many private buildings, and had much success in various public competitions. In 1881 the Société Centrale awarded him their medal for domestic architecture.

The Société Nationale des Architectes has just awarded the prizes in its thirteenth annual competition, the subject being "A Hydro-pneumatic Establishment in the Suburbs of a Large Town." The jury awarded the first prize to MM. Eugène Chauvat and Marcel Oudin; the second to M. Alfred Schneider; the third to M. Jules Pin; and the fourth to M. Emmanuel Sélonier.

[The death of M. Bartholdi, the well-known sculptor, occurred since the foregoing letter was sent off.]

THE ARCHITECTURAL ASSOCIATION.

The opening meeting of the new session of the Architectural Association was held on Friday, last week, in the meeting-room of the Association, at the new premises, No. 18, Tufton-street, Westminster, S.W. Mr. E. Guy Dawber, President, occupied the chair, and there was a very large gathering of students and members.

The minutes and nominations having been read, the following gentlemen were elected members of the Association:—Messrs. C. H. Yeoman, M. Botting, L. Furniss, G. L. Alexander, and C. Whitley. It was announced that the following gentlemen had rejoined the Association, *i.e.*, Messrs. J. A. Smith, L. Dennis, and C. R. H. Tyndall, and Mr. E. Prioleau Warren was elected a member by acclamation.

The President announced the following donations to the New Premises fund in addition to the amounts already published in the *Architectural Association Notes*, *i.e.*, Mr. C. W. Stephenson, 26*l.* 5*s.*, and Mr. E. Thornton, 5*l.* 5*s.*

Mr. Lewis Ambler, Hon. Sec., announced that the Camera and Cycling Club will hold a meeting on October 11, at 8 p.m., when papers by Messrs. S. B. Bolas and D. M. Mackenzie will be read on "Westminster Abbey."

Mr. Ambler also announced that the conversazioni will take place on October 27 at No. 18, Tufton-street, Westminster. Invitations have been sent out with the recently-issued *Brown Book*.

Distribution of Prizes, &c.

The President then distributed the prizes, &c., gained by students last session, as follows:—Mr. Maurice E. Webb, Advanced Class of Design, first prize, value 5*l.* 5*s.*, Bronze Medal, and pass for Modelling Class; Mr. G. Drysdale, A. A. Travelling Studentship, value 25*l.*; Mr. A. Horsnell, A. A. Travelling Studentship, second prize, value 5*l.*; Mr. C. E. Piusent, Class of Design, second prize, and pass for Modelling; Mr. J. A. Hallam, A. A. Silver Medal and prize value 10*l.* 10*s.*; Mr. D. G. Round, Elementary Class of Design, first prize, value 3*l.* 2*s.*; Mr. F. J. Watson, Barr, Banister, first prize, value 2*l.* 2*s.*; Mr. F. J. Hodgess, Andrew Oliver Prize, value 3*l.* 3*s.*; Mr. F. T. Bush, Andrew Oliver Prize, value 2*l.* 2*s.*, and Studio Prize, Volume A. A. *Sketch Book*; Mr. C. R. Davy, Studio Prize, 2 Volumes A. A. *Sketch Book*; Mr. J. H. Markham, Studio Greek and Roman Class; Mr. J. H. Markham, Studio Travelling Studentship, value 15*l.*, and Studio Prize, Volume A. A. *Sketch Book*; Mr. T. Braddock, Studio Prize, Volume A. A. *Sketch Book*; Mr. H. M. Whiddington, Studio Prize, Volume A. A. *Sketch Book*; Mr. M. R. Martin, Elementary Construction Prize; Mr. H. L. Sanson, English Architecture Prize; Mr. H. H. Christie, Medieval and Renaissance Prize; Mr. A. T. Groves, Elementary Physics prize, and Professional Practice

prize; Mr. T. W. Watkins, Materials and Ventilation Prize; Mr. L. T. Sifton, Construction Prize; Mr. Crawley, Drainage Prize; Mr. S. H. J. Murch, Surveying Prize; Mr. A. Welford, Day School Travelling Studentship, value 15*l.*; Mr. A. N. Peckham, Day School Prize, Volume A. A. *Sketch Book*; Mr. R. C. Cook, Day School Prize, Volume A. A. *Sketch Book*; T. F. W. Grant, Day School Prize, Volume A. A. *Sketch Book*.

President's Address.

The President then delivered the following address:—

Gentlemen—The present occasion marks an epoch in the annals of the Architectural Association.

It is the first time that an address has been made from this chair in a building devoted exclusively to the uses of the Association, we may well feel proud that our effort to attain this result have been crowned with signal success. I do not wish to weary you with an account of how this has come about, all that is ancient history and was fully set forth in the address of your President last year. It is my great privilege to declare the summation of our desires has come to an end, after more than half a century's wait the Architectural Association has at last found a home of its own.

For many years past, our growing needs and requirements, and the increasing number of members, rendered the removal from our cramped premises in Great Marlborough-street a necessity—a change was bound to come sooner or later; so that when the Royal Architectural Museum premises were offered together with the leases, the Association gladly took the requisite steps to avail itself of the offer, and undertook to manage the museum and to keep it open to the public as before, and I would like to take this opportunity of thanking Mr. W. H. Jamieson, our hon. solicitor, for the infinite pains he took in connexion with the transfer of property. To meet our needs, the building required considerable alteration, but the Committee felt that this was the opportunity to obtain studios and lecture rooms that the work of the Association could be carried on properly without being hampered by lack of space. It was therefore decided to have the heavy outlay connected with the work and for all, and have thoroughly useful well-equipped premises. This most important work—the re-arrangement of the building—entrusted to Mr. Leonard Stokes, and I feel we can congratulate both him and ourselves upon the successful issue of his labours.

In addition to premises of our own we have also an admirable collection of casts and models which originally formed the Royal Architectural Museum, and there is not the least doubt that will prove of great value to students and form a very fitting adjunct to a society such as ours. It will be a matter of great labour to arrange for the display of these casts in some chronological sequence, but a start has been made, under the able direction of Mr. W. G. Lewis, and we hope in time not only to see the work completed, but a revised catalogue compiled, so that both the public and the profession may be aided in their researches, and take intelligent interest in what is a most unique collection. This work, however, has not been accomplished without incurring heavy responsibility, and the indebtedness of the Association has reached a total of about ten thousand pounds. Of this amount over five thousand pounds have been subscribed, of which the R.I.B.A. kindly contributed 500*l.*, and a generous donor has offered a further sum of a thousand pounds conditionally upon the balance being raised before the end of this session. We need, therefore, about four thousand pounds, and I feel sure all members of the Association and professional will respond most generously to appeal for help to clear off this debt. If members would bring the matter before any of the who are interested in the education of architects and the advancement of architecture, we might soon expect to be free from the liabilities of this nature. Apart from this Association as a body is in a thoroughly prosperous condition. Our membership continues to grow year by year, during the past sessions at the rate of over one hundred annually.

It is especially gratifying to find old and new members of the profession wishful to enter themselves in our ranks. Great and varied our work is, the enthusiasm of all is well maintained. I feel sure a great deal of this is attributable in no small degree to the able guidance

retiring President, Mr. Henry T. Hare, whose illing energy, tact, and ability, have done much during the past two years to forward very far the interests of the Association. I do not too much to say that the Architectural Association, as a body, owes much of its growth and vitality to the admirable way in which, in the past, it has been served by its Presidents. Officers, who have spared neither time nor effort on its behalf, and in taking up the reins of office for the coming year, I feel a great responsibility devolves on me to maintain this tradition.

Education and the Association.

The Day School, under the mastership of Mr. P. G. Maule, is now firmly established in new quarters, and the comfort and convenience of the spacious studios is greatly appreciated by both students and instructors—and it would be impossible to find in London more complete set of rooms adapted to the needs of the school. It is now commencing its 11th session, and has proved an unqualified success, which must be a source of great satisfaction to our past President, Mr. W. H. Smith, to whose initiative the Day School largely owes its origin. It was a difficult task to fill the post of headmaster, but Mr. Arthur Bolton so well occupied, which he relinquished after two years of arduous work. His was a labour of considerable difficulty in organising and inaugurating a definite curriculum. The selection of his successor, Mr. Maule, entirely justifies my high opinion your Committee had of his fitness for the position, and the Association every reason to be well satisfied with the manner in which he is carrying on this onerous and responsible work. The main idea of the Day School is that pupillage should be preceded by a special elementary training, preparatory to entering an office. Many consider it desirable that a student should be grounded systematically and thoroughly in the rudiments of his work, before he may begin to study the history of architecture and its development in various countries, and obtain some insight into the principles of design and construction at the outset of his architectural career.

At the expiration of either one or two years in the school, a student entering an architect's office will have gained a sufficient elementary knowledge to be able not only to take an intelligent interest in his work, but to utilise to the best extent the results of his preliminary training. The advantages to a student who is equipped beforehand in this way must be obvious to all, and I am convinced that in a time to come the school will be recognised as rendering great service to the profession at large. We have also this session established an evening Continuation School, under the mastership of Mr. T. Frank Green, to enable students who have passed through the Day School to carry on the work in a systematic way, concurrently with their articles in an architect's office.

I do not intend to deal in detail with the details of the various evening classes, but I do intend to draw the attention of members to the Classes of Design—both Elementary and Advanced—which are visited by many of the eminent architects in London, who generously give their time to the service of the Association. It is a great advantage for a student to be able to work out a series of designs, to have them examined and criticised in open class, and to see how his work compares with that of his fellows. This not only promotes a healthy rivalry, but enables him to see the progress of his own making and what his capabilities are, and to be in the counting session that many more join these and the other classes. Students should make a point as much as possible of doing this, and in some way or other to take advantage of the training the Association offers. The fees for these various classes represent a capital well invested, and, if only from a commercial point of view, assistants can always find a larger salary if properly equipped. The Register of the Association shows only too clearly that this is so, as there are always twenty per cent. more non-members wanting berths than members.

The Architectural Association represents the most educational body dealing exclusively with the training of architects in the United Kingdom, and is, I think, the only Society in which teaching has been carried on systematically from its foundation in 1847. There are no less than six Schools of Architecture at the Royal Academy,

the Royal College of Art, and the Universities of London and King's College, and also Liverpool, Manchester, Glasgow, and Edinburgh, at some of which a regular course of study is pursued. Though there are no less than eighteen other architectural societies scattered throughout the provinces, it is only the Architectural Associations of Birmingham and Ireland that hold Classes of Construction, Design, and History. The Devon and Exeter Architectural Society, founded in 1890, have, however, established classes for the teaching of Design, and it has been arranged for some of our members to visit periodically and criticise the work—our valued past-president, Mr. G. H. Prynne, undertaking it for the ensuing session. It is much to be desired that other societies would follow this example, for, although in many of the places where they exist there are technical colleges, schools of art, and institutes, yet these do not and cannot train architects in the systematic and thorough way which is felt nowadays to be a necessity.

The question of education occupies the attention of most thinking men, and, as a profession, we can no longer afford to allow our students to be trained in the haphazard methods of the past. It is much to be hoped that the report of the Board of Education Committee appointed by the late Council of the R.I.B.A., comprising, as it does, many of the soundest educational experts of the day, will result in the establishment of some definite scheme of training which can be accepted as a basis by the various teaching bodies throughout the Kingdom. I feel sure the Architectural Association would welcome any suggestions that would tend to bring its work into line with this new movement, and thereby further enlarge and extend its sphere of usefulness.

I regret to announce that eleven members have died during the past session, amongst them, only a few weeks ago, being Mr. C. K. Toe, one of the most promising of our day school students.

This year has been memorable, in that one of our members, a young and most talented one, has seen the inauguration of his design for Liverpool Cathedral take place. We must heartily congratulate Mr. George Gilbert Scott on his brilliant success, and the Association, as indeed the whole profession, will watch, with keen interest, the development of his great work.

The Laying-out of Streets and Diversity of Design.

We are living in a wonderful age of building, when houses, streets, great towns indeed, spring into being almost in the space of days. In London, large schemes are in hand, such as no previous generation has ever known, and which are changing the character of whole districts. The most conspicuous feature in this new architecture is its entire absence of uniformity or consideration of surroundings. Architects, with varying success, have given rein to their imaginations without allowing themselves to be controlled or influenced in any way by neighbouring buildings; so that our streets present a want of character and scale which is singularly unsuitable in a city such as this. That this should be the case where many of the buildings individually are most admirable, is lamentable, and I cannot help thinking that it is a matter for regret that in this country we have no Ministry of Fine Arts, or some consultative committee on art who could advise when sites come into the market, or buildings are pulled down, as to the form the rebuilding should take, or what improvements or modifications in the design would conduce to the future dignity and beauty of the City.

It is, perhaps, too much to hope that the London County Council will control the capricious talents of architects and builders in Aldwych and Kingsway, but the greatest opportunity of recent years will be lost if such sites are allowed to be covered with individual erections—the creations of commercial syndicates, too varied in style and material to give any dignity or character to their environment. The recent changes in the Strand have proved that a great deal of the beauty of Saint Mary's came from the fact that the church was so well fitted in style and size to the position in which it was built, and to the height of the houses around it. I venture to think this essential principle is not sufficiently regarded in most of the new buildings we see on all sides. This feeling of inequality and lack of proportion is

more noticeable in our street architecture than in anything else—there is no settled tradition in building; no definite aim or standard in view, and all treat different things in different ways, and the "loudest" and most garish edifice attracts the most attention. This, again, is emphasised in the treatment of our shops, where massive buildings, many stories high, rest with no visible means of support upon huge sheets of glass, whilst the façades of many others are covered and disfigured by enormous letters and advertisements. It is indeed strange that we should, as a nation with some claims to taste and refinement, tolerate these shams and eyesores that mar and spoil the finest streets of all our large cities and towns.

I cannot help thinking we have lost a good deal in the beauty and consistency of our street architecture since the days when such men as the brothers Adam, Chambers, Nash, and the Woods of Bath gave us their quiet façades and street fronts, all based on some definite idea and planned on a big scale, and though perhaps slightly uninteresting to us to-day, yet possessing dignity, scale, and symmetry. In street architecture the mass should be the main idea and the individual building should be subsidiary to the general design, but exactly the opposite seems to be the prevalent idea to-day, and one cannot help looking forward with some degree of misgiving to the result of such experiments as we see in Regent-street, which break the simple lines and grouping of what, however much its monotony may be abused, possesses some claims to design on a monumental scale.

Without doubt, all this variety, this diversity of idea and design which we see everywhere throughout the country, is attributable to our lack of architectural education in the past—we have not learned in any school, nor on any method, and hence our architecture, like our training, is individual and haphazard, everyone building what best suits his taste, just as our students study or pick up their ideas in a haphazard manner. On the other hand, in essentially domestic architecture, this country stands pre-eminent. Our country houses possess a character and quality of which we may well be proud, and in this branch of our art a commonsense and legitimate use of material is producing a style that stamps the building of to-day. In municipal architecture we have also vastly improved during the past decade, and many of our modern buildings are well worthy of comparison with the works of masters of bygone years.

But as a nation we have quite failed to recognise the importance to the community of well-thought-out schemes of building and their environment on a large scale. We lack in England that spirit of civic pride which is so pronounced abroad—a pride in the beautifying of our cities and towns that makes one vie with the other in a display of noble buildings, dignified squares, and that co-operation of architect, sculptor, and painter, which alone can produce great and noble works of art. The least observant cannot fail to be struck by the feebleness of conception shown in dealing with the various sites that come into the market. It is deplorable that they should be regarded merely as commercial speculations, to be covered with buildings with neither character or individuality, and without the least regard for their surroundings, and perhaps more than anywhere else this is seen in the development of our suburbs. On the Continent this problem is dealt with in a systematic way, and the various municipal authorities prepare the layout of the general scheme, the lines along which the extension is to take place and the proportion of the whole site which may be covered by buildings. It is a great pity that our English town councils do not study the admirable work of town extension now being done in Germany, and do not obtain Parliamentary powers to do similar work here; our towns might then be developed and improved on broad and dignified lines instead of the haphazard way we now deal with a question that is worth far more consideration than is given to it.

In this country the interests and rights of the individual are so jealously guarded that it is almost impossible to effect improvements, so that it is utopian to hope for the wide avenues, open spaces, gardens, and fountains, such as we see and admire in foreign cities. A longing for light and air, though unexpressed on the part of the public, is evident from the desire shown to live away from the over-crowded centres of our towns

—to spend some few hours in the outskirts, where sufficient air space can be given to the houses, and where streets can be wide and open spaces provided. But unfortunately the country surroundings of our towns and cities are so rapidly becoming alike, so levelled down to one dull cosmopolitan stamp, that the people who live there forget, or never realise, that there are towns and cities which can boast of long antiquity and a noble history, and contain ancient and venerable buildings. They form as they grow up their impressions of architecture from that they live amongst and see on all sides, and if their surroundings are commonplace and mean, can it be wondered that by them architecture is regarded with indifference, and that beautiful buildings arouse no feelings of reverence and appreciation?

It was estimated in the *Times* recently that London suburbs were spreading and filling so fast that as many as nine hundred thousand people settled in them, in new houses, in ten years; and that to Greater London every year is added a city the size of Norwich! It is difficult to realise such a fact when we contemplate it seriously and think of the old cities of mediæval days, crowded with beautiful buildings which cost long years, even centuries of toil and thought to create, when building was for all time and architecture a living force. To-day, when these communities grow like mushrooms, I feel that this is almost a national question, and, unless some steps are taken to plan our new towns and their surroundings on better and more artistic lines, that architecture, as an art, will very greatly suffer.

Experiments have been made in recent years in this country, of building and laying out towns and villages on some artistic basis, and with very satisfactory results. The paper that was read last session on the Bournville settlement, showed that these buildings could be erected to pay a fair return of interest for the outlay, and entirely disposed of the fallacy that to build artistically is more expensive than otherwise. There can be no doubt that the influence of communities such as these must eventually have a great effect on the taste of the public. But unless this question of the extension of London suburbs is dealt with on some such lines, we shall be surrounded by a belt of appalling monotony and ugliness, as every suburban extension makes the existing suburbs less desirable.

Building By-Laws.

I have up to now dealt with towns and cities, but there is another thing that affects our present-day architecture, especially in country districts, and that is the building restrictions enforced in nearly every part of the kingdom. I make no apology for introducing the subject before such a society as this, as its effect on the work of the country is wide and far-reaching—to architects these by-laws are only too well known, but the public do not realise in the least the baneful and cramping effect they are producing. Buildings in cities and populous towns must of necessity be under conditions, but in country districts these restrictions should be relaxed, as the circumstances are entirely different. That the same rules framed originally for dealing with buildings in crowded cities should be applied indiscriminately all over the kingdom, and that only certain materials should be used in particular ways, not only tends to make our architecture lifeless and uninteresting, but causes the neglect and discouragement of many of the old crafts and methods of building that made our country districts so picturesque and interesting. It is now frequently only on large private estates that building can be carried on without interference, for, owing to the extended powers granted to the Urban and District Councils, and the wide areas they cover, properties miles away from the nearest town or village, and in many cases entirely isolated, are now compelled to conform to these vexatious restrictions. Surely the time has come when some broad and sensible regulations should be made, and these unnecessary and mechanical by-laws modified, which are of little use in preventing jerry building, but which harass all good designers, besides adding largely to the cost.

These by-laws, again, are killing the last lingering country crafts still in use, just as the so-called "improvements" have changed the surroundings of the poorest peasant. He now has no distinction of dress; his antique smock has been discarded for the cheap tweed suit, his wooden clogs for ready-made boots. In his

work he no longer uses the scythe, the sickle, and the flail, but has become a mechanic, and does most things by machinery. His cottage, too, is changed, and is built now in depressing rows, after the ugly model laid down by the Local Government Board; the open hearth has given place to the stove, the red-tiled floor to linoleum, and the old-fashioned lattice casements to sash windows and coloured glass—all things that doubtless conduce to his material advantage, but certainly to the great loss of picturesque effect.

Of course it is idle to wish for those old days to return; circumstances are altered, and as architects it is imperative for us to keep abreast of the times, but I would urge you to remember that there is an architecture for the country as for the town, and to bring the one into the peace and quiet of the other is altogether out of place. Each building should be treated with due regard to its position, aspect, and environment as a separate problem, and also with reference to the local materials of the district. It is the employment of so many and varied materials, out of all harmony with their surroundings, that has done so much to destroy the local styles and characteristics that once made all country building in England so beautiful. Many are inclined to reproach the public for their apathy and lack of sympathy with the architecture of to-day, but does not a large amount of the fault lie with architects themselves? The public judge architecture by what they see around on all sides, and when we look on the vast amount of building throughout the country erected thoughtlessly, hastily, and with an entire absence of taste, much of it, indeed, done by men who do not claim to be architects at all, it is not to be wondered that the estimation of such work should be low, and that the press of this country should treat it so indifferently.

Architectural Design.

Gentlemen, all these are broad questions not unworthy of your careful consideration, and though they may appear to our younger members as dry and uninteresting, it is essential that they should be conversant with such matters, which in after years will force themselves on their attention. But do not believe that architecture has vanished as the pessimists say, for at least we are not satisfied with its substitute, and though houses and costumes perhaps fall short of mediæval grace and colour, yet both are tending to become more seemly and convenient than those our forefathers knew. Slowly, but surely, we are striving for, and I think arriving at, that combination of beauty and utility wherein lies the truest, perhaps the only true art, and we have to-day an ever-increasing body of able and thoughtful men, who are doing work that is worthy of our highest admiration, and which is awakening the interest of the public in an art which for years past has been regarded with comparative indifference. In architecture, decoration, and the plastic arts, there is a strong and virile movement permeating the country, not only to treat material sensibly, but with freedom from the fetters of bygone schools of design. It lies in your power to forward this movement, to train your hand and eye, to study and labour in the profession you have chosen, remembering always that as the coming generation of architects with you rests a great responsibility. I would have you think of architecture from a national standpoint as a great power, and make up your mind from the day you enter the profession to devote yourselves to the uplifting of the noblest of all the arts. Your work will be your greatest recompense, and if you throw your heart into it you will find it a never-ending pleasure and engrossing pursuit to the end.

Look at things largely and try to think in the mass, and do not design your buildings as separate elevations, but picture them in the round, as imaginary buildings, that you can feel and handle, and plan out the surroundings, and the environment, so that the whole is complete in every way. If you accustom yourselves to this habit of thinking of your designs as a whole, you will be surprised at the grasp of idea it will give you and the increased pleasure you will get out of your work. Study the work of our best living men whenever you have the opportunity, as well as of those long since dead, and do not neglect the prosaic present for the picturesque past.

Whenever you see a beautiful building or work of art, either one just completed or an old one coloured by the mellowing hand of time,

one that instinctively impresses you by a sense of proportion and fitness, try and analyse it and find out what it is in its conception or construction that produces this effect. Cultivation of this habit of analysing everything you see, of dealing with actual existent facts will help you to design and plan far more studiously hooks and illustrations.

The reason we admire old work so much, I think, partly sentiment and partly because it is, as a rule, thoughtful and honest—the feeling of reposefulness, of satisfaction, of charm that so much modern work lacks, and it is this spirit, this intangible something that one feels but cannot express in words that you should strive to attain and which give character and beauty to your work. The spirit and the thought behind the design that makes a beautiful building, and the thought you put into your work the better nobler will it be.

Sketching and Measuring.

So much is being done nowadays to encourage practical training and technical education that many are apt to neglect the more artistic side of their work. The recent Exhibition of holiday sketches and drawings, at the Royal Institute of British Architects was quite a revelation, and showed that architects in our practice can yet produce most clever artistic drawings and sketches. By some of our younger men, sketching and measuring understood, is not nowadays in favour, and tends to keep alive that interest in the traditions of the past which many consider harmful cramping. But, in my opinion, there is no better training for an architect than the study and analysis of buildings, both old and new; it helps you to cultivate a sense of proportion to appreciate the beautiful in art, and, more than anything else, the means by which their results were attained.

Apart from anything else it teaches you to draw in perspective, to see your building in the round, a point I have already urged, and an invaluable aid in designing to be able to draw your schemes clearly and rapidly, as you know, designs which look well in elevation, often look very different in perspective. Cultivate a good style of draughtsmanship, remember that the object of all architect drawing is clearly to explain your designs to those who will carry them out, so that the tricks and mannerisms should be avoided which do not convey any practical meaning.

In these days, when travelling is so easy you should take every opportunity of study and comparing in each country you go to different ways in which similar problems are treated, and the materials and workmanship with which they are carried out; this will broaden and enlarge your mind, and you gain many valuable lessons in design and construction. But do not sketch or measure for the object of copying old forms and features for mere servile imitation is a sure sign of decadence and lack of creative force. At the same time avoid going to the other extreme and in your efforts after so-called originality becoming "banal" and grotesque. Guard against being carried away by the love of the pretty and picturesque, the passing fashion of the hour, and recollect that eccentricity is synonymous with genius. Do not worry over trifling details, trivial mouldings, and such things; the greatest and noblest buildings are those that impress us with their breadth and dignity, as a rule, are very simply treated. You know that ornament must follow construction, and that this again must be based on the proper use of material, and, though the tendency of the day is to try to be original, produce something fresh and striking, yet venture to think, and indeed hope, that instead of what we see around us is only ephemeral and will not hold its place in years to come, as representative of our architecture to-day.

Beauty in architecture does not result from richness of material and profusion of ornament, but from elegance of form and proportion, harmony of colour, and perfection of execution, and in a large measure from the intelligent application of material to its proper purpose. Many do not sufficiently remember this, and forget that all materials have their limitations and uses; so consider well the suitability of your designs to the materials you would build them in. Details and features that are right in one are wrong and out of place in another. It is unnecessary to

again to err on the side of simplicity and restraint in your work. Everyone can add his design with meaningless ornaments in detail, but few have the power of being able to know exactly what to use and what to omit. This can only be gained by careful study, by thought and experience, and though sometimes you may get discouraged and feel that your work is at a standstill and you are not improving, yet this very dissatisfaction may be the means of benefiting your work in the future.

It will encourage and help you, if you will devote some of your leisure to reading the lives and biographies of our great architects and artists. You will find that they had the same troubles and difficulties to overcome that you are bound to meet with in your career, and that they learnt in the hard school of experience, just as you will do.

You should lose no opportunity of visiting buildings in progress, and of going to see workshops and acquainting yourselves to actual materials and how they are used. The spring and summer terms arranged by the Association to buildings admirable, and should be better patronised than they are. If students could get a few months, or even longer, on a building in progress, advantages would be inestimable, for there is nothing that is so useful as practical knowledge gained first hand. This, again, bears on a very debatable question of craftsmanship, which several papers have been lately read.

The Function of an Architect.

It is a common feeling that if a man means to be an architect all his time and thought should be concentrated on his work and in that action alone, and to attempt to make himself master of any of the subsidiary crafts, to work in his own hands on buildings of his own is a mistake. I have never been able to ascertain if any of the greatest architects of the past were craftsmen in the sense that we use the word to-day, and I do not think that any workman of any of their known buildings can be pointed out as actually executed by them. The function of an architect should be to design and have the control of the entire building, to be the master builder in fact, and to be conversant with all work being done. He should, as far as possible, have a knowledge of the technique of the various trades and crafts, and be able to direct and control them all, in more than this seems unnecessary. To learn himself personally with matters of detail craftsmanship must be to the detriment of his buildings, because an architect cannot carry out the multifarious duties required to-day and find time to do these things as well; though of course if an architect wishes to work with his own hands, and has a tendency that way, will doubtless produce excellent results, but the idea in buildings of any magnitude or importance seems out of the question. Do not get astray with theories such as these, but and gather round you artists and craftsmen in the allied arts, who understand and sympathise with your aims and who will work with you. That is what all our great architects have done and what we should try and do.

In conclusion, cultivate that spirit of comradeship with your fellow students which has always been one of the chief aims of the Association, and if you possibly can, take some part, however small, in the good work it is doing. The aim of the Association has always been to be of service to its members, and this is the spirit that has enabled it to maintain its almost unique position. May you be your lot to stand by the wayside and help others pass you in the race of life, for its prizes are only for the few; but do not be disgraced, for if you do the work, however small, which comes to your hand to the best of your ability and power, it will not only bring its own reward, but will help and encourage those around you to follow your example.

Mr. Aston Webb, R.A., said he felt proud that he had fallen to his lot to propose, on his own behalf and on behalf of that large gathering, a hearty vote of thanks to the President for his most admirable address, on what, without exaggeration, might be called, so far as the occasion was concerned, an historic occasion. He had all dreamt for years of a home for the Association, and that night they woke up from their dreams to find it a reality. He spoke a little sadly, because he felt that the day had come when he ought to cease to play that rôle, and on their opening night,

therefore, he was afraid this would be his first and last appearance on the Tufton-street stage. He did not think there was a single word in the President's address with which he did not entirely agree. It was only to be expected that the President should refer to the architect to whom they were indebted for the conversion to their uses of that building, and he thought they could all congratulate Mr. Stokes on the happy issue of his labours on their behalf. He hoped they would long occupy the premises, and in that connexion there was a little story he might tell. A judge had been doing a great deal of work to his house, and a friend said to him, "I suppose you have a long lease of the house?" The judge replied, "Lease! A lease is no use to me. I have got the freehold, and I mean to see it out!" The Association, if carried on with the vigour with which it is to-day, would certainly see its lease out, whatever length that lease was. There was the little doleful point the heavy financial deficit to refer to, but the Association had never yet been beaten, and he did not for a moment suppose it would be beaten in this matter. A magnificent offer (there were not many architects in London or elsewhere who could make it) had been made by an anonymous gentleman, and he (the speaker) would, on the same conditions, be glad to make a modest addition of 50% to his donation. The President had made one alarming statement, i.e., that the membership of the Association was increasing at the rate of 100 a year! It really was a serious matter for architects generally that there should be this increase. To another gentleman the President had mentioned, Mr. W. H. Seth-Smith, a great deal was due for starting the Day School of the Association. Mr. Seth-Smith's scheme when it was first proposed did not, perhaps, receive that support it might have had, but by persistence and perseverance Mr. Seth-Smith carried it through, and the Day School marked a very important departure in the education of architects and would be one of the most beneficial things that had ever been done for the education of young architects. It had already proved a success, and as time went on it would be found to be indispensable, and it would be a matter of wonder how architects ever got on without preliminary training before entering an architect's office. The address referred to a matter that greatly interested him, i.e., the subject the Board of Education was now considering—a general scheme for the education of architects. That Board consisted of many who had been known for a long time to take a great interest in the subject, and he believed and hoped that the deliberations of the Board would be of some use; but it could not be of use unless the educational bodies of the country assisted the Board, and it would be a great encouragement to think that the Association would be ready to consider suggestions which might be made. If the Board had the co-operation of the Association, as he believed it had, in the one object, i.e., the improvement of architecture, a great deal of good would come of it. Architects had been going on for some time on a certain system, and it seemed to him and others that the time had come when they might take stock of what they had done and also see if some improvement in the architectural curriculum could be made. His own feeling was that the system on which they had been working had tended rather to the exercise of memory on the part of students than to the exercise of thought and judgment in the design itself—that they had tended rather to the study of details and had omitted the great problems which presented themselves to all architects, whether on a great or small scale. In his student days, when they entered a church they looked at the door, took a sketch of the jamb and the arch moulds in order to send a little drawing to the Architectural Association Sketch-book; when they went inside, if there was a screen they took a sketch of the carving and perhaps one or two of the mullions, and generally looked out little bits which would form an easy and useful little sketch. Very often they missed perhaps the whole interest that the church may have possessed, as he was thinking the other day when he was in a west-country church. He noticed, what was to be seen in many west-country churches, that the nave and chancel were of the same height; but, what was not so often the case, the transepts were also the same height, which gave the architect the opportunity of putting a barrel ceiling over the nave and chancel, and also over

the transepts, so getting a groin at the intersection over the nave; the arcade was continued straight through to the chancel arch, but the wall was not carried up to the roof, so that one saw the roofs of the transepts over the arcade, giving a delightful and unusual perspective effect. What they wanted to teach students to see and understand was the scheme of the whole thing; the detail was a matter as to which the individual feeling and character of the man who designed the church should be left, to a great extent, unrestrained. Students would learn more from the general design and scheme of the architect of buildings visited rather than in looking at small details—mouldings, carving, and such like. The President had touched on another subject in which he (the speaker) had taken much interest, i.e., the desirability of some control, or some advice, in the laying out of towns and cities—both new and where great alterations are in hand. The subject had been sympathetically received by the present First Commissioner of Works, and it was quite possible that, if the profession supported the idea, that in time something of the kind might be obtained. They all regretted the stage in which the matter of the great new street of the London County Council stood. There was the competition for the selection of a design, the design was selected, but then no further action had been taken upon that. That was a matter of great regret; and, although they all knew that the London County Council were anxious to do the best, he should like to see some expression of opinion amongst architects that more decisive steps should be taken before it was too late to prevent that great street being built on in the style described in the President's address. During the last two years an important Commission had been sitting in reference to streets and traffic, and, as far as he knew, only one architect had been called to give evidence, and, as far as he could gather, the evidence of that one witness gave more suggestions than nearly all the others put together on the general layout of a city. It might be an ideal scheme, but it had the germ of an idea, i.e., radiating roads from London to the suburbs which would, to a great extent, redeem London from that monotony and dullness which the President had so properly objected to. He had always thought that it is a most unfortunate thing that the municipal bodies of the cities and towns of England had dispensed more or less with architects as their advisers, and had engaged surveyors instead—absolutely necessary gentlemen in certain work; but, after all, in the formation of new streets, etc., there was something more required than the convenience of traffic and excellence of drainage; there was the question of æsthetic appearance, and the man who could give the best advice on that was the man who had been trained in such matters, and he was, generally speaking, the architect. That brought them to the final duty of the architect, which was to beautify—the final aim of the architect was not only to make a building convenient—that was essential, but it was not architecture. The final goal of the architect was not only to build well—the builder could do that—and that too was absolutely essential, but it was not the highest point. It was not that he should conclude his work at exactly the estimated cost—of course, that was what they all did. No, the highest aim of the architect should be what they often found so difficult and what they were always striving for, i.e., that there should be beauty in the buildings they put up, and that was what people had a right to expect from architects. The opening meeting of a new session of the Association would not be complete without quoting their motto, i.e., "Design in beauty and build in truth." The two things were synonymous; the poet had said: "Beauty is Truth; Truth, Beauty." "That is all we know upon this earth, and all we need to know."

Mr. H. L. Florence, in seconding the vote of thanks, congratulated the President in occupying the chair at the commencement of a new phase of life of the Association—a phase which he hoped would be crowned with success for a long period. As to the President, they had not only been encouraged by his precepts that evening, but they knew the admirable buildings he had carried out in which they could see the reposeful charm the President had referred to and the happy English character he had given to all his works. A considerable portion of the address had been taken up in the consideration of big problems; for instance, the development of large towns. All towns after a time needed

reconstruction and redevelopment, as could be seen to a far greater extent in some foreign capitals than in London. There were many opportunities in which a more united effort and a more supreme control would doubtless be a advantageous, but at the same time this was not always the case. He had just been reading that in New York there was a municipal Art Committee and other well-known and powerful art committees which were hopelessly at loggerheads on the subject of a new bridge. One committee had chosen one design and another committee another design, and the erection of the bridge might be indefinitely postponed. So that the committee proposed by the President might not be an unmixt blessing. What might happen they saw to some extent every year in London. We had an annual exhibition of Art—painting, sculpture, and architecture—the works constituting which were judged solely by artists distinguished over all others in their separate spheres; but he thought he was right in saying that this did not result in an unqualified success. In many instances far superior works to those accepted and put in prominent places were rejected. Again, the practice of leaving matters of art and taste to the decision of assessors did not meet with unqualified approval, and it did not follow that those who were supposed to be, and indeed were, eminent in art and quite capable of giving individual opinions on such matters were those most qualified to determine important competitions or great public improvements. A union of qualities was required for the purpose which was rarely met with in those who devoted their attention to one particular kind of art. The circumstances in which architects of the past built were so different from the circumstances of to-day that there were few neighbourhoods in which schemes on old lines could be successfully carried out now. The tendency now is to build to far greater heights, and while streets were much the same in width, it was obvious that the treatment of the lower stories of buildings must be modified in order to get that light which was essential to making buildings suitable for their purposes. That would account for some of the deficiencies in some modern buildings in London. As to broadening thoroughfares, that invariably led to the displacement of a great many inhabitants, who were accommodated in the immediate suburbs of large towns, where the result was generally interminable and unlovely lines of streets. It seemed to him that some more determined effort should be made to preserve the old houses and grounds in London and such cities—that was to say, the old houses and the many acres of ground attached to them in such neighbourhoods as Clapham, Denmark Hill, Peckham, and Dulwich. If these houses and grounds had been preserved and kept as open spaces, a work would have been done which would have been of lasting benefit, and London would have been surrounded by agreeable neighbourhoods; there would have been better sanitation and health, and Londoners would have had more joy in living than they have now.

Mr. H. T. Hare said he should like to congratulate the President on the position he held that night, and to say how proud the Association was to have him in the chair. This was an historical day for the Association; it marked a distinct step in advance—a very serious step, which had been taken after due consideration, and there could be no doubt that the position of President involved a very great deal of responsibility and a very large amount of hard work and application, but they felt sure that the destinies of the Association would be safe in the hands of their President. As to the deficit on the building, the very generous offer which had been made would, he hoped, lead to other generous offers, and that the whole of the amount required would be wiped off by this time next year. As to the development of cities, that was a question which concerned architects very nearly. The President had referred to the desirability of buildings in streets having some uniformity, and with that a great many of them would agree to the fullest extent; but unfortunately there was a great diversity of opinion in the matter, and he frequently heard architects and people who were interested in the arts express the opinion that London is the most beautiful of cities and that its beauty is largely owing to the fact that there is no uniformity—that you never know what you are going to meet as you go along the streets. In his opinion that view was entirely wrong for a large city, but while this diversity exists amongst people who

ought to know better we could not wonder that the authorities did not take a strong line in directing the progress of building operations in that direction, and this want of taste on the part of a certain number of people was almost entirely due to the fact that up to now we have had no systematic course of education for architects—no standard of taste for architects. Almost all other countries have a definite course of education for their architects, and that tended to the formation of definite views and standards, and that was what the establishment of the Association school might ultimately lead to. Of course, before that could be accomplished the Association must become a much more important institution than it is at present, and he had no doubt that it would grow until it became one of the leading influences in the education of architects. As to the cramping by-laws which exist in London and the country—more particularly in the country—that was largely due to the want of education—to the fact that the people who drew up these by-laws were not advised by anyone except the surveyor who had not had an education as an architect and who looked at matters from a building scheme point of view only—or his own point of view, which was not the point of view of an architect or an artist, whose ideas were ignored in drawing up the by-laws. That could not be altered until the officials of corporations and other bodies were educated in some way to see the artistic standpoint. As to the formation of a Ministry of Fine Art, that was an ideal which they would all like to see taken up; if it was to be adopted, pressure in that direction would have to come from the profession. These reforms would never be initiated from inside; architects must keep on using pressure until their views were to some extent agreed to and adopted. With regard to the curriculum they had established in the Day School, he believed it to be a most excellent one, but no doubt as time went on it would be found susceptible of improvement; but as to the craze or wish to establish some sort of school of craftsmanship, he was not altogether in sympathy with that. It was a hopeless thing, and useless to endeavour to make an architect a craftsman, and it was a waste of time, for he would never become a good craftsman, and he need never know much more than the theoretical principles which govern craftsmanship in any particular trade.

Mr. Webb then put the vote of thanks to the meeting, and it was very heartily agreed to. The President briefly replied. His great ambition was to see the Association at the end of their term of office free of debt, so that, under their then new President they might start with a clean sheet. The President finally announced that there will be a special visit to Charing Cross Hospital on Saturday, October 15, at 2.30 p.m., by permission of the architect, Mr. Saxon Snell; and that the next meeting of the Association would take place on October 24, when Mr. E. Dockree would read a paper on "Photography as Applied to Architecture," illustrated by lantern views.

THE ARCHITECTURAL ASSOCIATION SCHOOL OF DESIGN:

OPENING MEETING OF SESSION.

THE opening meeting of the Architectural Association School of Design was held on Tuesday in the new premises of the Association, 18, Tufton-street, Westminster, S.W.

The President of the Association, Mr. E. Guy Dawber, who presided, said that they were to have the privilege of hearing that evening short addresses from Mr. Halsey Ricardo and Mr. G. H. Fellowes-Prynce. He would ask Mr. Ricardo to address the meeting first.

Mr. Ricardo said he meant to make the occasion an excuse for stringing together some well-worn platitudes, which, having stood the test of time, had almost earned a right to repetition. Like a nail in a fence, each man does a kindness who gives it a blow and helps to drive it home. In addressing a group of architectural students, it sounded a rather belated question to ask, "What do you mean by architecture?" and they would, with one accord, reply, "It is the result of building well and beautifully"; and that they had come here to be taught how to do this. The art of architecture was indeed the outcome of good building; and, as he believed, no building was ever erected that was thoroughly well built but what had a beauty proportionate to the purpose and to the

sincerity of the building. He held that beauty was the bloom and consecration of honest passionate endeavour, and that it was to be acquired that way and that way only. That, if they were to learn about beauty, it must be taught it through the paths of construction, of morals, and enthusiasm; or rather since it cannot really be taught, but evoked, strengthened, and developed, they must prepare themselves for this efflorescence, by discerned knowledge. At first blush it would seem that any knowledge was all to the good; that, as long as one was acquiring no matter what knowledge, the time was being well spent. But it was not so. One could not, to be sure, with, know everything, and, besides that, it was such a thing as intellectual indigestion from which we all suffer, in varying degrees. Knowledge, to be of any good to us, was only to be absorbed—it had to be assimilated, and the thing most generally interesting about a young man was not so much the quantity of knowledge that he possessed, but the quality of what he sheds of it. That he should devour voraciously and take more than he could incorporate was the sign of young, healthy, vigorous appetite, and no one could determine the capacity of his own digestion except by trial. But, for all that, as at the table food might be classed as digestible and indigestible with intermediate degrees of either in between, so knowledge might be classed, with a view to a student's digestion, as that which could be taught and that which you teach your son. Now it was the habit with food for the indigestible to be the most alluring—and with knowledge the parallel held good—for the most alluring subjects—such as beauty and proportion—were those they could not teach.

It may, and you must, cultivate your sense of beauty and proportion; but such education can only point out to you what has been done in past times under past conditions and attempt to explain why it has been accepted as beautiful ever since; it can't tell you what to do when your occasion comes. Each for yourself—you must build up your powers of appreciation, your faculty of discerning the spirit of a building and recognising the devotion and the passion there may be in it; each for yourselves must evolve your own canons of beauty; the more you know what has been done before, the more guidance you will get towards your own problem. But it is easy to dwell too long and too anxiously over the aesthetic side of your work—the man who is always considering what he may eat and what will agree with him is a valetudinarian, the strong man knows his powers and his limits, and doesn't think about them. Beauty is the unconscious bloom of thoughtful work, it is rightfully done—be it prose or verse, it is a matter of the moment, catch the surges of fashion and popular approval, and when day is past it has to suffer an added scorn from those who deem themselves its cajoled votaries. But if the fair form of your profession is to be taught, there is not the same restriction about the bones and muscles of it. That can most certainly be taught, and, moreover, they cannot be too well-known. They are your modes of expression. Art is the message from man to man. It matters not so much as art is concerned, what that mode of utterance may be. The painter flings his story on canvas; the sculptor dashes and wrings his life of the stone; the musician pours out his life in melody and rich texture of sound; the writer in prose, the poet in verse; it is a matter of the individual, not of art, in what guise the gospel shows itself. And as a musician uses sounds, so an architect uses bricks and stones as his methods of expressing the message in his hand. And, like the composer of a symphony, he has—to give outward form to his inspiration—to depend upon the co-operation of many hands for its realisation. The composer must be so much master of his craft that he knows what each of his performances will do, and writes passages for them, that when they contribute to build up the one harmonious whole, they still each may have the power—the opportunity to express their own individuality and emotion. And what is true of an orchestra is true, in a greater degree, of scaffolding. An architect must know how to design the parts of the whole, that each workman may see the sense of them and delight in his opportunity of collaboration. But, to this means knowing your work to the roots of it—your construction, your material, your men. You have to enlist their sympathy

you want to get the best out of them, and to this they must believe in you as one who only knows what he wants, but knows also one should go about to effect this. On his rest in the work he is doing for you depends fine flower of its effect. Your walls may be alive or dead-tired—it depends on you the way you have caused them to be dead. If they are alive and exhibiting every-where a personal touch and the evidence of mason's or bricklayer's fancy as well as plain, as regards features, as a barrack; but, your walling has been built in a mechanical, less way, the workman content with doing day's work, earning his day's wage and no care, careless of what his result may look like as it passes the standard of the foreman that building will look dull and bored, no matter what amount of enrichment (on the terms) you put upon it. Its weariness communicates itself to the spectator; not conscious of the reasons why, he feels that in an oppressive mass of labour there is no joy to tell, that nothing interesting has been done that it is only one more structure added to the tedious heap that already cumber the land. Architecture is so sensitive—it reflects fine shades and gleams of character, it is you the spirit in which the edifice was built, the temper of its occupant, of the moment it has suffered at previous hands, and its elements and time have been working in hand to co-ordinate and harmonise ravages. Interest in architecture is not a human—it is human. A fine design bespeaks a human spirit, and yet, until human passion played in and about the building, there is something wanting. Until it has been lived and shows the marks of kindly human hands, it is imperfect. Often the hands are hardly we can call respectful; additions are made later date, the symmetry is broken into mutilated, the scale and characters of features, doors, and windows are altered, yet the charm of the building remains. Very fact that the innovations—so regarded of the modulus of the existing building—so frankly and sincerely made, accepting altered conditions of life and its requirements, counts as a good mark; it forms a page in the book of history: the alterations not a sequel, they are actual human growth, they carry with them, and all over them, colour of the epoch in which they sprouted, the 'beauty,' as conceived by the original designer, is gone in a parous way, and, as for the proportion, that is a lost thing. But, granting the innovations are honestly, not wantonly, and that the same sincerity of purpose and thoroughness of workmanship is in them as in original building, most people will be apt say that the world is a gainer by this division of the aesthetic character of the building. The architecture of to-day is a living art all give evidence of its life by development. cannot stand still, it responds to the great of life, and, as these are incessant growths, must art be continually modifying itself, since the feelings of the time. New methods, facilities crowd upon us; new aims, new necessities appear with each fresh generation; we are here to embody these in permanent forms. Our personal equipment must be made knowledge of our materials—so that by of wise application we may make them grow and do more than they as yet have done and intimate knowledge of construction—so we may avail ourselves of all the forces of late have sprung up around us, and also enabled to recognise and wrest to our purpose capabilities of yet newer ones when they appear. It is want of this training that puts present in an inferior position (in the eyes of the public, and very rightly so) to the past; he at least has had the sense to learn he could about bricks, steel, and concrete, the mighty spans of his railway arches, flights of his bridges across the rivers, the docks and sea-walls are the real important manifestations of living architecture in the 19th century. He has advanced the possibility of building by force of hard sense, experiment, and mathematics. Brunelleschi his dome at Florence, Sir Christopher Wren his dome in London on these terms, and New Yorkers are erecting their sky-scrapers on these terms. Neither Brunelleschi nor Wren had what we should call an architect's feeling; neither of them set much value on it, or cared to be bothered with it, but their intuitive sense in the great problems they

had to grapple carried them] securely through the smaller questions of detail; they knew enough to inspire their coadjutors to play up to them. I will only, at this time, point out to you, for your own reflection, the general statement that good detail goes with good construction, and where you detect bad detail you will discover heartless or ignorant construction. And how little excuse there is for this ignorance. The problems of construction are the fascinations of architecture as much as the problems of planning. Both are the arts of contrivance; and the art of architecture was of all the Arts (with a capital A) the last to appear amongst her sisters, since she was the outcome of so many balanced forces and so many cultivated virtues—compared to her simpler-natured sisters. We are the votaries of this goddess; in imitation of the delicately-poised equilibrium that constitutes her cognisance we rear our buildings, and in our hearts we pray that she may look down upon our efforts and irradiate them with the smile of her approval."

Mr. Fellowes-Pryne then addressed the meeting. He said he sometimes wondered how far the words that are spoken on such an occasion as this influence or help those to whom they are spoken; or whether, like many sermons that are preached, their effect ceases on leaving the door of the place in which they are spoken. Yet he would fain hope that the many words of advice—words that are often the outcome of matured experience and well-seasoned thought—that had been spoken before the Association and at the Institute year after year, had not always been cast aside by the student hearers as mere platitudes or pleasant words strung together to tickle the ears of the audience for a little while. No; he was sure this was not the case with the more serious student who had the welfare of his studies really at heart. The seed had not always been cast on waste ground. Nay, more, such delightful addresses to students as were given at the Institute by Mr. Aston Webb he was sure could be read and re-read with advantage and encouragement, not only by the younger students, but by those in later life. Indeed, with all such addresses it was often the case that the thoughts and suggestions they contained would not be fully realised or appreciated at the time they were heard, but reading after having heard them spoken was much more likely to leave an indelible impression as to the more important points. In again addressing the A.A. Class of Design, one felt like addressing old friends, for although the faces were different—and those to whom he had previously spoken were now well launched on their professional career—the enthusiasm and *esprit de corps*, he trusted, remained the same as ever, and would always continue while the A.A. exists; for was it not enthusiasm that was the very life-blood of the Association? What, in its earlier days, would the A.A. have done without the warm enthusiasm of its members? How would this very Class of Design have fared if it had not been for the enthusiastic support of those who were seeking for knowledge? "You who now have such well-served feasts of architectural education and other opportunities of study can little realise the difficulties which beset the student of thirty or even twenty-five years ago. Those were days in which one's studies were the outcome of real self-help. Yes, I'll be bound to say that no greater enthusiasm exists now than then. But the great question is, with all these advantages and opportunities, what are you going to make of them? Are we in the future, as in the past, to see our streets burdened and disfigured with such designs as your President rightly complained of in his very interesting address last week?" The result of the great and well-organised Architectural School that has arisen in our midst should, in a very few years, make itself felt, not only in Great Britain, but in every part of the Empire. Those of you who have been members of this class of design, or who have passed through the day-school, must, to some extent, realise the difficulties, as well as the capabilities and the pleasures of such a profession as ours; they must also know by this time that it is no easy-going profession that they have chosen, but one that demands, if it is to be successful in the highest sense, continuous study and hard work. But to those who have that priceless gift of enthusiasm and real love for our great

Art, the study and hard work will become a real pleasure. Remember Sir Joshua Reynolds's words:—"If you have great talent, industry will improve them. If you have but moderate abilities, industry will supply their deficiencies. Nothing is denied to well-directed labour, nothing is to be obtained without it."

From much of the work that was done during the last session one could not but see the great improvement that was taking place under the systematic training and the able guidance of the day-school masters. Of course, the one for in systematic and academic training was that they might be inclined to get into a somewhat narrow groove of study and be perhaps led to think that only such and such a style of work—i.e., the style that may for the time be in fashion or favoured by this or that master—was correct, and all else was unworthy of study. Now, nothing to his mind could be more degrading and disastrous to the highest and noblest view of their great art; and, from the very commencement of their studies, he did most strongly advise them to be as catholic and wide in their views as possible. "Do try and look at architecture—as indeed all art—in the broadest sense possible. Avoid, as far as possible, thinking in styles. I don't mean for a moment that you should not study your orders and the gradual development of styles in all periods, and gain all the knowledge you can as to the reasons and causes of such development. This, of course, is all a part of the essential knowledge of an educated architect. But, in your study of old and new buildings, try and find out the why and wherefore of things—first in the plan, next in the effect that the plan has upon the elevations, or *vice versa*. Ask yourself:—1st. Why you admire this or that building? 2nd. What are the leading lines or details that make it beautiful? 3rd. And, perhaps, above all, what is it that makes the proportions good? 4th. How does the detail at different stages and heights affect that proportion? These and similar questions are those the answering of which, wholly independent of style, will help more than any other in the intellectual study of any good building. When once you have satisfied your own mind as to the reasons that go to make up a thing of beauty, if possible, note them down at once in your sketch-book, and, as far as you can, measure and figure the details that seem to help most in giving beauty and proportion to the design you admire. This kind of analytical study you will find of immense use in design. The notes in your sketch-book may not be very pictorial or interesting to others, but will gradually form a regular storehouse of information to yourself. And, while speaking of sketching, let me advise you to always have a small sketch-book with you for making notes and small sketches in: I don't mean only when you go out intending to sketch, but always—on your walks, your bicycle rides, in fact in your every-day work—for, if you keep your eyes open, it is wonderful what one sees that is worth recording, either by notes or sketches. There are some things and sayings that stick to one's mind throughout life, and the advice of the first architect I worked with was, 'Whatever you do, don't go through the world with your eyes shut, as more than half the people in the world do.'

There was another point on which he should like to say a few words, and that was the practical side of their work. The fascination of sketching, and thinking, and setting out schemes of design on a drawing-board was great; but, as a preliminary part of their education, it was equally, if not more, important that they should thoroughly grasp the practical side of their work. Now, he was sorry to say so, but over and over again he had found men and pupils who fought shy of often visiting the actual works while in progress. As one said to him a short time ago, "I don't care for mixing up with a lot of workmen." And another, "I don't see the good of watching a whole lot of concrete put in."

"My dear young friends, for goodness' sake don't let such nonsense enter your heads, or if there is one here who thinks thus and adheres to such thoughts, let him give up the profession; he evidently doesn't think it worthy of him, and he is certainly not worthy of the profession. Some practical experience is essential, and the sooner you get it, the better for yourselves and your future work and clients. Put off your kid gloves—aye, and your coat if necessary—and take every opportunity of

getting on any works you can while in progress; watch each stage of the work carefully and intelligently; get on friendly terms with the foreman and the men, and don't be ashamed to ask for information. The men like to have interest taken in their work, and you will gain invaluable information by carefully watching the work on bench or hanker. Most of the men I have come across will be only too glad to tell you all you want to know. Personally, I believe that it would do most of us all the good in the world to be put under the care of a good clerk of works on a large job for a year. It would knock some of the pride and nonsense out of us, and make us realise that architecture does not consist solely in making pretty drawings of sometimes impossible buildings. I have nearly always found the greatest kindness and civility from workmen in all trades, and I sometimes feel I ought to pay a premium for the amount of practical knowledge they have given me on various occasions. There are lessons to be learnt on a building in progress that no amount of book-work or diagrams will teach you. Again, the enormous advantage in practical experience to an architect is at once seen in his drawings and designs. It is this want of practical knowledge that so often makes the progress of otherwise capable pupils and draughtsmen so disappointing. To give you one personal example of how I have found some experience in carpentry useful:—The opening of a certain church was to take place on the following day, and the first service was at eight o'clock in the morning. Things were much behind, and, when I arrived, I found that some unpleasantness had arisen with the joiners, who had been drinking with the foreman, and they lounged about, refusing to work after six o'clock. I tried to persuade, but only obtained the help of one good man. It was of the utmost importance that some of the east-end woodwork should be properly fitted in position. At seven o'clock I took off my coat and, to the astonishment of the men present, set to work with horrowed tools. The moral effect was excellent. At nine o'clock some of the better men came back to work, and by two o'clock in the morning I had the satisfaction of seeing the work completed. I can assure you the much-abused British workman respects the man who not only orders the work to be done, but can tell him how to do it.

Now, in conclusion, having treated with the practical side, let us for a moment look on another and, perhaps, more pleasurable side of our art. There is that happy social side which has made its mark on the lives and work of so many members of the A.A. in past years. Do all you can to keep up that social aspect of the work. Encourage, as far as possible, that friendly intercourse with your fellow-students—friendly criticism of each other's designs will be of the greatest possible value, and friendships made now, and kept up and cemented in after-life, will in future years be cherished as an added pleasure to your professional work. Last, but not least, throughout your work let your aims be high. Think of the greatness of the art which you have chosen for your profession. An art that is at once noble and ennobling to those who view it rightly. It is an art that more than any other marks the character and history of nations. Surely, the advancement of such an art is worth living and working for. Let my last words be those of George Herchert:—

'Pitch thy behaviour low, thy projects high;
So shall thou humble and magnanimous be.
Sink not in spirit; who smeth at the sky
Shoots higher much than he who means a tree.'

The President said they had had two delightful addresses, and there was much in them that one would be glad to read when they were printed. In Mr. Ricardo's beautifully-expressed paper one thing was emphasised, and that was that there could be no good architecture without a sound, practical knowledge, and he (the speaker) hoped they would, as students, impress that on their minds. They might be walking in the country where they might see an old wayside cottage which was built of brick or stone, which would impress them far more, perhaps, than the modern, garish villa next door covered with ornament. They might ask themselves why that was. He thought the reason was that the people who built the old cottage understood the capabilities of the materials they were using, and he should like students to remember that without practical knowledge it was impossible to make a good

building. As Mr. Prynne had said, they should use every opportunity of getting on to buildings in progress, and into shops, in order to learn everyday practical things. For instance, if they visited a stone quarry, they should go right down inside it, and see how the stone was got out, how it was worked, the tools used, how it was cut, and whether it was fine or coarse grained—before they could properly design in that material, and so with others. As Mr. Prynne said, if they could get on a good building with a clerk of works, and accustom themselves to seeing the work through from beginning to end, it would be of inestimable advantage to them. They could never design until they knew how a building was put together and constructed. Good construction helped good design. Then as to what Mr. Ricardo said about mouldings and details, he (the speaker) thought with him that students would do well to leave such trivialities alone—they were the mere trimmings of a building—and study mass and dignity in design. The design without detail would speak for itself, and would be good or bad architecture without detail. It was very good of Messrs. Ricardo and Prynne to have come among them that evening, and he was glad to see such a good audience.

On the motion of the Chairman a very hearty vote of thanks was then accorded to Messrs. Halsey Ricardo, and Fellowes-Prynne for their remarks.

Mr. H. Tanner, jun., announced that there were two classes the Association would be glad if some students could find time to attend, *i.e.*, classes in ornamental leadwork and stonework at the L.C.C. Technical Institute in Vincent-square, Westminster. They were poorly attended, and the L.C.C. thought of discontinuing them unless about fifteen or eighteen students could be found to attend them. It would be a great pity to let such useful classes drop.

The meeting then terminated.

UNIVERSITY EXTENSION GUILD.

The annual reunion of the University Extension Guild was held at the University of London, South Kensington, on Tuesday evening, under the chairmanship of Sir Arthur Rücker, F.R.S. (Principal of the University), when addresses were given by Dr. Emil Reich and Mr. Hillaire Belloc, B.A., descriptive of their lectures to be delivered in the Michaelmas term.

The Chairman, in opening the meeting, congratulated those who had worked so hard for the Guild on the success which had attended their efforts. It was an answer to those who doubted at the commencement that they could get such an attendance at a course of lectures which were not merely ordinary popular lectures, but were a system of lectures extending over three years. This was the second year's lectures of the three years' course. Last year the history of antiquity was dealt with; this year they were to hear a great deal of the time between the decline of the Roman Empire and the Reformation, and next year the subject of more modern history would be dealt with. It would be thus possible for those who could attend to hear a continuous course of history extending over almost the whole range of time known to man.

Medieval History.

Dr. Emil Reich delivered an address introductory to his course of lectures on "Medieval History," and said that he intended to give an account of the Carolingian Empire, the Byzantine Empire, and of the great Popes of the Middle Ages; of the foundation of the great orders and the Crusades, and to devote three lectures to mediæval thought or scholastics, mediæval art, Gothic architecture, and mediæval life, both home and public. The Middle Ages, he held, had been suffering from a variety of causes, misleading public judgment. In the first place the public generally identified the Middle Ages with everything dark, unprogressive and benighted. The average man thought that they were full of tortures, witch trials, religious persecutions and the like, but as a matter of fact all these evils were infinitely more frequent in the XVth and XVIIth century than in the Middle Ages. They owed an enormous debt to the Middle Ages, which gave them a most magnificent specimen of a novel art—Gothic architecture. In the XVIIIth century they laughed at

Gothic architecture, and called it crude, rude, but they had long learned to think differently, and no modern man could see exquisite mediæval churches without that the Middle Ages for that art. It might be said these people had no literature and science, but their souls went into beautiful buildings.

Mr. Hillaire Belloc, who will deliver lectures during the term on "The History of Mediæval Town," said his was but one of the subject which Dr. Reich had put before them, but it was a subject which attracted him from his boyhood, and he tried to show why it still continued to attract. A matter which would soon be debated whether certain physical things or great philosophies had had more effect on the history of civilisation, but when it was debated no conclusion would be arrived at because they did not compare the two things. When that decision was entered into people would rush in and that religion was more important than anything else. Although for many years they had held that the Middle Ages were ourselves, and it was their interest. When a man said Greece or Rome was nearer to him than the Middle Ages—he meant a man who knew the Middle Ages—then he would say, "You saying something up in the air." Give a man a slave and he would not know why he with him, but a Greek or a Roman would know where to sell him and how to treat him. In the Middle Ages there were capitalists and prisoners of war, but there was no slavery; the men of the Middle Ages were ours. When the Roman Empire fell the barbarians did not come to destroy, and the great city of Paris remained for 130 years. If they had they would find that there was no great change after the first invasion. They gradually declined. Then came the invasion of the Saracens, but Western Europe was not that with difficulty. At the beginning of the Xth century Europe was like a man who had almost lost his memory, and wondered how he had survived. At the end of the XIth century, by a process no one could understand, but which was more wonderful than the Renaissance, there came an awakening of Europe. There came Gregory VII., the Crusades, and that extraordinary phenomenon the Normans. Just as they made steel by adding a small percentage of carbon to iron, so a small percentage of Scandinavian blood added to the blood of the Roman people made the Norman. Like all things eccentric could not last—he doubted if it lasted 130 years, but while it was there it organised and schooled Europe. It actually made a land measure, and the Normans put into the air vague institutions of which came a true feudal system, was the awakening of Europe. There appeared with the beginning of the XIIth century an ideal which lasted 300 years, and that ideal was made by men like ourselves. There had been no change in our race; there had been no influx into our blood since there had not been even an admixture of blood since then. We were the same people we were ourselves in the Middle Ages. Architecture was not copied from elsewhere and our social system was organised on a system which had evolved and copied from now. And then came the great tragedy of history. He was sorry that Greek art declined and was heartbroken to hear that the Stoic last became Mystics; but much more sad to him to read how this great dream of the Xth century went down. Some attributed it to black death, and others to the Catholic Church, but they might discuss it again and still be no nearer the truth. It was true, was supposed during the term to tell them it fell, but in truth he did not know, and would only be able to sketch out the approximate causes of its failure. He could only tell them that terrible failure came, but not why it came. But, with regard to that delightful time, they had not only the documents of the architecture, but many stories which illustrated the life of that period. And in dealing with this period he continually asked himself as if he was living in it. In that time in Western Europe there were two principal forms of social units—the manor or village and the town. In the course of the lectures he was to deliver was going to show how the mediæval town arose from Rome, and should try to describe

interior organisation and how it became a centre of great activity. He should deal with such towns as London, Paris, Rheims, Lisbury, Chester, and others, as examples, and then he would come in the last lecture to discuss why the ideal fell, but that could not be answered.

THE THAMES AND RIVER-SIDE HOUSES.

FROM A CORRESPONDENT. THE August number of the Strand Magazine contains the answers of many great artists to a question, "What is the finest view in the kingdom?"

One replies that his favourite view used to be that of the Thames at Stratley, now ruined by the modern buildings there. Now, why could that be so unfortunately true? No one could assert that a building—even a large building—need spoil a landscape. Windsor Castle, for example, is the chief charm of the view from the river near it. To take the other extreme, a rustic cottage is the artist's delight. Why should that which lies between these two, a gentleman's villa, be so often a blot on the landscape? Is it not because suitability to a place has not been considered? A dweller in Kensington or Fitzjohn's Avenue wishes for a country house in one nook which has captivated him by its tranquil beauty, and he orders in the style of his town house, so spoiling the very charm that has attracted him.

Wordsworth, who gave so much thought as well as time to laying out Lady Beaumont's grounds for her, says that the fundamental principle is that "the house should belong to the country, and not the country be an appendage to the house."

It would be a real public benefit if those who are going to build Thames-side houses would take them on the further side of their land, from the river, and this in most cases would be an improvement to the house. Not only will the higher ground be drier, but also the view of a stream between its banks is generally more attractive than a view which contains the flat but the opposite bank, with a floor of water.

This suitability, which is an essential part of any garden, should extend of course to the grounds well as the house. In towns, where a garden is surrounded with buildings, many people mire geometrical beds with blooms that imitate mosaic, but a glance shows how little they fit in to a country landscape. Long, straight lines that seem to flow into the stream—these are not Nature suggest them by her statelike beds and bamboo-like grasses? Yet many parian gardeners, instead of cultivating this rampant growth, use the sickle and mowing-machine to destroy it, and then place painted boards in a row on the bare, hard edge. If they could view their riverside gardens from a boat, at a little distance, and consider them as part of a landscape, they would soon decide that a different treatment was wanted.

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the summer recess was held on Tuesday in the County Hall, Spring-gardens, W., Mr. J. Williams Benn, M.P., presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 1,054*l.* and 1,581*l.* for the purchase of land; Bermondsey Borough Council 10,000*l.* for the erection of working-class dwellings; Camberwell Borough Council, 5,500*l.* for the purchase of leasehold interests in depôts; Poplar Borough Council, 1,472*l.* for purchase of dust-vans; St. Marylebone Guardians, 4,000*l.* for drainage works at the primary; Shoreditch Board of Guardians, 100*l.* for water-supply purposes at the work-house; Southwark Borough Council, 14,000*l.* for purchase of Greenmore Wharf, Bankside, to be used as a depôt; Woolwich Borough Council, 500*l.* for contribution towards the cost of acquiring Eltham Park. Sanction was also given to the borrowing by Hackney Borough Council of 5,339*l.* for paving works; and to Eppingdon Borough Council, of 2,587*l.* for paving works.

Improvements: Central-street.—The following recommendation of the Improvements Committee was agreed to:—

That the estimate of 5,875*l.*, submitted by the Finance Committee, be approved; that to enable the Council to complete satisfactorily the widening of

Central-street now being undertaken under the powers conferred by the London County Council (General Powers) Act, 1901, and in accordance with the application of the Council of the Metropolitan Borough of Finsbury, a contribution be made on the usual conditions of half the net cost of the widening of existing and the formation of new streets on the eastern side of Central-street, proposed to be carried out by the Borough Council by arrangement with the Ironmongers' Company, in accordance with the plan presented to the Improvements Committee on July 13, 1904; provided, however, (a) that if the total net cost exceed 11,750*l.*, the Council's contribution shall be limited to 5,875*l.*; (b) that in the carrying out of the improvement no departure whatever be made from the approved plan, except with the previous sanction of the Council; and (c) that the Ironmongers' Company agree to provide other land for the purposes of the L.C.C. school in place of that taken for the improvement, and to bear the cost of the necessary re-arrangement of the boundary walls, out-buildings, etc., and also carry out the proposed arrangement with the Borough Council for the sale of land for the provision thereon of re-housing accommodation for the persons of the labouring class to be displaced by the execution of the company's scheme."

Health Asylum, Bexley.—The following recommendation of the Asylums Committee was agreed to:—

"That, subject to the approval of the necessary plans by the Home Secretary, the estimate (No. 4,248) of 16,250*l.*, submitted by the Finance Committee, for the erection and equipment of a hospital villa on the male side of the Health Asylum, Bexley, be approved; and that the expenditure for the purpose of a sum not exceeding that amount be sanctioned."

Tramway Works.—On the recommendation of the Highways Committee it was agreed:—

"That the estimate of 1,000*l.* submitted by the Finance Committee, be approved; and that expenditure, on capital account, not exceeding that amount, be authorised in connexion with the purchase by the Council of the freehold interests in a portion of the Queen's-road, Battersea, tramways depot, for the erection thereon of a sub-station for the electrical working of a portion of the London County Council Tramways.

"That the freehold interests of the trustees of the Stockwell Orphanage in the proportion of the Council's tramways depot in Queen's-road, Battersea, referred to in the foregoing resolution, be acquired for the sum of 825*l.*

"That Messrs. H. Lovatt, Limited, be allowed to sub-let to Messrs. Beaven and Sons, London (or to such other firm as may be approved by the architect), the work of plumbing, painting, and glazing included in several contracts being carried out by Messrs. Lovatt for the Council, in connexion with the Greenwich electricity generating station and sub-station.

"That the seal of the Council be affixed to any necessary documents in connexion with the acquisition by the Council of the freehold and leasehold interests in the property known as No. 32, Rivington-street, Old-street, which has been acquired as a site for the erection of a sub-station for the electrical working of portions of the Council's (Northern) Tramways."

Housing.—The Housing of the Working-classes Committee submitted the following statement of new dwellings completed during the summer recess, and opened for occupation:—

Table with 5 columns: Name of Estate and Buildings, One Room, Two Rooms, Three Rooms, Four Rooms, and [Number of persons provided for. Rows include Hughes-fields, Deptford; Drake-buildings; Ropemaker's-fields, Wapping; Brightonsea-buildings; Preston's-road, Poplar; Hudson-buildings; Quebec-buildings; Winnipeg-buildings; Leroy-street, Bermondsey; Barnaby-buildings (part); and Total.

Drake-buildings have been erected on a plot of surplus land acquired under the Hughes-fields scheme, 1885, and are intended to provide accommodation for re-housing 214 persons of the working-class to be displaced by the erection of an electricity generating-station at Greenwich in connexion with the Council's tramways. Brightonsea-buildings have been built in part satisfaction of the obligation resting upon the Council for re-housing the persons to be displaced on the north side of the river Thames by the construction of Rotherhithe tunnel. The erection of Hindson, Quebec, and Winnipeg-buildings completes the provision of the accommodation required on the Preston's-road and Norfolk-street sites for persons to be displaced by the clearance of the areas included in the Burford's-court, etc., improvement scheme, 1899, and, also, by arrangement with the late School Board for London, for satisfying the obligation which rested upon that authority for providing accommodation in lieu of that destroyed by

it in various parts of the county over a number of years. Barnaby-buildings are provided for the purpose of re-housing persons to be displaced by the carrying out of the Long-lane and Tabard-street improvement.

Boswell's London House.—Upon the recommendation of the Local Government, Records and Museums Committee, it was agreed that a memorial tablet should be affixed at No. 56, Great Queen-street, to commemorate the residence there of James Boswell.

Theatres, etc.—The Theatres and Music Halls Committee reported that plans for the following, showing alterations, etc., to licensed premises, had been dealt with during the recess:—

- Beelstein Hall, Wigmore-street—Showing the provision of a private room for the box-office keeper. National Skating Palace, Argyl-street—Proposal to meet one of the Council's suggestions for the improvement of the premises. All Saints' Institute, Priory-road, Lambeth—Showing seating arrangements. Daly's Theatre—Proposals to meet certain requirements of the Council. Excelsior Baths, Bethnal Green—Showing alterations to the seating and flooring. Bus of Court Mission, Drury-lane—Proposal to substitute fire-proof plaster doors for the existing iron doors. Lectures Hall, Greenwich—Provision of ante-room. London Exhibitions, Earl's-court—Formation of a cinematograph enclosure in the Panorama-buildings, Western gardens. Lyric Theatre—Re-arrangement of pit seating. Royal Court Theatre—Provision of a new transformer chamber. Bermondsey Town Hall—Bazaar from November 1 to 5, 1904.

Plans relating to certain work at the following buildings were, on the recommendation of the same Committee, passed on conditions:—

- Clarendon Hotel, Hammersmith-broadway. Forest Hill Baths. Fulfords, Limited, Nos. 207 and 209, Regent-street. Headquarters of the South Middlesex Volunteer Rifles, Fulham. King's Assembly-rooms, Cottage-grove, Bow-road. La Graciera, Nos. 29 and 30, High Holborn. London Coliseum. London Exhibitions. Long's Hotel, New Bond-street. Prince's Restaurant, Piccadilly. Sportsbank Hall, Catford. "Ye Plough," Clapham Junction.

Motor Omnibuses.—Mr. Baker, in reply to several questions, said that the working of motor-omnibuses as tried in several provincial towns, did not lead him to believe that if they were introduced in the London streets they would form any formidable rival to the Council's electric tramways. In the event, however, of such motor omnibuses being put on the Council's based tramway routes, steps would be taken to see whether motors could not be

used on the horse-trams so as to compete with the opposition.

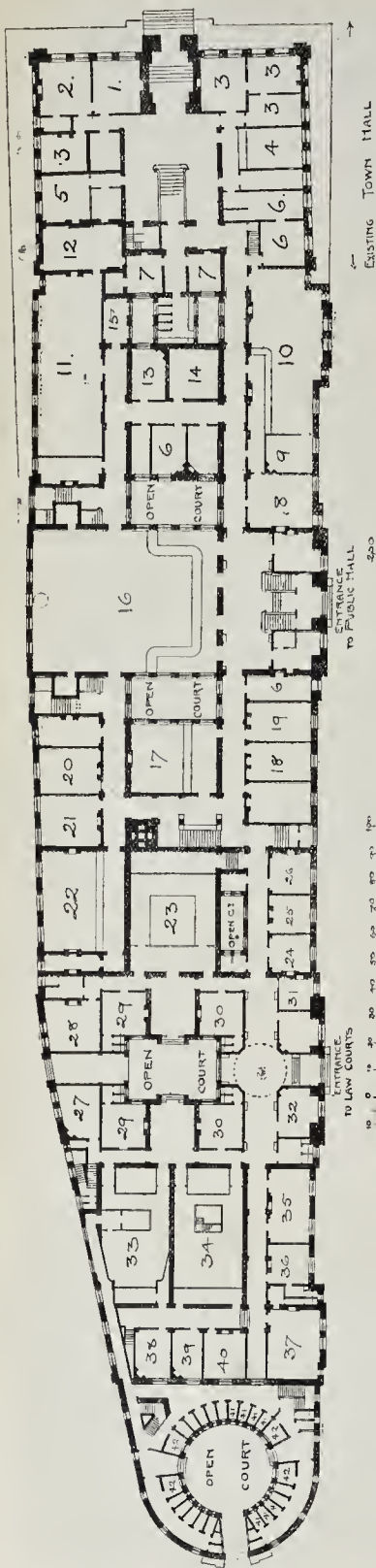
Traction Engines.—On the report of the Public Control Committee, Mr. Beachcroft asked the Chairman when the conference on the subject of the use of traction engines in London thoroughfares was likely to be held.

Mr. Harben replied that the conference had been fixed for Friday, November 18.

Mr. Beachcroft asked whether in that case, assuming that the conference came to the conclusion that legislation was required, it would not be too late to initiate any action in the coming Parliamentary session.

Mr. Harben: Undoubtedly it will be too late for this session, but it will be quite impracticable to call the conference at an earlier date.

Inspection of Theatres.—On the motion of Mr. Dolman, the Theatres and Music Halls Committee were instructed to present a half-yearly return as to the inspection of places of entertainment by the Council's officers, showing the number and nature of the offences reported.



Scale of Feet
 Competition Design for Hull Town Hall, Plans.

- REFERENCES:—
- 12. Plan Room; Room.
 - 13. Contractors' Room.
 - 14. Post Office.
 - 15. Foreman's Room.
 - 16. Rates Office.
 - 17. Pay Office.
 - 18. City Engineer's Office.
 - 19. City Treasurer's Office.
 - 20. Electrical Engineer's Office.
 - 21. Assistant.
 - 22. General Office.
 - 23. County Court.
 - 24. Solicitors.
 - 25. Judge's Room.
 - 26. Judge's Room.
 - 27. Police.
 - 28. Solicitors.
 - 29. Police.
 - 30. Police.
 - 31. Police.
 - 32. Police.
 - 33. Police.
 - 34. Sessions Court.
 - 35. Grand Jury.
 - 36. Judge's Room.
 - 37. Magistrate's Room.
 - 38. Magistrate's Clerk.
 - 39. Police.
 - 40. Police.
 - 41. Police.
 - 42. Police.
 - 43. Warders.

Bethlem Hospital.—Mr. Gilbert moves that, in order to provide South London with a necessary open space, it be referred to the Parks and Open Spaces Committee to consider and report as to the acquisition of the Bethlem Hospital and grounds for a park open space, and whether, as it is the property of the Bridge House Estates of the City Corporation, it can be acquired by means of exchange of other land, in or outside the Corporation, or by any other suitable method.

This was agreed to without discussion. *Westminster Bridge Trams.*—On the motion of Mr. Gilbert, it was also agreed that, in order to facilitate the traffic requirements of South London and the general requirements of the High Committee he instructed to consider and report to the Council with reference to the proposal in the next session of Parliament of a scheme for joining the two tramway termini at Blackfriars-bridge and Westminster-bridge by means of a tramway constructed across the bridges and along the Victoria-embankment in order to provide a continuous circular route which the blocks in Blackfriars-road, Westminster-bridge-road might be obviated. The Council then adjourned.

Illustrations.

A DESIGN FOR STAINED GLASS

THIS is a design made by Mr. A. H. Wooller, a student of the Royal College of Art. The four panels intended for the windows on staircase of a country house, and the subjects chosen are meant to illustrate in some measure the joys of a life in the country. The right-hand upper panel on the sheet, and the left-hand lower one, should more properly come side by side, as they belong to the same subject, and illustrate Keats's line—

"Happy in beauty, life, and love, and everything suggesting the playful and lighthearted side of life away from towns. The first and last panels illustrating poetry and music, suggest deeper and more emotional side.

These two last-named figures have been subjects of some interesting experiments in silver stain and its application in the production of white and coloured glasses.

DESIGN FOR THE EXTENSION OF HULL TOWN HALL.

This design, by Mr. John Murray, was submitted in the recent competition, the conditions of which stipulated, among other things, that the old building was to be retained, there was to be no building over the prison cells, and the total cost was to be 100,000.

The leading ideas in this scheme were to retain, with slight alteration, the existing building; to keep the new principal entrance facing Alfred Gelder-street on two lofty floors carried along level with the old offices; and to carry through lineable the principal zonal architectural features.

The law courts were placed upon the ground floor, with the prison cells at the western end of the site for the convenience of transferring prisoners from the gaol, which is nearly opposite thereto.

In order to provide the requisite accommodation, an additional story was arranged facing Anne-street.

The elevation facing Alfred Gelder-street was treated with two main pavilions, under which were placed the entrances to the law courts and to the public hall, rates office, etc.

The architectural treatment was intended to harmonise with the old building and to do so with a degree of restrained monumental dignity and solidity, as the architect conceived the best adapted for this problem; and to satisfy modern public ideas of civic splendour.

NEW OFFICES FOR THE BRISTOL GAS COMPANY.

THE business of the Bristol Gas Company having outgrown the accommodation in its existing offices, which are in an inconvenient situation and difficult of access by the public, has been determined to erect new buildings in a conspicuous position on a site adjoining Colston Hall and in the principal business centre of the city.

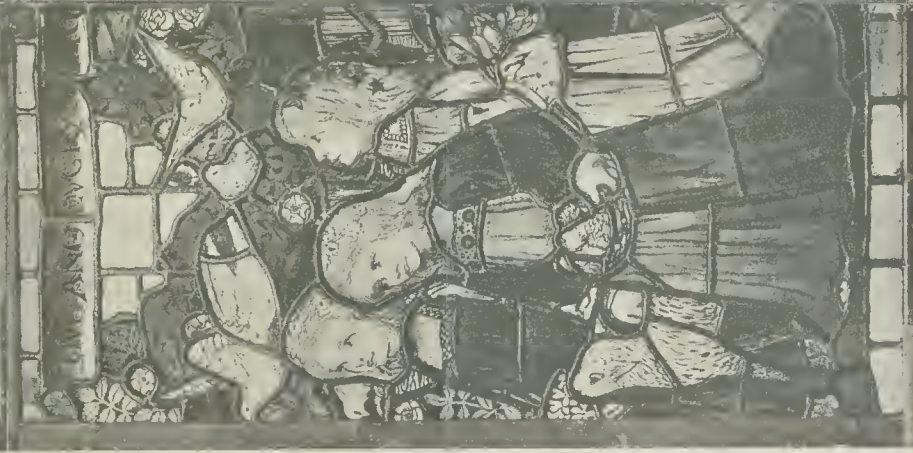
The accommodation provided comprises the basement floor, storage for gas stoves



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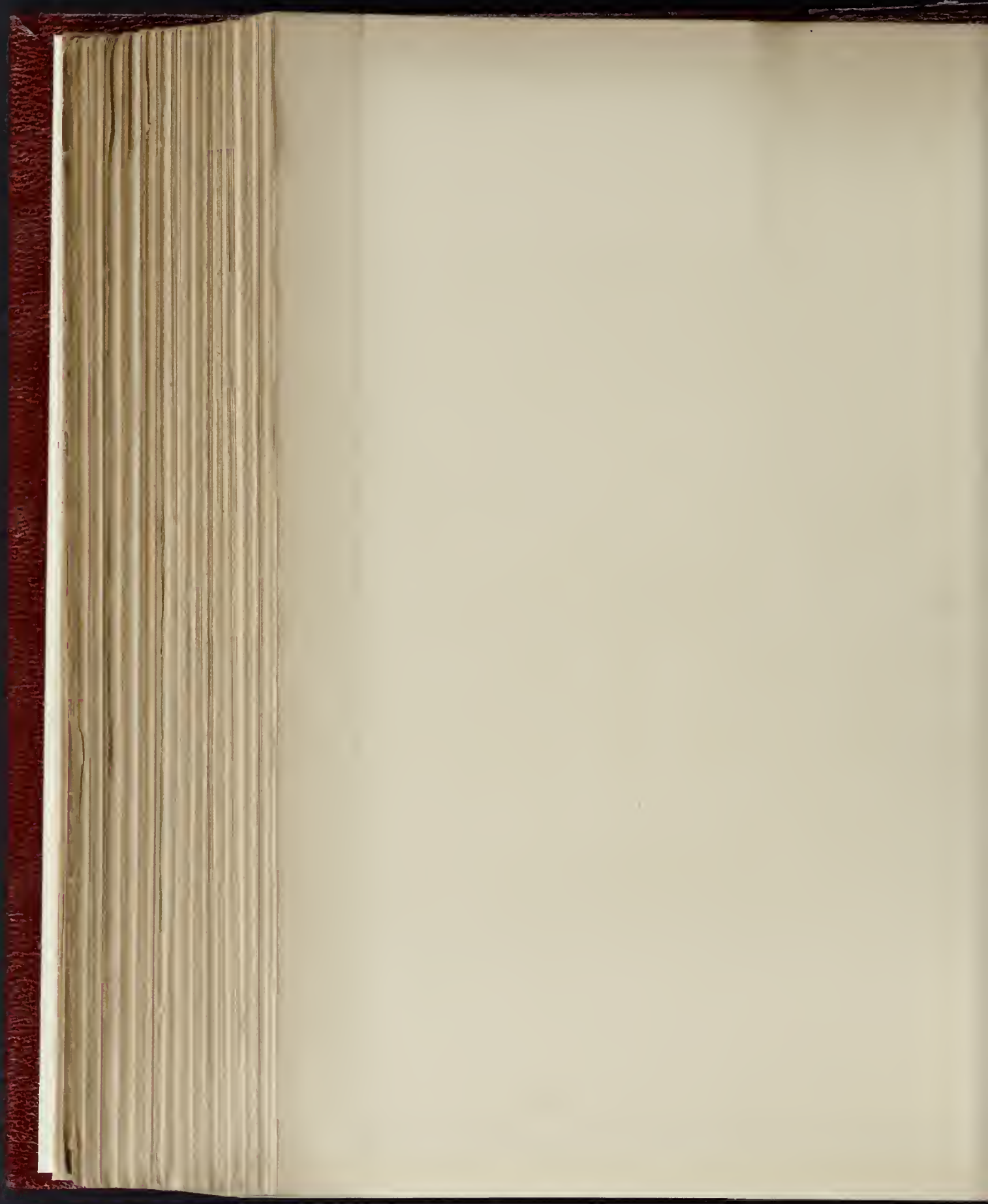
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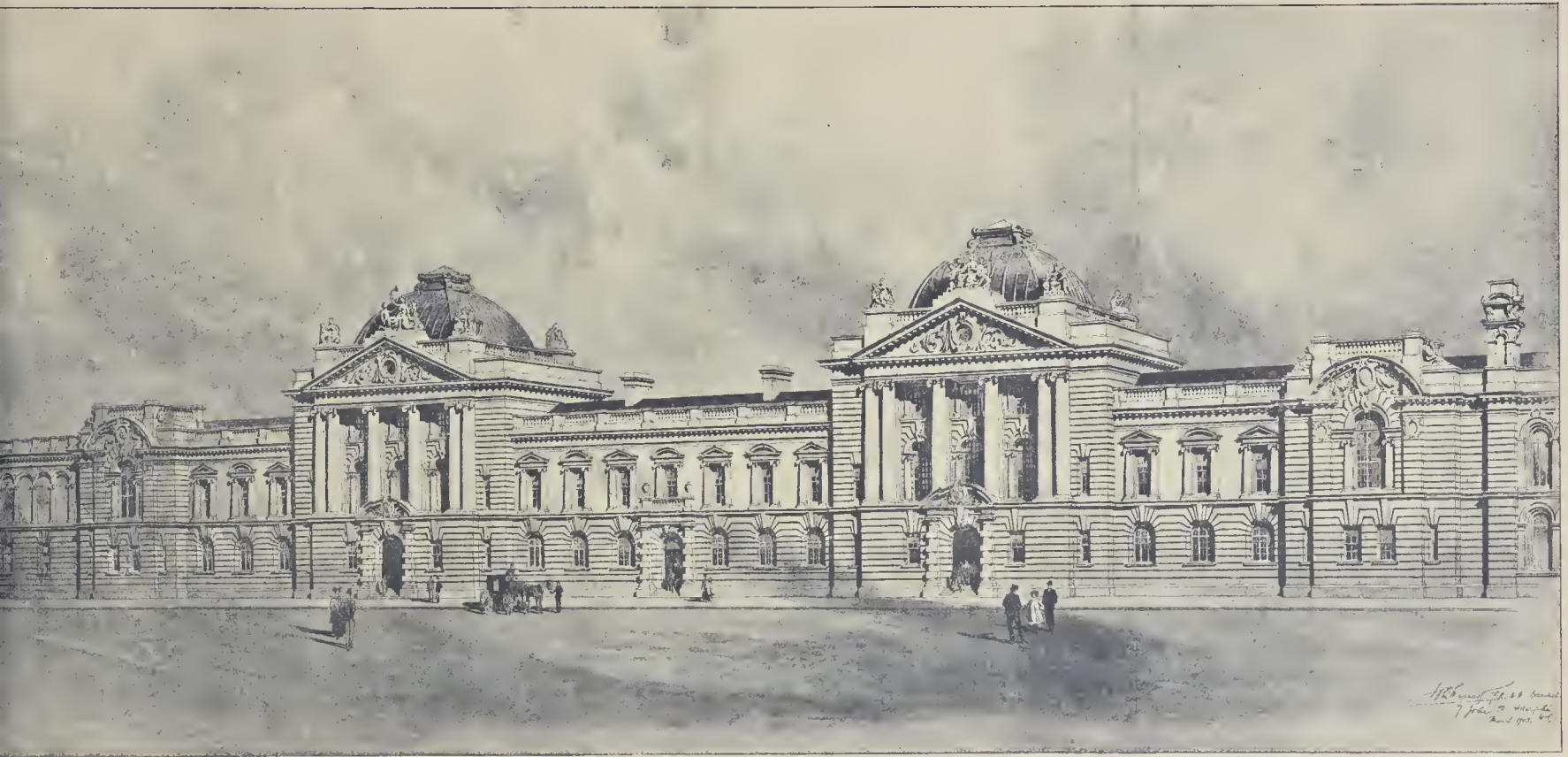
4.

NEW PHOTO-ENGRAVING CO. 121 N. 4th St. EAST - MINNAPOLIS STREET PETERSBURG, VA.

DESIGN FOR STAINED GLASS.—By MR. HORACE WOOLLER



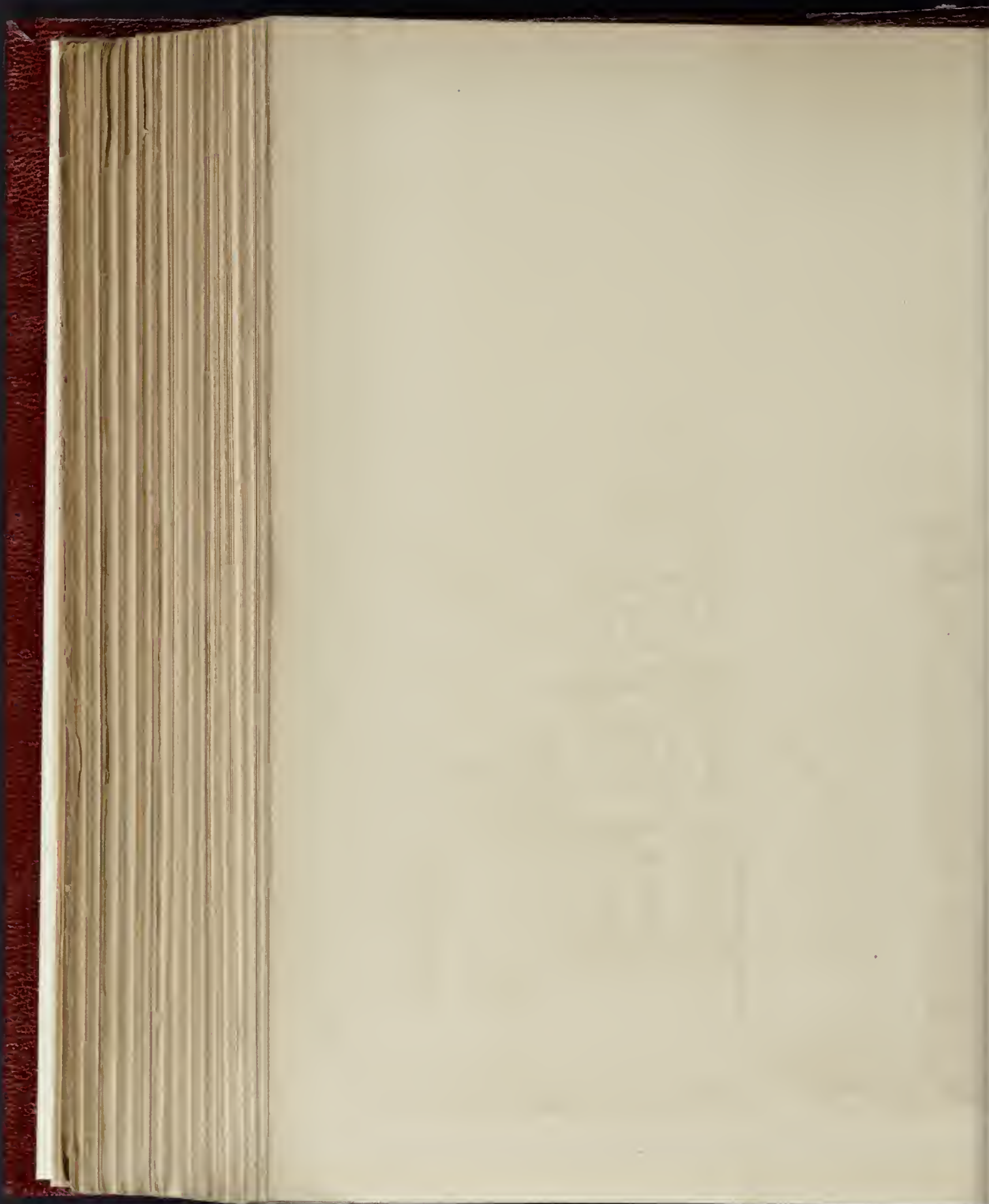
THE BUILDER, OCTOBER 8, 1904.



*1/20 scale. Pl. 10. Overall
7 ft. 10 in. high
and 100 ft. long*

INK PHOTO; SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

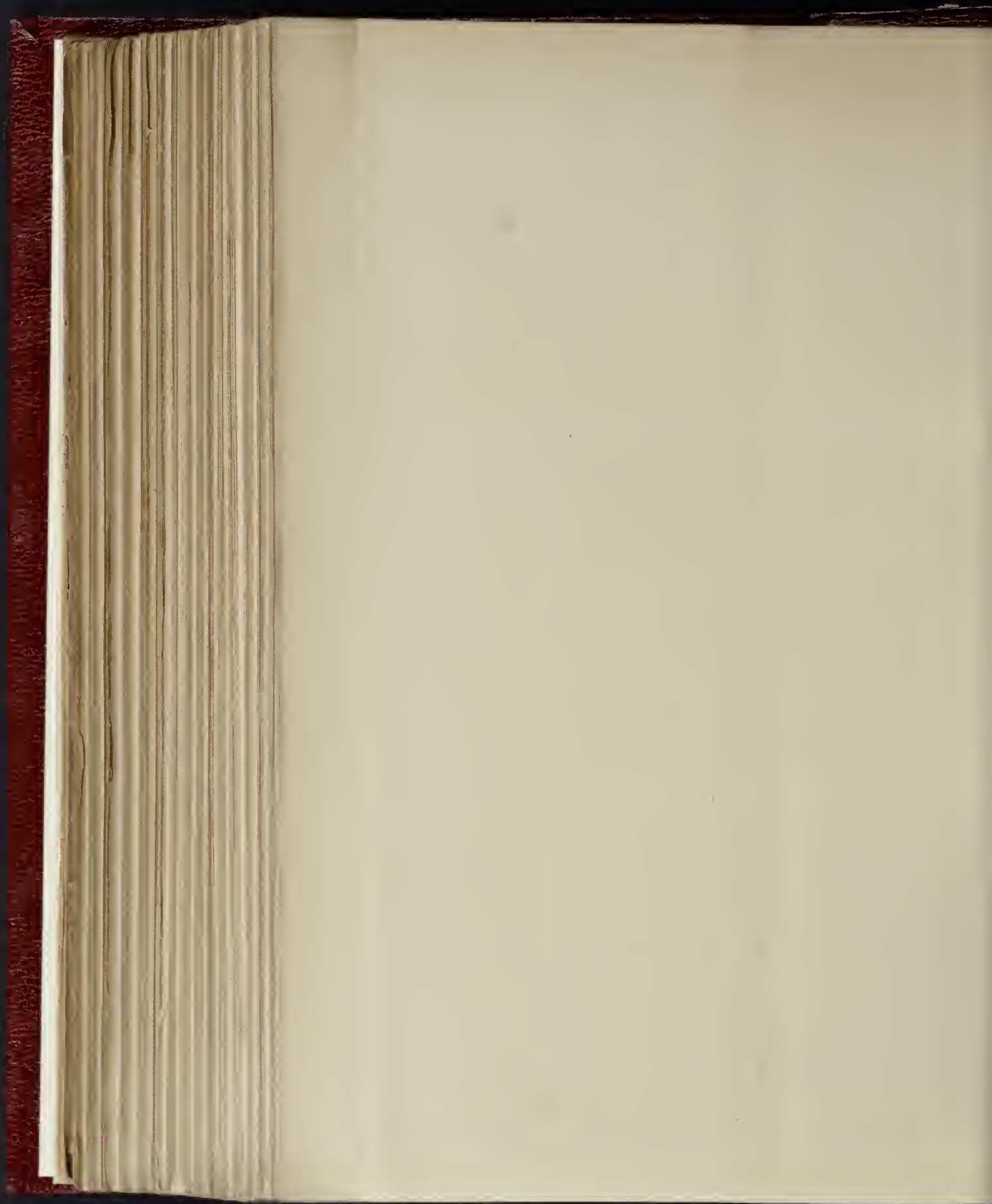
COMPETITION DESIGN FOR EXTENSION TO HULL TOWN HALL.—By Mr. JOHN MURRAY, F.R.I.B.A





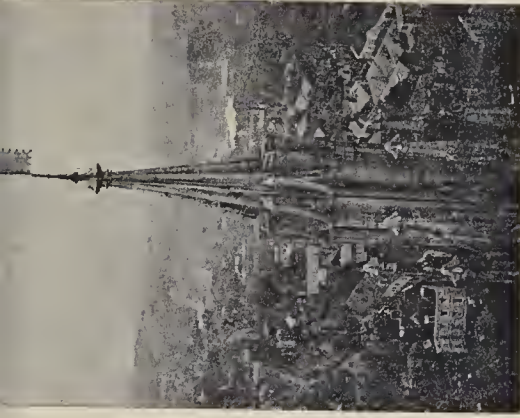
MR. PHOTOGRAPHIC & CO. LTD. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

NEW OFFICES FOR THE BRISTOL GAS COMPANY—Mr. W. V. Gough, Architect





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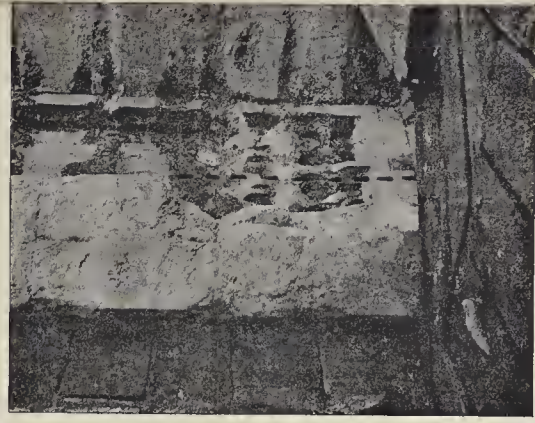
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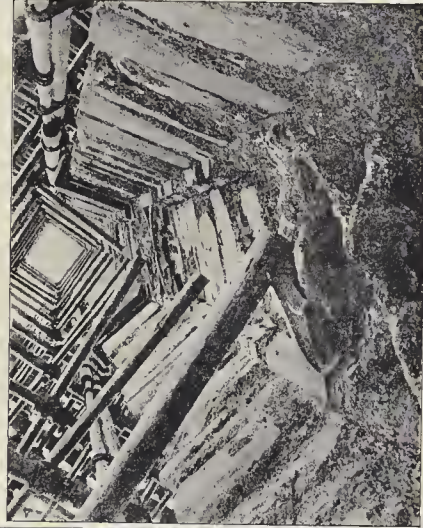
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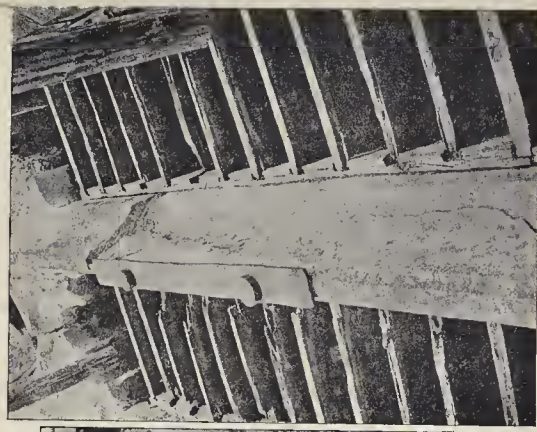
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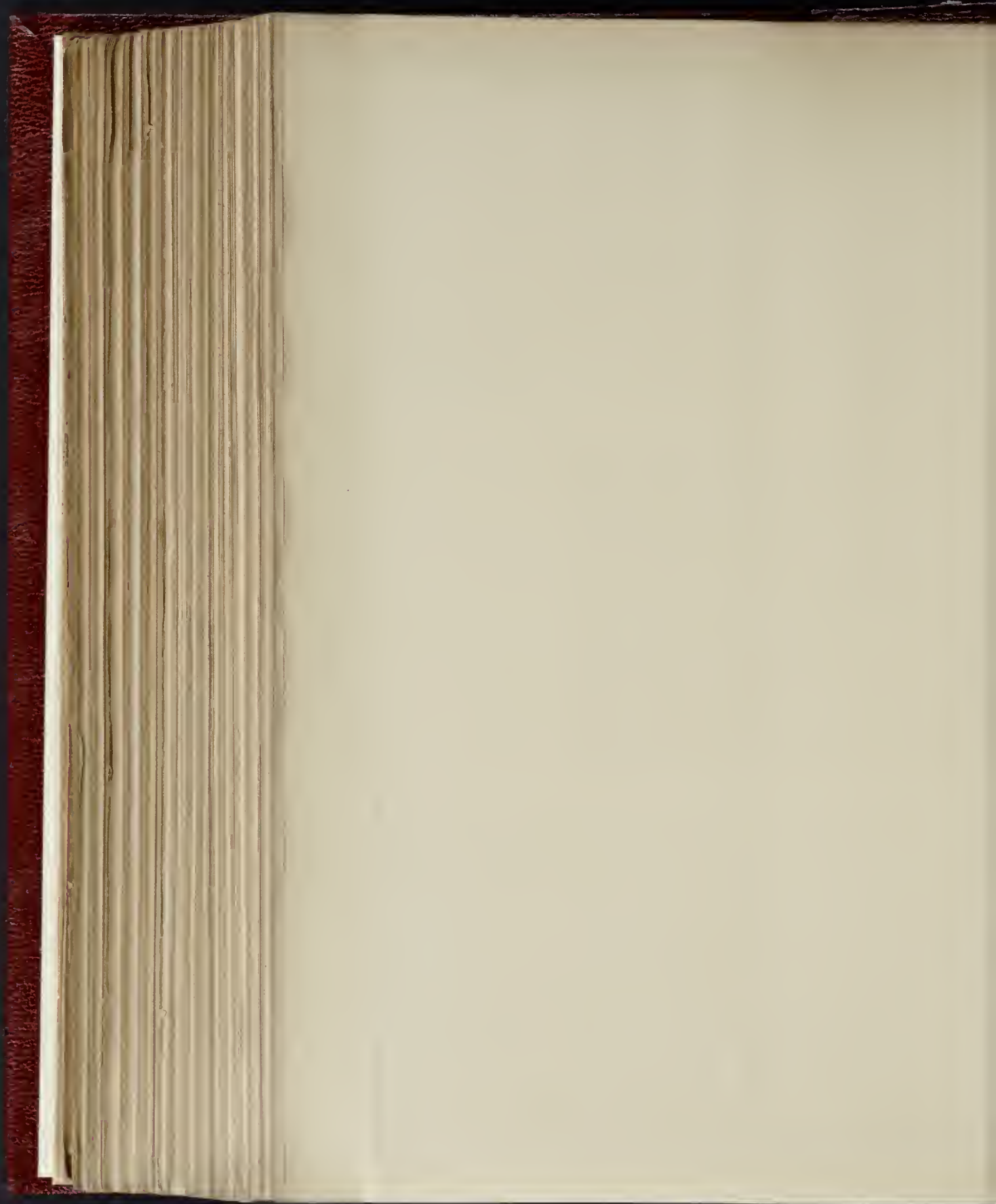


8.

PHOTOGRAPHS FROM
 CANTERBURY CATHEDRAL TOWER,
 SHOWING THE
 STATE OF DECAY OF VARIOUS PORTIONS.

References.

- 1—Lantern, S. W. Cracked million above the transom
- 2—S. W. Tower, showing the iron-topped gablets and the beads between on separate stones.
- 3—Lantern, South. (The transoms originally battlemented.)
- 4—Decayed ornament of the angle, S. E. (Morton's ribs).
- 5—S. E. Angle: the dotted ink lines show the proper size of the buttress.
- 6—Abreasted buttress, S. E. angle. The lath on the right shows the true line.
- 7—N. W. Angle, looking up. (This is in the best condition of all)
- 8—The Belfry, S. W. Cracked million repaired by iron strap (the whole has moved out two inches).



fittings dealt in by the Company, general
 and a kitchen department for the supply
 to the clerks; on the ground floor, the
 al public office, entrance hall, rooms for the
 al officials, and a large showroom for
 display of appliances for heating, cooking,
 lighting by gas, the sale and letting out
 of which now forms a large part of the
 cess of most gas companies; on the first
 the board room, directors' room, the
 cers' department, auditors' and collectors'
 s, and clerks' luncheon and smoking rooms;
 e upper floor are placed a room for teaching
 ry by gas, the caretakers' apartments, and
 shops for the repair and testing of meters
 gas stoves.

e lifts throughout the building will be
 ulic, worked by an accumulator auto-
 matically controlled by a gas engine, which
 also be used to illustrate the production of
 ic current by the use of gas.
 e main frontages will be faced with Bath
 stone, the ground floor balustrade and other
 on that level liable to damage being of
 te. The roof will be covered with thick
 slates.
 e clock turret will be constructed with
 inated faces, to rise above the roofs in the
 e of the main facade.
 e entrance hall and staircase, the general
 and board room, will be the only parts of
 erior treated ornamentally.
 e whole will have coffered plaster ceilings,
 floors of the two former will be laid with
 e, and marble will be used for the dadoes
 shafts of archways. The joinery to the
 l room, general office, and secretary's
 ill be of teak and the floors of oak. The
 e of the floors throughout the building
 e fireproof.
 e general contractor is Mr. C. A. Hayes,
 the architect Mr. W. V. Gough, both of
 ol.

PHOTOGRAPHS FROM CANTERBURY
 TOWER.

the kindness of Mr. Caröe, the architect
 charge of the repairs to the centre tower of
 Canterbury Cathedral, we are enabled to give
 illustrations of portions of the tower,
 photographs recently taken, which show
 present state of some of the work.
 s, 1, 3, and 8 show the condition of some
 e mullions in the tower windows, Nos. 5
 e extent to which some of the buttresses
 orn away. No. 2, which shows one of
 urret tops in which the gables (as men-
 ll last week) are capped at the apex by
 ars, is on too small a scale, unfortunately,
 ow all that it was intended to show; the
 work, as Mr. Caröe informs us, is put
 her much more like joinery than
 work. No. 7 is a view taken looking
 d through the scaffolding up one of the
 e of the tower. This illustrates one of the
 ns that is in best preservation.

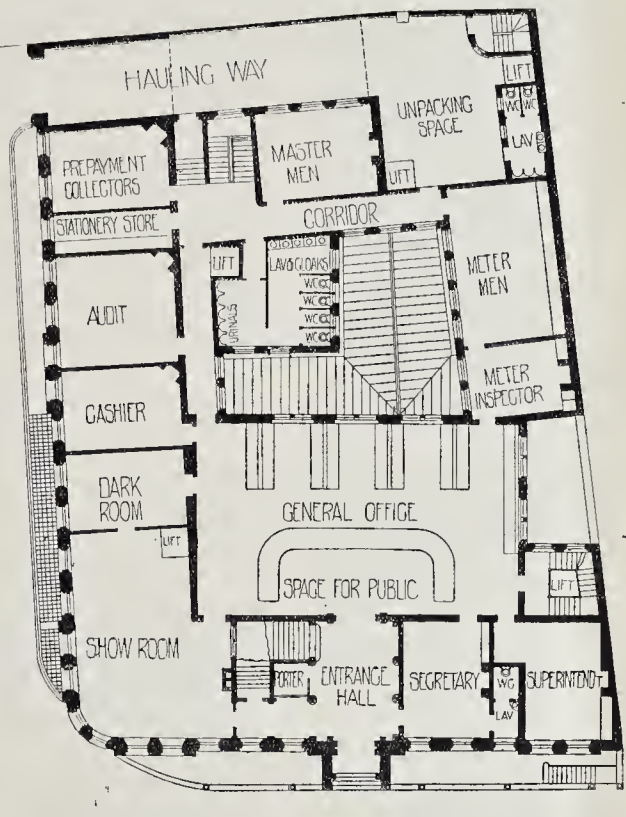
LUNATIC ASYLUMS.

Commissioners in Lunacy, in their fifty-
 report to the Lord Chancellor for the
 1903, devote many pages to an explana-
 of their views on the subject of large
 ns and of their objections to the use of
 rary buildings. Subjoined are the chief
 and arguments adduced:—
 e are unable to view without grave con-
 the modern tendency to undue increase in
 e of asylums for the insane poor, and we
 that the time has arrived when we should
 our protest against it. Its advocates
 it principally on the ground of con-
 ce and economy, and if this were proved,
 here were no weighty counterbalancing
 e should have no adequate grounds for the
 sion of adverse views. This is however, in
 opinion, far from being the case. We have
 failed to recognise the serious financial
 n which the continually increasing accumu-
 of the insane poor is imposing upon the
 unity, or to sympathise with every legiti-
 and practicable effort to lessen its onerous
 ter. As we have pointed out in previous
 es, we think that this might be done to an
 sible extent by the building of asylums
 pler forms of construction, in which the
 nd harmless class of patients who are now
 ed in increasing numbers from their homes
 on the wards of workhouses into asylums
 have been built and are fitted for acute
 might be accommodated and maintained
 somewhat cheaper rate. While such asylums
 have indicated could never be made abso-
 cheap, for the helpless and sick poor
 ate and would need all the appliances for

suitable nursing, we think that they could be
 built and furnished less expensively than at
 present and be conducted at a lower rate. The
 mixed asylums, as now built and organised,
 provide for all patients, in whatever mental
 and physical condition they may be, practically
 the same kind of accommodation and treatment,
 which for some is necessary but for others super-
 fluous. As long, however, as these asylums
 remain of moderate size they accomplish their
 objects, if in a somewhat expensive at least in an
 efficient manner; and the medical superintendent
 of each, who has presumably and generally been
 selected by the committee for his skill and
 experience in the treatment of mental disease, is
 able to apply those qualities to the treatment of
 all his patients and to be in close medical relation-
 ship to them. The moment that his asylum
 increases beyond a reasonable size this ceases to
 be possible. He loses touch with his patients, and
 has to delegate his medical functions to others
 who are, if not less able, usually less experienced
 than himself. When an asylum contains 2,000
 to 2,500 patients, as some of them now do, this
 delegation must necessarily apply to the great
 bulk of the patients, and the special qualifications
 of the medical superintendent become of com-
 paratively small value in the matter of medical
 treatment. The aggregation of large numbers
 of persons, moreover, within buildings upon a
 limited area gives rise to the origination or
 development of diseases of a serious and fatal type,
 such as that which has come to be known as
asylum dysentery. The evils of undue aggregation
 in consumption have already been widely recog-
 nised by the public, who have long since realised
 the extreme difficulty, if not impossibility, of
 maintaining in health even animals of the lower
 species which are kept in confinement under such
 conditions. As the population of asylums
 assumes proportions beyond certain limits their
 administration becomes increasingly difficult. It
 certainly does not conduce to greater efficiency,
 and it obviously cannot, therefore, be supported
 on the ground of economy. Of the sixty-two
 county asylums the weekly cost per head in
 maintenance in 1902 was, in thirty-six, which con-
 tained less than 1,000 patients each, 9s. 8½d.,
 whereas in twenty-six, each of them containing
 from 1,000 to 2,672 patients, the average weekly
 cost per head was 10s. 3½d., showing an excess of
 6½d. per head per week. As has been well pointed

out elsewhere, there would seem to be an unit of
 economical supervision and management which
 cannot be overpassed without waste and loss of
 efficiency. In the case of the Rowton Houses,
 this is said to have been found to be about 800
 beds. For these and other reasons of a similar
 nature we regard the present tendency unduly
 to enlarge county asylums as distinctly retro-
 gressive and opposed to the best interests both of
 the insane poor and of the public, upon whom
 falls the burden of their maintenance.

Temporary Buildings.—The Commissioners
 go on to state that immediately after the occur-
 rence of the deplorable and disastrous fire at
 Colney Hatch Asylum in the early part of 1903,
 resulting in the death of fifty-one patients and
 the entire destruction of the temporary
 buildings in which those patients were then
 lodged, they (the Commissioners) made a careful
 investigation with respect to the temporary
 buildings which had been erected at other
 asylums. They possessed themselves of full
 particulars upon all points which concerned
 their liability to danger from fire, and took such
 further steps as were within their power to limit
 that danger as far as possible and to insure the
 escape of the inmates in case of necessity. They
 made certain recommendations, and in some
 cases the course subsequently adopted in several
 of the institutions concerned had received their
 approval, but in others their strongly expressed
 opinions had been entirely disregarded. At
 Banstead Asylum the temporary buildings,
 first sanctioned in 1895, are still, the Com-
 missioners regret to report, in use, and in their
 opinion continue to menace the safety of not
 only the inmates of the temporary annexe but
 also the main building itself. It is the very
 strong opinion of the Commissioners that these
 buildings ought to be disused at the earliest
 possible moment, as they are constructed of
 highly-inflammable materials very similar to
 those with which the late temporary annexe at
 Colney Hatch Asylum was built. Pending the
 abolition of the temporary buildings the Home
 Secretary has approved certain alterations
 recommended by the Commissioners with a



New Offices for the Bristol Gas Company. Plan.

view to minimising the danger in case of an outbreak of fire. These alterations, which, in the judgment of the Commissioners, cannot safely be regarded as more than a temporary expedient, are as follows:—

- "1. The blocks of single rooms and the sides of connecting corridors have been removed.
- "2. The subways beneath the corridors have been partitioned by cross walls.
- "3. Concrete flooring has been laid at the entrance of the wards and also between the day-rooms and dormitories.
- "4. The work of staining and dry-rubbing the floors has been discontinued; and
- "5. Additional exits, opening outwards from all the rooms, have been provided."

With regard to the decision to erect at Banstead Asylum a new permanent block in lieu of the existing temporary buildings, the Commissioners express their strong objection to the course proposed on the ground that, as at Colney Hatch, there are special reasons militating against the proposals, inasmuch as both asylums are built upon estates too small to justify the enlargement of their buildings, the estate at Banstead being less than half the size which is regarded by the Commissioners as necessary for the purposes of an asylum in respect to the matters of exercise, recreation, useful occupation, and some forms of food supply.

The Commissioners also review at some length the proceedings in connexion with temporary buildings at the Denbigh, Durham, Essex, Glamorgan, Monmouth, Northumberland, Notts, Rainhill, and Brighton Asylums.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Clapham.—One-story shops in front of Nos. 20 to 48 (even numbers) inclusive, Battersea-rise, Battersea (Mr. W. N. Dunn for Mr. W. Williams).—Consent.

Kennington, South.—Buildings on a site on the south side of Kennington-road, Kennington, to abut also upon Palace gate (Messrs. Millard and Pryce for the Royal Exchange Assurance Company).—Consent.

Strand.—A projecting clock in front of Nos. 27 and 28, Haymarket (Mr. F. T. Verity for the Civil Service Co-operative Society, Ltd.).—Consent.

Hackney, North.—Retention at No. 45, Eastbank, Stamford-hill, Hackney, of an oak and tile porch at the front entrance, and of an oak and tile pent over the side entrance abutting upon Dunsmore-road (Mr. W. J. Ellis for Mr. T. Saxton).—Consent.

Hampstead.—Verandahs at Nos. 10, 12, 14, and 16, Crediton-road, Hampstead (Messrs. Boucher and Gibbs for Mr. E. Walker).—Consent.

Holborn.—A projecting clock at No. 125, High Holborn (Messrs. Jones and Ham for the Waltham Watch Company).—Consent.

Kensington, North.—An iron and glass shelter in front of No. 20, Pembroke-square, Kensington (Messrs. Towers, Ellis, and Co. for Mr. K. H. James).—Consent.

Kensington, South.—An additional story on the addition at the side of No. 42, Onslow-square, Kensington, abutting on Summer-terrace (Mr. E. H. Payne for Mrs. G. Hargreaves).—Consent.

St. George, Hanover-square.—A projecting sign in front of No. 157, New Bond-street, St. George, Hanover-square (Mr. I. C. Goodison for Messrs. Speaight, Ltd.).—Consent.

Chelsea.—Retention of a gas-meter house at the Ashburnham school, Lots-road, Chelsea (Mr. I. J. Bailey for the Education Committee of the Council).—Consent.

Clapham.—The completion of four houses, with porches and bay windows, on a site abutting upon the east side of St. James'-road and south side of Balham-park-road, Wandsworth-common (Messrs. White and Co.).—Consent.

Hammersmith.—Bay windows to twenty-two semi-detached houses in Flanchford-road, Hammersmith (Mr. A. Dawkins for Mr. W. G. Chapman).—Consent.

Hammersmith.—Re-erection of the "Wallington" public-house on the site of Nos. 102, 104, and 106, Uxbridge-road, Hammersmith (Mr. J. H. Richardson for Messrs. Watney, Combe, Reid, and Co.).—Consent.

Hampstead.—A bay window and porch to "Wayneffe," Eton-avenue, Hampstead (Mr. A. F. Faulkner for Mr. Willott).—Consent.

Hampstead.—A wooden porch in front of No. 30, Belsize-avenue, Hampstead (Messrs. M. H. Judge and Sons for Mr. F. Weintraud).—Consent.

Kennington.—One-story shops at No. 355, Wandsworth-road, Kennington (Mr. H. Bigrod for Mr. O. Camburn).—Consent.

Kennington, South.—Buildings on the south side of Hollis-street, Kennington (Messrs. Chesterton and Sons for Messrs. C. A. Daw and Son).—Consent.

Lewisham.—Twelve houses with bay windows on the northern side of Rutland-road, Perry-hill, Catford (Mr. W. C. Poole for Mr. J. Johnson).—Consent.

Lewisham.—That the application of Messrs. W. D. Church and Son on behalf of the Rev. F. A. Trick for an extension of the periods within which the erection of a porch in front of a proposed church on the south-eastern side of Torridon-road, Lewisham, was required to be commenced and completed be granted.—Consent.

Paddington, South.—A porch and balustrade in front of No. 36, Gloucester-gardens, Bishop-road, Paddington (Messrs. M. H. Judge and Sons for Mr. A. Dowie).—Consent.

Pekham.—Buildings on the site of Nos. 295 and 297, Commercial-road, Peckham (Mr. A. Budds for Mr. A. L. Horlock).—Consent.

Wandsworth.—The erection of sixteen houses with bay windows on the southern side of Mayford-road, Wandsworth-common, eastward of Ravenslea-road (Mr. W. C. Poole for Mr. W. E. Kerven).—Consent.

Lewisham.—One-story shops in front of Nos. 120 and 122, Sydenham-road, Lewisham (Mr. H. E. Davey for Mr. W. Cooper).—Refused.

Paddington, South.—A building upon the site of Nos. 127 and 129, Edgware-road, Paddington, to abut also upon Burwood-place (Messrs. Bouchier, Burmester, and Galsworthy for the London and Provincial Bank, Ltd.).—Refused.

Strand.—That the Council do not accede to the request of Messrs. Wilkinson, Howlett, and Wilkinson on behalf of Mr. P. Curzon for permission to retain a projecting wood and canvas sign in front of the Strand Theatre, Strand.—Refused.

Hackney, South.—The retention of a wood, glass, and iron porch at the Workhouse, Sidney-road, Hornerton (Mr. F. R. Coles for the Guardians of the Hackney Union).—Refused.

Hammersmith.—The retention of a sign-board in front of Nos. 36 and 38, Uxbridge-road, Hammersmith (Mr. A. Sykes for Messrs. Lilley and Skinner).—Refused.

Kensington, South.—A conservatory building on the south side of Cromwell-road, Kensington, westward of Collingham-road (Mr. J. D. Hunter for Mr. J. Russell).—Refused.

Kensington, South.—Stone entrance steps and a glazed canopy at No. 31, Holland-park, Kensington, to abut upon Holland-park-avenue (Messrs. Rawlings Brothers, Ltd., for Mr. R. Bradford).—Refused.

Norwood.—Houses with shops on the west side of Brixton-hill between Acre-lane and Hayter-road, Norwood (Messrs. Gush, Phillips, Walters and Williams for Mr. R. A. Johnston and Miss C. S. T. Johnston).—Refused.

Wandsworth.—A dwelling-house, No. 10, Mount Ephraim-road, to abut upon Blakemore-road, Wandsworth (Mr. W. N. Dunn).—Refused.

Westminster.—A one-story shop in front of No. 276, Vauxhall-bridge-road (Mr. H. Branch for Mr. R. W. Essex).—Refused.

Width of Way.

Hackney, Central.—The retention of a one-story building on the west side of Roseberry-place, Dalston (Mr. E. C. Trench for the North London Railway Company).—Consent.

Finsbury, East.—A building on a site abutting on Great Arthur-street and Little Arthur-street, Finsbury (Mr. J. Groom for Mr. C. Clifford).—Consent.

Battersea.—A building on the south side of Cabul-road, Battersea (Mr. E. Cannell for Mr. F. Priddis).—Consent.

Bethnal Green, South-west.—The retention of a building, consisting of a range of water-closets, on the western side of Paradise-row, Bethnal Green, with external walls and a boundary fence (Sir Joseph Causton and Sons, Ltd.).—Consent.

Greenwich.—A building on the west side of a street leading out of the south side of Greenwich-road, Greenwich, westward of the Royal Kent Dispensary (Messrs. Young and Hall for the Committee of the Miller Hospital and Royal Kent Dispensary).—Consent.

Southwark, West.—Buildings on the site of No. 54, Lant-street, Borough (Messrs. A. C. Potter and Co.).—Consent.

Hackney, Central.—The erection of houses on the west side of Woodland-street, Dalston, northward of Holy Trinity Church (Mr. D. P. Hayworth).—Consent.

Rotherhithe.—An addition at the rear of No. 42, Lower road, Rotherhithe (Mr. E. F. Thompson for Messrs. A. J. White and F. S. Neame).—Consent.

Wandsworth.—A church on a site abutting upon the east side of South-street and west side of Iron Mill-place, Wandsworth (Mr. W. Mountford).—Consent.

Brixton.—Two cottages in an alley in the south-cottages, Warham-street, Kennington (Mr. G. Trotman for Mr. J. Skinner).—Consent.

Width of Way and Line of Front.
Finsbury, East.—Buildings upon a site abutting upon the south side of City-road, east side of Nelson-street, and east side of City-road, Finsbury (Messrs. Yotis, Sturdy, Usher for Messrs. T. Wallis and Co., Ltd.).—Consent.

Kensington, South.—Two two-story buildings to a building on the east side of City-street, abutting upon the south side of Mall, Kensington (Mr. W. M. Weir for Mr. H. and T. Harris).—Consent.

Battersea.—The retention of a bay window in front of the Battersea Liberal Club, Colney-lane, Battersea (Mr. F. Banister for the Battersea Liberal Club).—Consent.

Lines of Frontage and Construction.

Islington, East.—An iron and glass canopy way at the first floor level in front of Nos. 302 and 304, Essex-road, Islington (Mr. J. Lovegrove for Mr. J. King).—Consent.

Rotherhithe.—The retention of a grain access Rotherhithe-street and of an iron bridge across Princes-stairs, Rotherhithe (Mr. G. Gillman and Spencer (1902), Ltd.).—Consent.

City of London.—The retention of an iron and glass covered way over London-yard, City, connecting Nos. 79 and 81, Paul's-churchyard (Messrs. J. Spence and Co., Ltd.).—Consent.

Southwark, West.—A deviation from plan approved for the erection of an iron and concrete gangway to connect the fourth floor of "Clink Wharf," Clink Wharf, Southwark, with the roof level of "The Works" on the south side of the street, as relates to the substitution of three 7 in. by 33 in. H steel joists for two 9 in. by 33 in. H steel main supporting beams, and chequered iron plate for the concrete floor of such gangway (Mr. R. H. Kerr for Mr. Noel and Sons, Ltd.).—Consent.

Rotherhithe.—The retention of two cases in front of No. 244, Southwark-road, Rotherhithe (Mr. S. J. H. Stua for Mr. Neave).—Consent.

Stepney.—The retention of a wood and building at the rear, and of a show-case the forecourt, of No. 274, Commercial Street.—Refused.

Formation of Streets.

Lewisham.—That an order be issued by C. J. Bentley sanctioning the formation of a new street for carriage traffic to lead out of the south-eastern side of stone-road, Lewisham.—Consent.

Whitechapel.—That the application of Messrs. R. Plumbo and Harvey for a revision of the period within which the widening and adaptation as a street for carriage traffic of the northern portion of Rose-street, Mile-end Old Town, was required, clearly defined by posts and markers, or otherwise as the Council might please, and thrown open to the public as a byway be granted.—Consent.

Greenwich.—That an order be issued by C. Reilly, refusing to sanction the formation or laying out of new streets for carriage traffic, out of the west side of Victoria-charlton (for the President and Governors of Queen Elizabeth's College, Greenwich).—Consent.

Hampstead.—That an order be issued by Messrs. Farebrother, Ellis, and Co. refusing to sanction the formation or laying out of new street for carriage traffic, to lead from Redington-road to Bracknell-gardens, Istead (for Sir Spencer P. M. Marryon-V. Bart.).—Refused.

St. George-in-the-East.—That an order be issued by Mr. A. Davis refusing to sanction street for foot traffic formed at the rear of houses in Morgan-street, Stepney.—Refused.

Cubical Extent.

Hoxton.—A modification of the consent upon which consent was given under sections 207 and 76 of the Act, to the erection of the Guttapercha Company's premises, V-road, Hoxton, of a building with two divisions, each exceeding in extent 250,000 cubic ft., so far as relates to the omission of fire-resisting plaster, 2 in. to five columns, on which columns cranes, in the testing-tank room in the basement (Mr. P. E. Pilditch for the Guttapercha Company).—Consent.

Clapham.—The erection at the Brick Nine-alms-lane, Nine-elms, of a building exceeding in extent 250,000 cubic ft., and used as a bottling store (Messrs. Lee and Co. for Messrs. Thorne).—Refused.

Space at Rear.

Windsor.—A modification of the provisions of section 41 of the Act with regard to open spaces about buildings, so far as respects to the proposed erection of a building on the south-west side of Totterdown-street, being, with an irregular open space about a building (Mr. W. Bartholomew).—Consent.

Wolwich.—A modification of the provisions of section 41 of the Act with regard to open spaces about buildings, so far as respects to the proposed erection of an addition to Northam-road, Plumstead, with an irregular open space at the rear (Mr. J. H. Sutcliffe Mrs. S. H. Smith).—Consent.

of Frontage, Width of Way, and Widening of Street.

Pancras, North.—A building upon the site of Nos. 9, 11, 13, 15 and 17, Highgate-st. Pancras, to abut also upon Green-place, and in connexion with the erection of a building the widening of a portion of Green-wood-place (Mr. G. H. Greatbaird for W. A. Curnock).—Refused.

Buildings for the Supply of Electricity.

City of London.—A deviation from the plans approved for the construction of a five-story building on the site of Nos. 32, 33, and 34, Church-street, City, so far as relates to certain alterations of the positions of the main partitions and the addition of an staircase between the ground and first floor; (2) the placing of all the lavatories on the fourth floor instead of distributing them on the various floors; (3) the addition of lavatories in the rooms thus cleared of lavatories; (4) the placing of a lantern light over the fourth floor lavatories; (5) the omission of skylight, which was formerly over the lavatories on the ground floor (Mr. W. E. Brown for the Charing-cross and Strand Electric Supply Corporation, Ltd.).—Consent.

Means of Escape at Top of High Buildings.
Waterloo.—Means of escape in case of fire, to be provided in pursuance of section 53 of the Act, on the sixth (top) story of the Waterloo Hotel, Jermyn-street, St. James' upper surface of the floor of which story rose 60 ft. from the street level for the persons dwelling or employed therein (Mr. D. Martin for the Waterloo Syndicate).—Consent.

Means of escape in case of fire.—Means of escape in case of fire, to be provided in pursuance of section 53 of the Act, on the seventh (top), sixth, and fifth stories of the Savoy Hotel offices (block), Strand, for the persons dwelling or employed therein (Messrs. Colclutt and Co.).—Refused.

Recommendations marked + are contrary to the views of the local authority.

ENGINEERING SOCIETIES.

ROYAL UNITED SERVICE INSTITUTION, Whitechapel.—At a meeting held on the 3rd inst., Mr. D. B. Butler, President in the chair, a paper was read on "Deep erosion and foreshore protection," by Mr. E. Allanson-Winn, M.Inst.C.E.I., and of the following is an abstract:—The speaker first pointed out that, in consideration of the erosion in the majority of cases given to the visible shore and the agencies of destruction, whilst the physical conditions and changes going on in the depths of the sea were overlooked. The theory advanced by him was that, in all places where the encroachment of the sea was steady and continuous and the soil was of a soft and easily eroded nature, considerable depth below low-water level, protective devices erected on the visible shore in high and low water marks would not only arrest the encroachment of the sea, but they might afford temporary protection by collecting and retaining material for short periods. It would not be denied that the sea had been changing in many places, and the author said he would not lay claim to any fresh discovery in this direction, but he claimed to be the first to bring to the public attention a new point of view, and to suggest that very often the encroachment of the sea was due more to the presence of material below low-water level than to the erosion of the visible shore. It was this new aspect of the problem which appeared to be deserving of the attention, and the author observed that investigations should be made with the view of ascertaining to what extent the unseen forces might be causing the encroachments in any particular place, how far the theory applied to any particular case, and what measures should be taken to mitigate the evil. Instances were cited

of places on the east coasts of both England and Ireland where, in the opinion of the author, that class of erosion was especially marked. An account of the inland march of the sea at Glenbeigh during the past fifty years was given to show how persistently deep water had advanced, whilst additional evidence was produced to prove a similar state of affairs all along the Holderness coast of Yorkshire, where might now be pointed out situations, in the neighbourhood of the present five-fathom line, where formerly towns and villages stood on the dry cliffs. The author held that additional absolute proof of deep-sea erosion was to be found in the carrying up of sand, shells, and large stones attached to the *laminaria digitata* and various deep-sea weeds. Those materials could only come from depths below low-water level, and it was certain that on their removal the vacancy caused must have been, in the first instance, filled up by sea-water, and that therefore the depth of water at that particular spot must have been greater than it was prior to the removal. In other words, the erosion had caused an advance of deeper water shorewards. Allusion was made to the possibility of the sinking or subsidence of certain coast lines and the rising of others. The author stated that he had heard that the south of Ireland was subsiding and the north rising, and that in Norway the inhabitants showed certain marks on the rocks which were formerly washed by the waves, but which were now far beyond the reach of even the highest tides. He stated, however, that he had had no opportunity of investigating those alleged alterations of levels, and, of course, any comparison of shore levels with adjacent bench marks would only be misleading, as the bench marks themselves would probably have sunk as well as the neighbouring country. The author suggested that a clearer view might be arrived at if we regarded as "sea bed" all surfaces actually beneath the sea at highest spring tides. If that view were accepted, we could more easily eliminate from our minds the popular fallacy that all our troubles began and ended in the changes observed on the little strip of visible shore between high and low water marks. He observed that it had been so long customary to speak of "beach," "shore," or "foreshore," as quite distinct from "sea bed" or "sea bottom," that we might get into the habit of regarding them as not being continuations of the same surface. We had, for example, been in the habit of regarding the shore as a natural bank with a very flat gradient, the toe of which extended to low-water mark. It would be more correct to look upon the junction of the glacial drift or other erodible material with the chalk, rock, or other hard material as the toe of the bank under consideration, quite irrespective of whether the junction was above or below low-water level. Alluding to protective devices, the author described a form of slanting and curved groyne which he thought might be applied to many shores with advantage. He claimed that that form of groyne combined many of the advantages of the high slanting groynes and the low groynes. In conclusion, the author mentioned that he believed he had discovered an entirely new method of groyning, and that, as soon as he had given his discovery a practical test, he would bring the subject before the Society.

COMPETITIONS.

STAMFORD FREE LIBRARY.—Messrs. Buckland and Farmer, who were given as the winners of the second premium in this competition, write to say that the name of Mr. G. H. Vernon Cale should have been given, as their partner in the preparation of the design. The mistake is not ours; we gave the list as officially communicated.

THE PROPOSED CONCERT HALL AND PAVILION, AYR.—The Town Council at a special meeting on the 29th ult. considered a report by Mr. James A. Morris, F.R.I.B.A., Ayr, who had been appointed assessor on the twenty-nine competitive plans for the proposed concert hall and pavilion on the Low Green. Mr. Morris placed first the plans sent in by Mr. J. K. Hunter, Ayr, and bracketed equal the designs submitted by Mr. Henry Higgins, jun., 248, West George-street, Glasgow, and by Mr. Eric A. Sutherland, 90, Renfield-street, Glasgow, and Messrs. Magnall and Littlewoods, 42, Spring Gardens, Manchester, jointly. In accordance with the assessor's decision Mr. Hunter was awarded the 50*l.* premium, and it was agreed to give 25*l.* to each of the next two.

SCHOOL, ACCRINGTON.—The Accrington Town Council in committee on the 3rd inst. rejected a recommendation from the Education Committee that plans for a new day school at Woodnook be prepared by the Borough Surveyor, and that the latter should be paid an honorarium of 200*l.* This work is to be thrown open to competition, and 400*l.* awarded to the successful architect. —*Yorkshire Post.*

Books.

The Cathedrals of Northern France. By FRANCIS MILTOUN. London: T. Werner Laurie. 1904.

THIS is an octavo volume of nearly four hundred pages—perhaps a small space into which to compress an adequate description of so large a subject. The author appears to have devoted much time and labour to this work, and to have personally visited the buildings. He has no doubt endeavoured, as suggested in the introduction, to produce something that has little resemblance to a guide-book, and the letterpress is chiefly a record of personal impressions and criticisms interwoven with a certain amount of technical detail and historical facts. Whether so large a subject can be dealt with satisfactorily in this way is doubtful, and, although there is a certain charm in portions of the work, the whole fails to impress, and at the same time suggests the desirability of conciseness in arrangement. No less than ten appendices are at the end of the book, much of the information in which might well have been incorporated in the descriptions. A glossary of architectural terms—which seems an almost inevitable adjunct to this kind of book—is included.

The illustrations and plans are of the poorest possible description. It is inconceivable that, in these days of improved book illustrations, such drawings of Notre Dame, Beauvais, Chartres, and Amiens—to mention but a few—should find a place in the book at all. It would have been far better had they been omitted. And when at the beginning of the book we find the book dedicated to "the genius of the race which made possible the existence of these architectural glories of France," it seems quite unaccountable that more care was not taken to make the illustrations worthy of the subject. In Appendix No. 6, which has a series of plans to a very small scale, plans of portions of the city are in three instances introduced instead of the plan of the church. There is no plan of Chartres and several of the lesser buildings given in the list.

With adequate illustrations and plans the book would be vastly improved; and it would be well if the somewhat ghostly representations of four cathedrals on the cover were omitted.

Hints on the Planning of Poor-Law Buildings and Mortuaries. By ALBERT C. FREEMAN, architect. London: St. Bride's Press.

THE paper, type, and binding of this book are so admirable that the reviewer brings to the reading of it a mind prepossessed in its favour. His pleasant anticipations, however, are soon shocked by the slipshod English in which it is written. The second paragraph of the first chapter (page 11) is an early example, but many others occur throughout the book. On page 22 there are two, which we quote as specimens:—"The building, if planned with two wings or projecting blocks at the rear of the building, the male and female accommodation can be satisfactorily arranged in the respective wings or blocks"; "Apartments are necessary in a large infirmary for an assistant medical officer in addition to the medical officer, and he situated as to afford complete privacy." On page 39 the author is unconsciously humorous—"Wards provided for epileptic patients should be placed on the ground floor level, this class of patient being subject to fits." The italics are ours.

We hasten to add that the author's general treatment of his subject is better than his grammar. He discusses in turn the various rooms and buildings which go to the making of a complete workhouse, including the buildings for casuals and vagrants, the administration buildings, receiving-wards, buildings for the able-bodied, aged and infirm, isolation and maternity wards, mortuaries, laundries, etc. The subject of "Cottage Homes for Children" is also fully treated. Many excellent hints are given,

and the requirements of the Local Government Board are clearly stated. The illustrations are a valuable feature, and include many examples of buildings or parts of buildings designed by well-known architects. With one exception, the north points are not marked on the plans; this is a serious omission, and is not rectified in the text. Precise hints on the best aspect for the various rooms, and particularly for the wards, ought certainly to have been given.

Model Answers to Questions Set by the Sanitary Institute. London: The Sanitary Publishing Co. 1904.

It is not an easy matter to answer examination questions tersely and accurately, and we fear that some of the answers given by the anonymous author of this volume would fail to obtain the full number of marks. In his "Advice to Candidates" he says wisely, "before answering a question, it should be read, and read again, until it is thoroughly understood," but he does not always practise what he advises. The answer to Question 23 ignores the first part of the question and does not adequately consider the subordinate clause in the second part. Question 108 asks, "What are the contents in cubic feet" of a certain room? The author cuts off 3 ft. from the side of the room, "on account of the lowness of the sloping part of the ceiling"—it is 7 ft. high at the lowest part—and gives the cubical contents of the remaining portion. This is not a correct answer to the definite question. "Why is a valve-closet inserted for use as a slop-sink?" is not answered by giving objections to such use. In the next answer the author omits to mention pail-closets, although the question specifies them, and also ignores the "economic" merits and demerits of the different types of closet. He appears, also, to forget that the Sanitary Institute hold an examination in "Practical Sanitary Science," which is attended by many who are not sanitary inspectors; and he makes the mistake of introducing a great deal of irrelevant matter as to the powers of sanitary inspectors into his answers to questions of a purely practical nature. Question 141 asks plainly, "What points should be specially considered in testing drains and soil-pipes?" The answer contains about 160 words entirely irrelevant to the question, and devotes only sixty words to an answer in which soil-pipes are not mentioned. A still worse example is the answer to Question 145—"How would you inspect the concrete and brickwork in a house in course of erection?" The answer contains 400 words, of which 350 are superfluous and the remaining fifty are a sanitary inspector's evasion of the direct question. These are not the only answers which appear to us to be defective or erroneous, but it is unnecessary to give other examples. The book is evidently written for sanitary inspectors, and many of the answers are quite accurate and to the point. May we suggest another scrap of "Advice to Candidates"? "Never say anything about matters not directly included in the question; if you do, you exasperate the examiner, and also increase the possibilities of error."

Heating and Ventilation of Houses. By C. F. TOWNSEND, F.C.S. London: Dawbarn and Ward. 1904.

This is one of a series of "Rural Handbooks." It is a little book of thirty-six pages, and, as about one-fourth of the space is occupied by illustrations, it is obvious that the subject is not treated in an exhaustive manner. The author is in favour of admitting air to a house by means of a downcast shaft, the top of which is 20 ft. or 30 ft. above the ground, but this is not such an easy matter as the author appears to think; the shaft can be built, but whether the air will always flow down it is another matter. In the part on heating, we look in vain for some of the most modern types of fire-grate. The author writes lucidly and to the point, and the book is clearly printed on good paper.

Old West Surrey. By GERTRUDE JEKILL. London: Longmans, Green, and Co. 1904.

This book is a record of the old buildings, furniture, industries, and habits of the people of West Surrey, and, though pretending to no literary style, is yet a most pleasant book to read. There are more than three hundred

illustrations from photographs, taken by the author. The cottages are familiar to many who do not know Surrey, for they are the same that Mrs. Allingham so often gives us in her pictures. There are two photographs of new cottages on an old pattern, which are very charming. There are also some delightful specimens of furniture, especially the oak linen-hutch on page 51 and the chairs on page 60.

One chapter deals with the people themselves and their old sayings and doings, another with their clothes, and one, perhaps the most interesting of all, treats of "churchyards then and now." In connexion with this subject the author has some excellent remarks on the difference between ancient and modern churchyard monuments:—

"In the older days, monuments in country churchyards erected to the memory of people of means and of some importance of standing were specially designed by a competent architect. Often they took the form of fine altar-tombs—monuments of much dignity, excellent in proportion, with sufficient and well-placed ornament and well-drawn mouldings. . . . The monuments, if any, to members of the labouring class or people who could not well afford stone were the dignified but unpretentious grave-boards. Each district had a traditional pattern of funeral at the heads of the posts and of ornamental outline of the lower edge of the board. The latest I know in this district bears the date 1861. It is much to be regretted that this simple form of monument should have passed out of use. The cast-iron crosses from the ironmonger's pattern-book are but a sorry substitute for the honest piece of carpenter's work made in the dead man's own village, perhaps by a younger man of his own blood; in any case by one who was known to him."

"It is this invasion of the pattern-book and love of meretricious display that is so regretably spoiling our churchyards. It was a sad day for the most hallowed spots of English ground when traders introduced from the Continent and pushed into public notice those artificial wreaths under half round glasses that debase and disfigure so many of these sacred places. . . . I have seen as a monument over a grave (in France) an iron erection exactly like a hat-stand, with pegs for the holding of bead-work wreaths. Is this honouring the dead? Let us jealously guard and treasure the quiet beauty and dignity of our country churchyards and, above all, keep them from the desecration of anything ill-designed, mean, or tawdry."

Minchew, Porlock, and Dunster. By C. E. LARTER. Second Edition. London: The Homeland Association. 1904.

NOTHING but praise can be said of this excellent guide—one of the Homeland Series—with its interesting and brightly-written letterpress and capital illustrations—chiefly from photographs, but including some from drawings by Mr. Gordon Home. The district of Exmoor and that which lies immediately to the east, on the Somerset side, is full of most picturesque villages. Minchew itself has in recent years become a flourishing watering-place, without losing, however, the picturesque quality of the old port and village; and there are numberless points of interest and attraction in the villages between it and the Quantocks, including Dunster, and the Cistercian Abbey at Cleve. West of Minchew is Porlock. All are well illustrated and described, and four chapters are added on the stag-hunting, fishing, and geology of the neighbourhood.

BOOKS RECEIVED.

STUDIES IN ASTRONOMY. By J. Ellard Gore, F.R.A.S. (Chatto and Windus. 6s.)

THIRTY-THIRD ANNUAL REPORT OF THE LOCAL GOVERNMENT BOARD. (Eyre and Spottiswoode. 4s. 11d.)

A HANDBOOK TO AGRA AND THE TAJ. By E. E. Havell. (Longmans, Green, and Co. 5s.)

SUNDIALS: PAST AND PRESENT. By T. Harrison Myres, F.R.I.B.A.

PRACTICAL SURVEYING. By G. W. USH, A.M.Inst.C.E. Eighth edition, revised and enlarged by A. Beazeley, M.Inst.C.E. (Crosby Lockwood and S. n. 7s. 6d.)

A DOULTON PANEL FOR RUSSIA.—Messrs. Doulton have on view a large ikon, 15 ft. 10 in. by 11 ft. 9 in., executed to the order of Mr. Robert Meltzer, Court Architect, for the Orthopedic Hospital now being built in St. Petersburg. It is to be built into the outside front wall, and is in a hard-fired material to resist the extreme cold.

TRADE CATALOGUES.

MR. J. S. HENRY sends us five little but wooden electric fittings. The illustration either hanging or standard lamps. Wood material that has not been much used in connexion, and it has distinct possibilities of artistic treatment. The designs shown in the catalogue are almost entirely new ones with few exceptions, are of considerable value. One advantage of the use of wood in metal is the saving of expense. We remember to have seen before fittings at a reasonable price.

Messrs. Orenstein and Koppel send us catalogue No. 620, chiefly occupied with illustrations of requisites for portable railway contractors' trucks, and wagons of various incline and overhead railways, tank locomotives and of the concrete mixer made by them. Very little descriptive matter is given in the mere names of the different objects, but the pamphlet will be found useful to contractors and others using plant of the kind illustrated.

We have received from the General Electric Co., of Queen Victoria-street, a new edition of their catalogue of main switches and circuit breakers. The class of switch described seems admirably adapted for its purpose, the break being long and being made very rapidly. "Adelphi" switches, which are contained in iron case, are very substantial, and should be the requirements of those who use motors running at high pressures. We are glad to see the cut-outs are made with a sufficiently large break, and that a large clearance is left between the conducting metal parts and the The "hobbin" and "arch" types of which are made of porcelain are well known and are very suitable for main switchboards.

The Student's Column

NOTES ON PORTLAND CEMENT.

CHAPTER X.—THE ACTION OF SEA-WATER.

THE failure of cement concrete at Aberdeen Harbour in 1887 was a considerable amount of attention amongst engineers who were engaged in the construction of sea-water works. Reports of Mr. Smith, the Harbour Engineer, in conjunction with Professor Brazier, Aberdeen University, went to show that the action of sea-water had a decomposing effect on cement. In this opinion they were supported by the late Mr. Messent, an engineer of considerable experience in sea work. After a considerable amount of chemical and physical research these gentlemen, the conclusion drawn was that the sea-water had a dissolving action on the cement, as shown by the amount of magnesia in the concrete taken from the dock. Professor Brazier attributed the presence of this magnesia to the sea-water dissolving lime out of the cement and the solid lime precipitating the magnesia from the water. To corroborate his views, he dissolved cement in a powdered state with sea-water with constant stirring to prevent it from setting, and found that a certain amount of lime dissolved out and a quantity of magnesia deposited.

Professor Brazier, however, lost sight of the fact that, by preventing the cement from setting, the free or loosely-combined lime in all Portland cements was not allowed to combine with the compounds which would resist the action of the sea-water. It does not follow because cement in the powdered state is acted on by the salts in sea-water, that the same cement will be decomposed after setting, as its chemical constitution is quite altered in the process of setting.

It was afterwards conclusively shown that the Aberdeen failure was due to poor quality cement, excess of sand, and the porous nature of the concrete.

Candlot investigated the action of sea-water on mortars, his experiments extending over a period of forty years. The mortars were of Portland cement, natural cements, puzzolanas mixed with sand, trass, etc. The Portland cement blocks remained in good condition, while all the others completely lost their cohesion in different periods. Neat cement was found to more rapidly acted on than cement and mortar, and the mortars offering the greatest resistance were those consisting of 1 part cement to 1 or 2 parts sand, or a proportion

ent sufficient to fill the voids between
ins of sand, this making the least porous

Chatelier has shown that compounds of
um are the constituents of cement
subject to attack by sea-water. The
osition arises from the action of calcium
e on the aluminates of lime, and the
sulphate is itself produced by a reaction
in the lime in the cement and the sulphate
nesia in the sea-water. The disintegration
the greater the larger the percentage
ina in the cement; thus, with cement
ing 1 to 2 per cent. it is very slight,
with 7 or 8 per cent. the swelling in sea-
water is marked.

In the view of producing a mortar more
in sea-water, Le Chatelier investigated
ct of replacing alumina by other oxides
acting with sulphate of lime. The
ments tried were oxides of iron, cobalt,
manganese. The cements thus
d were found to be more stable in the
e of sulphate of lime than those con-
much alumina, the best results being
d with Fe₂O₃.

Chatelier also observed that cements
small percentages of lime are less
than those with more lime and an
percentage of alumina, and that addition
olana does much to mitigate the chemical
of sea-water.

Chatelier has supplied some valuable
on the action of sea-water on
d cement. He maintains that Portland
from a chemical point of view, is too
lime. Cement containing 61.04 per
lime would leave after setting 13.79 per
O unhydrated. In a cement of average
tion with 1 part silicate to 2 parts
5 per cent. CaO or 33 per cent. Ca(HO)₂
be segregated. A body containing a
ee of such strong chemical affinity as
se cannot be regarded as stable. The
ne will continue to react till it forms
ed compounds.

In the mortar hardens in air or water
ing CO₂, the lime is converted into
ite but in sea-water it is chiefly the
es which act on the lime.

The formation of the sulphate of lime with
bivalents of water causes a considerable
of volume, and may destroy the
a of the mass.

The formation of sulphate of lime, the
ion of lime-alumino sulphate goes
hand, and causes an enormous increase
ne and a total destruction of the cohesion,
e double compound crystallises with
t, thirdly, probably sixty, equivalents
r, and, in doing so, converts the strongest
into a mud, the only parts of which
g any cohesion being those protected
formation of carbonate. Even if cement
be exposed to air till a protective skin of
ite is formed, such a skin cannot attain
siderable thickness, and the chemical
to which the destruction of the cohesion
attributed will eventually take place.

In order to ascertain the action of carbonic
d sea-water on the strength of concrete,
e of experiments were carried out by
is.

sets of briquettes were made up accord-
e German standard rules, one composed
rt by weight of cement to 3 parts by
of sand, and the other 1 part of cement
arts of sand. These briquettes were
to harden twenty-four hours in air,
ected from CO₂, then placed in
distilled water for fifty-six days, the
h which they were kept being hermeti-
cally sealed. Half of the briquettes were
eated with moist CO₂ for thirty-five
hand were finally returned to the
vessel, in which they were kept nine
days longer. When tested, the
riquettes were, therefore, 120 days
e 1 to 3 mortar protected from CO₂
tensile strain of 148 lb. per sq. in.;
e briquettes treated gave 156.7 lb.
n. The crushing strength was 1,699.5 lb.
59 lb. respectively. The 1 to 5 mortar
sile strain of 77 lb. and 92.4 lb. per sq. in.
ushing strength of 616 lb. and 759 lb.
1 to 3 briquettes only 13.3 per cent.
the 1 to 5 briquettes 24.8 per cent.
d lime was converted into carbonate.

ersed in sea-water or a 0.2 per cent.
of magnesium sulphate, the briquettes
ad been protected from the action of
n disintegrated, and even those which

had been carbonated were strongly attacked
in seven weeks, especially the 1 to 5 mortar.

In fresh-water the conditions are more
favourable, for only the free lime can be dis-
solved or converted into carbonate.

The more lime is dissolved out, the more
insoluble are the residual silicates and alumi-
nates. The magnesia which is deposited during
the action of sea-water upon cement mortar
is a preservative agent which tends to close
the pores of the mass. It would be more
correct to speak of the injurious action of the
sulphates in sea-water than to attribute such
action to the magnesium salts, although it is
true that magnesium sulphate is the special
salt which acts in sea-water. The sulphates of
lime or the alkalies, in fact any soluble sulphate,
have the same destructive action, but do not
act with the same degree of energy.

Micheli's finds that those cements which are
richest in lime offer least resistance to sea-
water. A mortar containing free caustic lime
is as unstable from a physical as from a chemical
point of view, as by reactions already explained
great internal strains are produced and expansion
and cracking continues sometimes for
years.

All these defects may be avoided by offering
to the lime, which remains or becomes free
during the hardening process, hydraulic silica
or alumina, with which it can form more stable
compounds. The addition of trass or of an
efficient puzzolana to hydraulic cements
containing an excess of lime, such as Portland
cement, can increase the strength of mortar
very considerably and render them stable in
sea-water. Hydraulic cements which contain
more lime than is required to form stable
hydrosilicates and hydroaluminates should
not be used for marine work unless improved
by the addition of substances, such as those
named.

Sea-water, no doubt, attacks unset cement,
for, if a pat of cement be placed in it im-
mediately after gassing, in a short time magnesia
will be found to be deposited, and the surface
of the pat will be soft, while the inside will
be perfectly hard.

This would point to the advisability of using
a quick-setting cement for sea work, so as to
allow of as little action as possible. It has
been sufficiently proved that sea-water, when
allowed to pass through concrete, has a destruc-
tive action; but it has also been conclusively
proved that, if the concrete is made dense so
as to present as little surface as possible to
the action of the sea-water, there is not much
to fear from the action of the latter.

As set and dense concrete is but little acted
on by sea-water, the block method of con-
struction appears to be the best. The sack
method adopted by Mr. Carey at Newhaven,
is no doubt good, as it keeps the concrete in a
dense mass till set, but, as Mr. Carey himself
remarks, in the use of large masses by this
system a great deal depends upon the rapid
mixing of the concrete so that the sack may be
placed in its allotted position before setting
commences, otherwise not only will it not
settle down in its place properly, but the
strength and homogeneity of the mass will
be impaired.

LAGOS MAHOGANY.

In the annual Blue Book for the Colony
of Lagos for the year 1903, it is remarked
that the timber industry may be said to have
had its inception in 1897, when 275 logs,
valued at 1,722*l.*, were exported. This in-
dustry, which has now become an important
one, is subject to very considerable fluctua-
tions, as may be seen from the following
figures, which represent the exports of timber
for the last five years:—1899, 7,680 logs, value
34,738*l.*, or an average of 4*l.* 10*s.* 5*d.*; 1900,
15,250 logs, value 58,574*l.*, or an average of
4*l.* 8*s.* 1*d.*; 1901, 4,540 logs, value 12,216*l.*,
or an average of 2*l.* 13*s.* 10*d.*; 1902, 12,049
logs, value 33,292*l.*, or an average of
2*l.* 15*s.* 3*d.*; 1903, 15,785 logs, value 56,167*l.*,
or an average of 3*l.* 11*s.* 2*d.* The market
value, as shown by these figures, varied
largely, and there can be no doubt that the
high prices obtained in 1899 and 1900 stimu-
lated this trade to such a degree that a great
many immature trees were brought into the
market, and hundreds or thousands of logs
that were found to be unsaleable were left to
decay and rot in the forests and rivers of the
territory. The destination of the timber ex-
ported during the two last years has been:—
1902, to Germany, 1,261 logs, value 3,939*l.*;
to Great Britain, 10,652 logs, value 28,846*l.*;
to New York, 136 logs, value 507*l.* In 1903,

to Germany, 1,323 logs, value 3,600*l.*; to Great
Britain, 14,170 logs, value 51,850*l.*; to New
York, 287 logs, value 517*l.* Many immature
trees are still being cut down and wasted, to
no present profit, but to the great prejudice
of the future. All the forests are native pro-
perty, and practically all are at present
beyond the direct jurisdiction of the Colonial
Government. Efforts that were made to
regulate the industry so as to protect the
forests from the waste and mismanagement
that still go on were, to a large extent, frus-
trated, and the forest law that was passed by
the Legislature is, in the form in which it
had to be promulgated, quite inadequate to
preserve the forests. The only really valuable
remedial measure that has been applied, is
the setting apart of considerable forest
reserves, which have been put by the native
owners into the charge of the Colonial
Government for a period of fifty years. This
will at least preserve a sufficient number of
hardwood trees to supply seed for future
planting. Unless the forests are brought
under the control of the Government in a
way that is not the case at present, it would
be futile to look upon the timber industry as
a permanent one of important dimensions. It
is but too manifest that the forest area is
being steadily reduced by the inroads of the
farmer. This is more particularly noticeable
in the central districts. The forest soil is
richer and more fertile than land that has
been recently cultivated, and there is thus
a strong temptation to constantly clear and
plant new fields at the expense of the forest.
At the same time the natives have a great
love for trees, and one of their very best
instincts is the planting and preserving of
numerous beautiful shade trees in their towns.
But they have not yet learned generally the
importance and the great value of the forests
in retaining moisture and providing perma-
nent articles of export, if prudently managed.
In fact, the idea of forest management is
new to them, and much time and patience is
required to bring this home to the native
mind. In many parts of the country only the
hardwood tree has been left standing to indi-
cate to the observant traveller that at no
very remote date a much greater area than
at present was covered by forest, all of which
has been cleared away and destroyed, except
the great and beautiful "Iroko" tree, which
has been spared through the fact that some-
wise and thoughtful priest dedicated that
tree to a sylvan deity, whose abode it is, and
whose living temple has thus escaped the
hand of the destroyer until now, when it is
being cut down in the interest of trade.
What is most required at present is a stringent
general law to prevent the cutting down of
immature hardwood trees.

METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of the
Managers of the Metropolitan Asylum Dis-
trict was held on Saturday last week at the
offices of the Board, Victoria Embankment.

Among a large correspondence received from
the Local Government Board were letters
sanctioning the following, among smaller
works:—Enlargement of workshops at the
Western Hospital, 285*l.*; additional male staff
mess-room and store accommodation at the
Western Hospital, 595*l.*; works in connexion
with the laundry at Leavesden Asylum, 1,800*l.*;
alterations and additions at Belmont Asylum,
1,750*l.*; fire exits at the South-Western and
Eastern Hospitals, 169*l.*; cottages for married
attendants at Leavesden Asylum, 350*l.*; addi-
tional infirmary accommodation for imbeciles
at Leavesden and Caterham Asylum, 1,825*l.*;
and additional storeroom accommodation at
White Oak School, 275*l.*

Southern Hospital.—The Works Committee
reported that they had authorised the issue on
the contractors, Messrs. Johnson and Co., of
orders for sundry extra works amounting in
value to 185*l.* 16*s.*

Tooting Bee Asylum.—On the recommenda-
tion of the Committee, Messrs. Fowler and
Hugman were appointed to take out the
quantities of the proposed additional build-
ings at Tooting Bee Asylum.

North-Western Hospital.—The Board ap-
proved and adopted a plan, prepared by the
Engineer-in-Chief, of a cottage for the resident
engineer at this hospital. The estimated cost
of the building is 500*l.*

Leavesden Asylum.—The Asylums Com-
mittee submitted a report by the Engineer-
in-Chief on the working of the water-
sterilising and softening apparatus which has
been installed at Leavesden Asylum. The
conditions of the contract had been complied
with in all particulars except that of the
softening of the water. The contract re-
quired that the hardness of the water should
be reduced to 7 deg., but, as yet, the apparatus
had reduced it to only 9½ deg. The

contractors, however, considered that the softening of the water would improve, and had agreed that the plant should be put into ordinary working practice for three months. This agreement was accepted.

OBITUARY.

MR. HUNT.—The death is announced of Mr. Henry Arthur Hunt, of the firm of Messrs. Hunt and Steward, of No. 45, Parliament-street, Westminster, surveyors, and of No. 19, Warwick-square, Piccadilly. Mr. Hunt died at Ponza on September 26, aged sixty-eight. He was a son of the late Sir Henry Arthur Hunt, C.B., who, during a long period, was Consulting Surveyor to H.M.'s Office of Works. On leaving Westminster School Mr. Hunt adopted the profession of surveyor, and having received some practical training in Thomas Cubitt's workshops, and in the offices of Philip Hardwick, the architect, he entered his father's office. He was the honorary architect of the new junior school at Clapham Junction for the Royal Masonic Institution for Girls, 1902-3; his firm were, we believe, architects of the buildings on the Thames Embankment for the Thames Conservancy, and in Regency-street, Westminster, for the Canteen and Mess Co-operative Society. Mr. Hunt was a Fellow of the Surveyors' Institution, and held the appointments of surveyor to the Royal Commissioners for the Exhibition of 1851, the Paddington Estate Trustees, the Dean and Chapter of Westminster, the Corporation of the Sons of the Clergy, and the Chelsea property of Lord Cadogan. He took an active part in the management of several of the Westminster eleemosynary and educational charities, and was a Governor of the Emanuel, Greycoat, and United Westminster Schools. He served on the House Committee of the Royal Masonic Institution for Girls, and in recognition of his services to the craft was, in 1891, raised by his present Majesty, then Grand Master, to the rank of Past Grand Superintendent of Works.

GENERAL BUILDING NEWS.

NEW BOARD-ROOM FOR THE SOUTH SHIELDS UNION.—The extensions and improvements which have been carried out at the South Shields Union offices in Barrington-street have now been completed, and the new board-room for the Guardians has been opened. The new buildings comprise, on the basement floor, an applicants' waiting-room at the rear, with offices for relieving officers adjoining. The entrance to the ground floor is by a hall, approached from Barrington-street, on the left of which is the old board-room, which has been converted into rate collectors' and overseers' offices, registrars' office, and waiting-room. Rooms are also provided on the ground floor for the vaccination officer, superintendent relieving officer, etc. On the first floor are the clerk's, general, and private offices, committee-room, etc., and at the rear is the new board-room, 36 ft. by 28 ft. It has a barrel vaulted roof, the ceiling decorated in white and gold, and a dado panelling of oak. The main staircase is constructed of concrete, with ornamental metal balustrading, and is lighted from the roof. There are rooms for the caretaker, and store-rooms on the second floor. Two fire-proof rooms are provided for the storing of books and documents. The work has been carried out by Mr. J. C. Nichol, contractor, South Shields, from designs prepared by Mr. J. H. Morton, architect, South Shields.

PUBLIC LIBRARY AND HALL, HATTON, N.B.—The foundation-stone of the new Hatton Public Library and Hall was laid a short time ago. The building is to have a frontage of 50 ft. On the ground floor will be a lending library and reading-room, each 28 ft. long by 20 ft. broad, also ladies' and gentlemen's waiting-rooms, cloak-rooms, etc., with a vestibule. Above is to be the hall, 51 ft. long and 23 ft. wide, exclusive of a gallery, and which will accommodate 350 people. In addition, there is to be a sunk floor, in which there will be a kitchen and heating chamber, the lending library, reading-room, and hall being heated by hot-water pipes. Ordinary fire-places will be provided in the waiting-rooms. The building is to be erected of rubble blocks, while the front is to be of sneaked ashlar; and the inside is to have pitchpine flooring, lining, and finishings. The contractors for the work are—Mason work, Mr. Edgar Gall, Aberdeen; carpenter work, Davidson and Son, Hatton; slater work, James Greig, Peterhead; plaster work, Alexander Kelman, Peterhead; plumber work, John Davidson, Peterhead. The architect is Mr. William Davidson, of Ellon.

RENOVATION OF PARK CHAPEL, CROUCH END.—The work in connexion with the renovation of the interior of this church has now been finished, and the building was recently reopened after having been closed for several

months. The work has consisted of re-colouring the woodwork with a lighter tint. The walls are light green in the upper parts, with a dado of dark green near the ground, and a border of salmon hue round the windows. The ceiling is cream colour, and the wooden beams are two shades of light oak. Messrs. J. Grover and Sons, of Islington, were the general contractors. New heating apparatus has been installed by Messrs. Rosser and Russell. The method of heating is by hot water at low pressure and in three circuits. Ordinary gas lighting has been replaced by the electric light, by Messrs. Duncan, Watson, and Co. The ventilation has been attended to, and electrically-driven fans have been inserted in the roof. The plans for the improvements were prepared by Mr. Alfred Conder, architect, and the cost has been 1,200l.

FEVER HOSPITAL, SEACROFT, LEEDS.—A new fever hospital near Seacroft has just been erected for the Leeds Corporation. The foundations of the present buildings were laid in 1900, and now there are some forty blocks ready for immediate use. The hospital buildings cover 42 acres, and are built on the one-storied-pavilion principle, and connected by means of covered ways. There are more than twenty of these pavilions, each containing thirty beds. Eight pavilions are set apart for scarlet fever cases, four for diphtheria, and four for enteric, whilst others are to be used as observation and convalescent wards. The pavilions are raised on arches 5 ft. above the ground. A total of 452 cases can be treated at one time, these being made up of 240 scarlet fever cases, sixty diphtheria, 104 enteric, and forty-eight isolated cases. In the administrative and residential blocks accommodation will be provided for 100 nurses and seventy female servants. The male staff will number over thirty, and there will be sixteen cottages for married servants. The main contract was obtained by Messrs. H. Arnold and Sons, of Doncaster, for 198,000l. Mr. E. T. Hall, of London, has been the architect, with Mr. A. Turner, of the Corporation, clerk of the works.

SCHOOL, ABERAVON.—The new Aberavon infants' school was opened recently by Dr. Morris, the Chairman of the Glamorganshire Education Committee. The school is situated facing the Causeway, and is built of red pressed bricks, with Bath stone dressing. It has two entrances—one in the Causeway and one in Charles-street. The building consists of entrance-hall, cloak-room with lavatory, mistress's room, corridor, and four classrooms, which have accommodation for 204 children. The playground consists of two levels, in all about 1,000 yds. square. The entire cost of the building was 3,000l. The architect for the schools was Mr. J. A. James, Port Talbot, to whose plans the work was carried out by Mr. E. G. Groom, contractor, Aberavon, the clerk of the works being Mr. J. Williams, Taibach.

CHURCH, MIDDLESBROUGH.—On the 28th ult. the Archbishop of York (Dr. MacLagan) dedicated the new district Church of St. Michael's and All Angels, which has just been erected in Waterloo-road, Middlesbrough. The new building has been erected at an approximate cost of 6,000l. On the ground floor is a parochial hall, 57 ft. by 44 ft. The vestries and committee-rooms are on the same floor, and have a staircase leading to the church, which is on the second story. Lavatories and cloak-rooms are provided in connexion with the hall. The church proper is 96 ft. by 44 ft., and is approached by a wide open staircase. The seating throughout is of pitch-pine. The building is of common brick, with ornamental brick and stone dressings, and has been erected by Messrs. Easton Brothers, contractors, of Middlesbrough. Mr. William Duncan, of Middlesbrough, is the architect.

ISOLATION HOSPITAL, NEAR HEREFORD.—The Hereford Rural District Council, with which the neighbouring authority of Weobley has combined for isolation purposes, have erected a new hospital on land at the extreme end of Stretton Sugwas parish, bordered by outlying portions of Burghill, Credenhill, and Tillington. The principal building is the isolation hospital and wards for the reception of infected patients; and the male and female wards are placed on either side of the main entrance. These are 25 ft. by 25 ft., and 13 ft. high. The walls and ceilings are coated with granite silicon plaster. Attached to each ward are annexes with necessary slop sinks, and closet arrangements. The floors of the hospital are of cement concrete, and the wards are warmed by grates having slatted tiles. Between the two wards is the nurses' duty-room, having fixed inspection windows overlooking both wards. Attached to the nurses' room are a scullery and larder and office. A bath is provided in the main hall, and also a linen stores. In close proximity to the isolation hospital is situated the residence for the nurses and caretaker.

The discharge block consists of an inward, a bath-room for medicated bath discharging patients, and a disinfectant. The range of outbuildings comprise a house, disinfecting chamber, coal-house, and mortuary. The whole of the building throughout have been erected with red bricks, relieved with buff brick string courses and arches; the roofs are all boarded and covered with best Broseley and the walls are cavity walls. Each of four buildings has tanks in the roofs supplied with the pure water from a well. Rain-water tanks underground are provided for the respective buildings. The buildings have been carried out under the direction and superintendence of the architect, Mr. G. Davies, the builder being Mr. C. Cooke. The total amount of the contract was 2,050l.

COMPLETION OF EDINBURGH NEW COURTS BUILDINGS.—The new County Buildings, Edinburgh, which have been erected by the Edinburgh Corporation, Parliament-square and Melbourne-place, have now been completed, and will be opened in the autumn. The buildings are in the style of the English Renaissance, and the total cost has been 40,000l. The architect is Mr. McIntyre Henry, Edinburgh, and the contractor was executed by Mr. W. Birnie & Co., Glasgow.

WESLEYAN CHURCH, FROCKTON-ON-THE-HILL, N. WESLEYAN CHURCH AND SCHOOLS, OF BRADFORD.—The new Wesleyan church and schools, of Bradford, are the architects, was opened recently. The building is situated in Yarrow-street, is of stone, with tower and spire, and tracery windows filled with leaded lights. Accommodation provided is for 660 pupils, 33 on the ground floor and 230 in the galleries, which occupy three sides of the church. The interior woodwork of pews and roof is pitch-pine, the rostrum and communion furniture being of walnut. The building is heated by low-pressure hot water, and is lighted throughout with electricity. The schools in the rear of the premises comprise a large assembly hall with a stage, a gallery, an infants' room, a ladies' parlour, and thirteen classrooms. The cost of the buildings is about 7,800l.

WESLEYAN CHURCH, LUTTERWORTH.—The memorial-stones have just been laid of the new Wesleyan church at Lutterworth. Mr. J. Lambert, Nottingham, is the architect, and the contractors are Messrs. T. Barlow and Sons, of Nottingham, and Mr. J. Hewins, of Lutterworth, clerk of works. The building, which is expected to cost about 3,500l., will be seating accommodated in the chapel proper for about 250 people. There will be transepts on either side of the minister's vestry, a schoolroom to accommodate 200 scholars, a large classroom, which will be divided into two, and a classroom adjoining the schoolroom, also kitchen and necessary buildings. The bricks used in the building are of the best, and the site is expected to cost about 3,500l. There will be seating accommodated in the chapel proper for about 250 people. There will be transepts on either side of the minister's vestry, a schoolroom to accommodate 200 scholars, a large classroom, which will be divided into two, and a classroom adjoining the schoolroom, also kitchen and necessary buildings. The bricks used in the building are of the best, and the site is expected to cost about 3,500l. There will be seating accommodated in the chapel proper for about 250 people. There will be transepts on either side of the minister's vestry, a schoolroom to accommodate 200 scholars, a large classroom, which will be divided into two, and a classroom adjoining the schoolroom, also kitchen and necessary buildings. The bricks used in the building are of the best, and the site is expected to cost about 3,500l.

SUNDAY SCHOOL, NEAR WHITBY.—The memorial-stones and memorial-bricks were laid recently for the new Sunday school in connexion with the Sleights and Briggs (near Whitby) Wesleyan Methodist Church. The school and vestry, etc., are being erected at the back of the site upon which the church is to be erected, and it will be of brick, relieved with stone dressings, covered with tiles. The internal dimensions of the school are as follows:—Length, 19 ft. 6 in. The projected church, which is to be erected on the site of the old chapel, will be built of stone covered with slates. In the interior the floor is divided by a centre aisle. The woodwork will be of pitch-pine, and the whole of the tracery windows will be filled with leaded lights. The church is estimated to seat 200 people. The total estimated cost of the school and church is 1,175l. Mr. A. E. Y. of Whitby, is the architect, and Mr. J. J. son, of the same place, is the contractor.

MEMORIAL HALL, LIVERPOOL.—The foundation-stone of the new central hall of the pool Wesleyan Mission, erected as a memorial to the Rev. Charles Garrett, was laid on the 28th ult. The new building has been designed by Messrs. Bradshaw and Gass, architects, Bolton, and will contain two halls, to accommodate 2,500 people in full view of a platform, and the other to seat about 100. The latter will be arranged with tiered seats at the back, and will be adapted

school work. There will also be reading and chess halls, classrooms, rooms for social work amongst both sexes, a drill and administration offices. The main hall is to be through a wide vestibule to the central tower, and the two others the Corporation gardens to be laid out on the site of the Unitarian Burial Ground in pleasant, and from Upper Newington. Provision is made in the main hall for an organ. Shops with show-rooms for offices will be placed in the main part of the Renshaw-street and Upper Newington frontages. The total cost, with fittings and organ, is estimated at 37,250*l.*

WESLEYAN METHODIST CHURCH, STOCKTON.—The 29th ult. a new Wesleyan Methodist church was opened in Yarm-road, Stockton. The new church, which is built in the Gothic style will cost nearly 10,000*l.* The architect is Mr. H. Mozley, of Bradford.

CHURCH, BRADFORD.—On the 29th ult. the foundation-stone was laid of the new Church of the Holy Trinity, which is in course of erection in the district of the city of Bradford. The architect of the new building is Mr. Temple Moore, of London. Seating accommodation will be provided for 620 persons. The work is being carried out by Messrs. Thompson and Co., of Bradford.

WESLEYAN CHURCH, BRIGHTON, SHREVEPORT.—The memorial-stone was laid recently of a new Wesleyan church which is being erected at Brighton. It is estimated that the building will cost about 2,300*l.* The architect is Mr. W. C. Jackson, and the contractors are Messrs. Lund and Swann, of Ekeington.

COLLEGE, LEITH.—The foundation-stone of the new College of St. Barnabas at Leith was laid a short time ago by the Bishop of Raphoe. The building will be in the Gothic style, and amongst the prominent features are four round towers projecting from the exterior angles of the quadrangular plan, and the inner courtyard, surrounded by an open cloister and corridor, with stone columns and circular-headed tracery. The elevations are broken by stone gables and irregular embattlements along the eaves, with running mouldings, and at intervals by projecting Celtic carvings and sculptures. The contract for the work has been entrusted to Messrs. Lavery and Son, Belfast, and the architect is Mr. Thomas F. McNamara, of Belfast.

METHODIST CHURCH, EAST FINCHLEY.—The foundation-stones of the new Wesleyan Methodist church, which is now built in High-road, East Finchley, were recently laid. The design of the building is by Mr. J. H. St. John, and the front elevation having Bath stone and a traceried mullioned window in the end, while a porch and vestibule, projecting from the main wall, occupy the lower part of the design. The interior has an intricate roof, plastered walls, and an ornamental rostrum of bronze-green colour finished, which fills up a semi-octagonal space at the end of the building, while lavatories, and scullery are also provided. Accommodation will be afforded for 400 persons. The architects were Messrs. Mence, and Houchin, the builders being Messrs. T. D. Steed and Sons.

LIBRARIES FOR LEWISHAM.—The Local Government Committee of Lewisham Borough Council reported on Tuesday that, upon the recommendation of the committee, the purchase of the site for the new branch library, they invited designs from local architects for the erection of the building at a cost not to exceed a total of 4,500*l.* One of the fifteen selected architects sent in a plan, and that which was numbered nine was the one which was chosen. The sum of 4,500*l.* was subject to a *bona-fide* tender being submitted within the specified limit from a suitable contractor. The 4,500*l.* is to include fittings, and architect's and quantity surveyor's fees. With regard to the proposed site of a public library at Hither Green, the Local Government Committee has decided to apply to the Lewisham County Council to convey their land in Mountfield so that the building may be adapted for a library. If that can be done the site could be used for library as soon as funds are available.

CHRIST CHURCH, WORCESTER.—The foundation-stone of the new Christ Church, Broadheath, was recently laid by the Bishop of Worcester. The new church is situated near the junction of the canal and the schools, near the road. It comprises chancel, nave, and porch, with arches between it and the school, and a tower of future extension by a north aisle, porch, and a tower upon the nave level, choir, and organ case in a gallery, which is approached by a staircase from the porch. Above the gallery are the clock and bell chambers, reached

by turret stairs from the south-east corner of the tower. The church is built throughout of red stone from Lord Dudley's quarries at Holt. The font and cover were carved by Mr. Haughton, sculptor, of Worcester, and, together with the other furniture, were designed by the architect; the gallery front and altar rails by Messrs. Collins and Godfrey, Tewkesbury; and the remainder of the oak furniture by Messrs. Braithwaite, of Worcester. The builders were Messrs. Collins and Godfrey, Tewkesbury; the foreman of works was Mr. E. B. Smith, Bedford. Mr. C. E. Ford Whitecombe, of Winchester House, E.C., and of Newbury, Broadheath, was the architect.

TEMPORARY STRUCTURE, LUTON.—The building which was erected at Luton for the purpose of providing accommodation for the recent political meeting held there was designed by Messrs. Martin and Martin, architects, of Birmingham. The total interior area was 200 ft. by 135 ft., and the roof was constructed by Messrs. McTear and Co., Belfast.

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AGRICULTURAL AND FISHERIES BOARD.—The Agricultural and Fisheries Board, represented the Board of Trade. Mr. B. Francis-Williams, K.C. (instructed by the town clerk), appeared to support the Corporation scheme, which is for an outlet at Brynmill. Mr. B. Francis-Williams said there were at present five outfall sewers, and the projected one would serve a population of about 7,000 at Brynmill. The Local Government Board in 1890 sanctioned the scheme, but pointed out that the consent of the Board of Trade would have to be obtained, and this consent was subsequently refused, owing to the apprehended pollution of the oyster beds at the Mumbles. It would be shown that the danger was an imaginary one, for the sewage matter would be dealt with in septic tanks, and would be discharged only when the tide was going seaward. Mr. Wyrill, Borough Engineer, said the Council, after full consideration of various schemes, were firmly of opinion that the Brynmill scheme, combined with the septic tank accommodation for 212,000 gallons of sewage matter, was the best scheme.—There is considerable opposition to the scheme, and Mr. Wyrill was cross-examined at length.

FOREIGN.

GERMANY.—The town of Bremen has opened an international competition for the most artistic architectural designs for a block of houses to be erected in the Kaiser Wilhelmsplatz, facing the town hall. Prizes of 5,000 marks (about 250*l.*), 3,000 marks (about 150*l.*), and 2,000 marks (about 100*l.*) are offered for the best designs.—The United States Consul at Mainz reports that a Hamburg firm have patented a process for manufacturing an artificial building stone from infusorial earth, which they call "Guhrolit." This stone is very light, is fireproof, withstands the influence of most chemicals, and can be easily sawed, nailed, and bored.

MISCELLANEOUS.

LINCOLN BUILDING BY-LAWS.—A meeting of the Lincoln City Council was held on the 4th inst., when Mr. Bainbridge called attention to the passing by the Building Committee of plans with outer walls of only 4½ in. Mr. Mills maintained that, being in a passage, the walls in question were not outer walls. A long discussion ensued, the labour members of the Council favouring the 4½-in. walls on the ground that it would mean more rent for the working men if 9-in. walls were insisted on. The Mayor said the building by-laws of the City were very antique, and very much easier than any new by-laws could possibly be. He could not help expressing the opinion that it would be a great mistake to make them easier. For working men to believe their good interests were served by putting up buildings which could not stand as long as they ought to stand, seemed to him very much like encouraging the erection of buildings of the class which they were trying to abolish, and which he hoped would soon be swept away. Alderman E. Pratt moved that the plans in question be referred back to the Committee, and this was carried by fourteen votes to seven.—Yorkshire Post.

FINLAND TIMBER.—It appears from official statistics that in the year 1903 there were exported from the Grand Duchy of Finland deals to the value of 780,840*l.*, battens to the value of 1,334,600*l.*, and boards to the value of 1,665,820*l.* It has long been known that the "Enare Lapmark" possesses great wealth in its immense forests. They have stood untouched for centuries up to the present without any careful supervision, but, at the same time, free from the wood-cutter's axe. In this district there was only one forest inspector and a few foresters, whose duty it was merely to prevent the illegal felling of trees, and to protect them against fire, and up to the present it has been almost a necessity to leave these valuable forests untouched, on account of their remoteness and want of suitable rivers to float the timber southwards. It has now been decided to commence a rational exploitation of these vast forests, containing about 10,000,000 of large trees. On account of the slow growth in this northerly region, an average age for full-grown trees has been calculated at 250 years, with an average height of about 55 English ft. About 100,000 trees are now to be sold by public auction as a trial, and the timber will have to be floated through the Patsjoki Lake, on the Finnish Frontier, to Varanger Fjord in Norway. It can also be floated through several Finnish lakes and rivers to the Murmur coast, on Russian territory. This experiment by the Finnish Government to open the forests in the "High North" will certainly be of great interest to saw-mill owners. Swedish and Norwegian companies

SANITARY AND ENGINEERING NEWS

THE DRAINAGE OF SWANSEA.—A Board of Trade inquiry was held at the Town Hall, Swansea, recently, respecting the proposed sewerage outlet for the western district of Swansea. Mr. William Matthews, C.M.G., M.Inst.C.E., assisted by Mr. Fryer (of the

are already making inquiries with regard to the time of sale, yet it is improbable that Finnish speculators will avail themselves of this fact, as no Finnish firm at present carries on any timber export from the Arctic Sea, though Swedish, Norwegian and Russian exporters have great experience in floating and exporting timber from that northerly region. At a meeting of saw-mill owners, the chairman said he had received accounts from eighty-six mills, with a production of over 300,000 standards. The quantity remaining unshipped, although sold, was 90,579 standards, against 91,331 standards in 1902. An agreement has been arrived at amongst the producers that next winter there shall be a further reduction of 10 per cent. in the number of trees to be felled.

APPOINTMENT.—The question of appointing an architect for carrying out the Leeds Workhouse Extension scheme was discussed by the Leeds Guardians on the 21st ult. Mr. Richardson had given notice of a motion on the subject, but the Chairman (Mr. Arthur Willey) raised a direct issue by proposing the appointment of Mr. Thomas Winn. The resolution having been seconded, Mr. Richardson moved a direct negative to the Chairman's proposition, but afterwards varied his amendment to one adjourning the appointment for a month. This was seconded by the Rev. Father Corr, but it was defeated by nineteen votes to thirteen. On the substantive proposition Mr. Winn be appointed, the voting was evenly divided—sixteen for and sixteen against—and the Chairman gave his casting vote for the motion. Mr. Winn was therefore appointed.

SELF-WINDING ELECTRICAL CLOCK. We had an opportunity last week of inspecting a self-winding clock, which is being put on the market by The Self-Winding Clock Syndicate, of Audrey House, Ely-place, London. A self-winding clock, to be of any real use, must be a very accurate time-keeper, otherwise there is practically nothing gained, as constant attention will be required for the purpose of regulating the hands. The accuracy of such a clock must be of a far higher order than those in everyday use. An inspection, however, of the clocks of this type which we were shown has convinced us that they can be made so that they keep time much more accurately than ordinary clocks. The winding is done electrically every five or six minutes, the necessary power being obtained from two small dry cells. The main spring is of the helical type, and is distinctly novel. Its elasticity will alter much more gradually than the elasticity of the ordinary flat spiral spring. Its extension is very slight compared with its length, and thus the "elastic fatigue" will be infinitesimal. The rate of the clock can be adjusted very accurately by simply turning a screw. We see no reason why the primary batteries should not be able to keep it going for several years. The novel points in the design of this clock should make it popular, especially if it prove to be an accurate time-keeper.

DOUGLAS'S PATENT SIPHON CISTERN.—The illustration shows the section of a siphon cistern patented by Mr. J. P. Douglas (Workington, Cumberland). The water is admitted by a ball-tap arrangement in the usual manner, and, in filling, the cistern imprisons and compresses to a certain extent the air in the air bell D. The imprisoned air prevents the water from rising to the level of the siphon inlet contained in the air bell. To empty the cistern the air escape valve or push is pressed. This releases the air from the air chamber, and the atmospheric pressure on the water in

the cistern forces the water up to the level of the siphon inlet enclosed in the air bell. The water rushes down the outlet pipe, and the suction so caused brings the main siphon B into play. A double siphonic action is thus secured, and the consequent increased pressure, it is claimed, gives a powerful and complete flush. The further advantages claimed for the cistern are:—(1) It cannot overflow; (2) the absence of the chain pull wear and tear, reduces the cost of the maintenance and repairs to a minimum; (3) the parts, being stationary, can all be made of non-corrosive metal; (4) the cistern is noiseless in action; (5) the air escape pipe, being of small diameter, can be let into the wall or encased in wood. We may add that we are not responsible for the mis-spelling, "siphon," in the references, which form part of the block furnished to us by the patentee.

OPEN SPACES.—A body, consisting of nine conservators, has been appointed to frame a code of by-laws for the preservation of the Oxshott woods and common, in the parish of Stoke D'Abernon, Surrey, which are being gradually despoiled of their natural beauties at the hands of "trippers," holiday-makers, and others. The land, which formerly belonged to Waverley Abbey, appertains to the manor of Clarendon, and the Duchess of Albany will be represented upon the new board by her Controllor, Sir Robert Collins, K.C.B., whilst Mr. John H. Clutton will act in a similar capacity on behalf of the Woods and Forest Commissioners. The Lambeth Borough Council have expressed their willingness to contribute 2,000*l.* towards the purchase of the 6 acres of meadow land in Trinity-road, by the south side of Brockwell Park, when the remaining sum of 10,000*l.* shall have been raised. The proposed addition would, so far as is now possible, preserve all the land which forms a natural boundary of the park and prevent that side of it from being blocked in with rows of small houses; the owner, it is stated, received an offer of 15,000*l.* for the land for building purposes, but is willing to meet the promoters' object by taking 12,000*l.* In response to the appeal of Miss Octavia Hill and Canon Rawnsley for the acquisition, at a price of 12,000*l.*, of 700 acres on the shore of Ullswater Lake, with Gowbarrow Park and Fell, and the Aira Force, or cascade, a sum of 100*l.* is offered by "Stroller," provided that nineteen similar donations are forthcoming. Of the nineteen individual donations fifteen are already promised, amongst other contributors are Mrs. Charles Buxton (100*l.*), and Mr. Alfred Waterhouse, R.A. (20*l.*). The property is offered to the National Trust by Mr. Henry Howard, of Greystoke Castle.

THE LABOUR MARKET IN THE COLONIES.—The October circulars of the Emigrants' Information Office state that in *Canada* the supply of mechanics and general labourers is quite sufficient, and the emigration of such persons is not recommended, especially as the winter season is coming on. In *Australia* there is a demand for experienced farm labourers in Western Australia, Queensland, and parts of Victoria, but there is little demand anywhere for more miners, mechanics, or general labourers. Late reports from New South Wales state that, owing to the severity of the late drought, and the numbers of the unemployed, no one without capital should emigrate to New South Wales at the present time. In *New Zealand* employment has been good, and skilled mechanics should be able to obtain work without waiting long. In *Cape Colony* there is now no opening for

mechanics in the building or other trades, all persons (especially general labourers) wanted amongst going at the present time unless they go out to situations engaged by them, or have means of their own sufficient to keep them for some months. But in Cape there is no opening for indifferent men. The building trade in *Natal* has fairly busy, but labour is plentiful, and numbers of unskilled workers and indolent workmen are unable to obtain employment. Emigrants, therefore, other than those going nominated passages, are warned against going to Natal at the present time on a chance of work. No one can enter *Transvaal* without a permit, and persons warned against going there at the present time in search of work. There is no import in trade. In the *Orange River Colony* there is very little demand for mechanics, and none at all for second-hand or general labourers. It is officially notified that, in view of the large number of candidates already registered, no further applications for appointments under Government of the Orange River Colony be entertained.

SCHOOL OF ART WOODCARVING.—The School of Art Woodcarving, South Kensington, which now occupies rooms on the floor of the new building of the London School of Art, near work in Exhibition-road, has been reopened after the summer vacation, and we are requested to state that some of the free student maintenance by means of funds granted to school by the London County Council is vacant. The day classes of the school held from 10 to 1 and 2 to 5 on five of the week, and from 10 to 1 on Saturday. The evening class meets on three evenings a week, and on Saturday afternoons. For application for the free studentships any further particulars relating to the school may be obtained from the manager.

ENGLISH CRAFTS AT THE ST. LOUIS EXHIBITION.—We have received a catalogue a pamphlet of photographs of work done by "Craft School" (an Evening Art and Technical School) in Globe-road, Bethnal Green, which has been contributed to the St. Louis Exhibition. Judging from the photographs the work done, especially in woodwork and repoussé metal, appears to be very good and a credit to the school. The prospectus of the school states that the object of teaching is educational; to develop creative faculty of the pupil and his power of appreciation. The crafts are taught, not separate trades, but as various modes of expression; and the same boy always designs and carves it out in the appropriate material. All this seems very factory.

ARCHAEOLOGICAL DISCOVERIES.—During various by Corporation workmen at Newbury-under-Lyme, the foundation of part of a castle built about 1180 was discovered. The corner wall of plinth courses has been bare to the extent of 10 ft. or 12 ft., each and to a depth of 3 ft. The wall is of red sandstone. The excavations are continued and the walls traced.

Legal.

AN ARCHITECT'S CLAIM FOR PROFESSIONAL SERVICES.

At the Clerkenwell County Court on 29th ult., Mr. E. A. Agutter, architect, Messrs. Levy and Co. for 25*l.* due in respect of professional services. Mr. Walter Stewart appeared for the plaintiff, Mr. Green for the defendants. The case was heard before a jury.

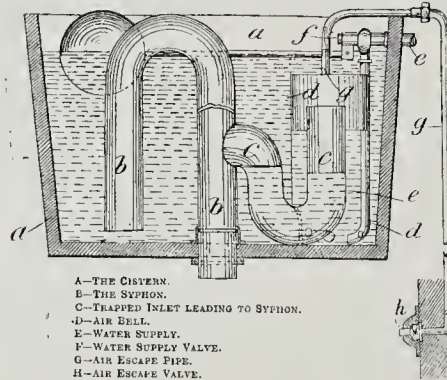
The plaintiff's claim was for services rendered in connexion with repairs at the defendants' premises, 2, Pitfield-street, Hoxton, which a builder's estimate of 150*l.* was given. Subsequently further work was required, amounting to an expenditure of 550*l.* The work was then abandoned, and on plaintiff applying for his fees he received a law letter in which the defendants denied him any instructions for the plans. In the course of the evidence plaintiff stated that he could never get written instructions from the defendants, who said that was not their way of doing business.

Mr. Lovegrove, District Surveyor, gave evidence in support of the plaintiff's claim in accordance with professional custom.

The solicitor for the defendants was called and produced a letter written to him by the defendants in reference to rebuilding the premises. In this they said they had instructed plaintiff to prepare plans.

Mr. Stewart: Then I need ask you not else.

Mr. Green consulted with his clients, the result that twenty guineas and costs were offered and accepted, and the jury withdrew.



A—THE CISTERN.
B—THE SIPHON.
C—TRAPPED INLET LEADING TO SIPHON.
D—AIR BELL.
E—WATER SUPPLY.
F—WATER SUPPLY VALVE.
G—AIR ESCAPE VALVE.
H—AIR ESCAPE VALVE.

Douglas's Patent Siphon Cistern. Section.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*
 5 of 1903.—A. TIXIER and L. RAMBAUD: *Process for the Manufacture of Varnishes the Direct Solution of Gums without previous Fusion.*

Process of manufacture of a solvent of, consisting in causing an acid to act on spirit of turpentine, on agitation, so as to cause terpeneol directly, or to produce terpeneol which is afterwards transferred into terpeneol by the action of dilute sulfuric acid, spirit or turpentine, benzene, or of a similar substance being afterwards added to the terpeneol obtained in one case or the other.

of 1903.—W. FAIRWEATHER (G. 3. 3): *Mixing Machines for Concrete and other Materials.*

Concrete mixing machine, comprising a vertical drum having a lateral feed and a large opening therein, means for revolving said drum, and means for performing mixing, said means comprising a central shaft, arms on said shaft, and mixing blades on said arms adapted to scrape the material from the sides of said drum and discharge it at the centre thereof.

of 1903.—C. J. HART and W. FINCH: *Swinging Apparatus for Swinging and other uses.*

Invention has reference to closing apparatus for swinging and other doors, the door being to cause such doors to come always when swung to a definite central closed position without shock or jar. A door box is formed, preferably circular and of suitable depth, and to the inside bottom of said box is fixed a circular plate, or an inclined piece, with a race for balls, rollers, or the like, the same being kept in the race by a pivot, or other suitable means. The pivot or other which fits the bottom of the door, upon which the same turns, passes through the cover of the case or box, and is held in an inclined circular piece, the cam turning in two or more of the balls at a time, so that when the door is being turned from an open or closed position for opening, the door is moved along by the cam turning on the pivot, the end of which turns in the inclined circular piece.

of 1903.—T. W. LOVATT and C. PURSER: *Working Wood-working Mechanism.*

Working mechanism, which comprises a frame or suspended arms adapted to carry any at its lower end a tool or tools which the frame or arm is moved upon its axis of rotation, may be utilised in cutting into the surface of a piece of wood resting in a stationary position below the tool or arm.

of 1903.—P. P. ORUM: *Fastenings for Windows, Doors, Boxes, and other Articles.*
 A lock for windows, doors, boxes, and the like, comprising a locking arm engaging a bolt and capable of turning around two perpendicular to each other, said arm being hinged to a pivot rotatively attached to the window leaves and having a plate having a U-shaped cavity that fits on its bottom, the bottom of the lock being adapted to engage said groove turned round at 180 deg.

of 1903.—A. ROBERTS: *A Construction of a Portable Folding Table, or the like.*
 A folding table, or the like, consisting of a cover of some soft material which can be clipped or folded up of cross pieces or the like capable of being folded up or taken down, and of legs which can be disconnected and folded up or taken to pieces so that the table can be packed in a small compass.

of 1903.—E. SUMMERFIELD: *A Wedge Adapted for Fixing Doors and Windows, and other similar purposes.*

Invention relates to a wedge fitting being adapted, when in use, for preventing opening of a door or window, and for fixing a door or window in a more or less open position. A short, narrow piece of metal is taken—say, for example, 4 in. in length by 1 in. in breadth, or of larger or of smaller relative dimensions—one end of same being cut to a fine edge, and the other end being turned down, the turned-down part being one-fourth of the entire length of the wedge, thus, when the fitting so formed is pushed so that it takes its bearings on the door and the turned-down end it will have the appearance and be of the form of a wedge.

These applications are in the stage in which they are entitled to the grant of Patents upon them can be seen.

24,043 of 1903.—A. J. SMITH and J. HUMPHREY: *Means for Securing the Doors of Lift Wells.*

This consists in the combination with a cam on the lift of means for moving the cam horizontally, latches projecting up through the floors to hold the doors of the well, and means operated by the cam to withdraw the latches.

25,335 of 1903.—E. CROWE: *Roller Bearing Drawers for Cabinets.*

A drawer fitted with extension slides and comprising a combination of anti-friction rollers and rails or channels, such rails or channels having closed ends, forming a closed roller path for the double purpose of preventing displacement of the rollers and forming a stop to the drawer.

11,258 of 1904.—E. STOFFER: *Fire-proof Quartz Bricks or Blocks.*

The manufacture of fire-proof quartz bricks by steaming, and subsequently burning the moulded bricks, consisting in the employment of magnesia as a binding material.

16,531 of 1904.—D. J. MCKENZIE: *Fire Arches for Furnaces.*

A fire arch for furnaces, consisting in the combination of a cross beam arranged transversely across the furnace, a plurality of inwardly-extending brackets secured thereto, and extending inwardly therefrom, a plurality of longitudinally-disposed bars detachably secured one to each of said inwardly-extending brackets, and fire-brick tiles detachably secured to each of such longitudinal beams.

16,808 of 1904.—R. NICHOLSON: *A Window Furniture Bracket.*

A combined roller blind and curtain pole support, comprising a lower projecting part for receiving the blind roller end or spindle, a fastening lug adjacent to said part, and the curtain pole carrying part, projecting up above the lower projecting part and beyond same, and having the carrying part at its extremity.

16,948 of 1904.—J. E. GAGNON: *Window Scaffolds.*

A device, comprising a seat, hook arms upon said seat adapted to engage the inner portion of a window sill to support the front of said seat, and means for supporting the rear of said seat, said means comprising a pair of adjustably-connected members adjustably secured upon said side of said seat and adapted to engage the rear portion of said window sill.

17,105 of 1904.—N. BARRETT: *Machine for Dovetailing Window Sashes.*

A sash dovetailing machine, consisting of a vertical adjustable circular saw revolving in a horizontal plane, in combination with a vertically adjustable table, coiled pressure springs, a vertical horizontal adjustable face carrying a metal protecting plate, a tapering liner, and a movable angle plate.

19,447 of 1903.—J. S. OWENS: *Apparatus for Mixing Concrete and the like.*

Apparatus for making concrete and the like, consisting in the application of a series of equi-distant bars or straps which pass down the middle of the shoot so as to form sinuous or zigzag-wise disposed surfaces, and are so fixed or attached as to be able to feather or vibrate, in combination with sloping baffles plates applied alternately to opposite sides of the shoot.

23,747 of 1903.—R. H. REEVES: *Sewer Manholes or Shafts.*

This relates to sewer manholes or shafts, and consists in constructing a shield or contracting appliance from segments and placing a ring on the top of such segments to keep them together, the whole being situated on corbels or projections in the manhole or shaft.

16,987 of 1904.—E. RYSER: *A Building Stone.*

A building stone, characterised by a main piece having the form of a four-sided prism, one face of which has a headpiece also having the form of a four-sided prism, and is so disposed that it projects with at least two lateral surfaces beyond the corresponding lateral surfaces of the main piece whilst it stands back one lateral surface in relation to the corresponding lateral surface of the main piece.

16,999 of 1904.—A. WOODHOUSE: *Gullies.*

A gully, consisting in the arrangement wherein the grating is held upon an internal shoulder in the frame, and is locked in position by a taper tongue upon the grating, which engages an undercut recess in the frame, and a gravity catch.

17,045 of 1904.—A. HENDEL: *Ventilating Apparatus.*

A ventilating apparatus or device characterised by this—namely, that the water serving for flushing the closet before entering

the flushing tank rises in one or more tubes, so that, by an atomising nozzle or nozzles, opening into a ventilating conduit, suction is produced, and, if two valve-fitted tubes be used, such suction may be produced in one or the other direction at will, while, at the same time, the atomised water passes from the lowest point of the ventilating conduit into the flushing tank.

17,066 of 1904.—G. B. GODSON: *A Composition for Effecting the Adherence of Tiles and the like to Walls.*

A composition for attaching opal glass tiles and the like to walls, consisting of about 40 per cent. of dextrine, 40 per cent. of powdered alum, and 20 per cent. of adamant cement, to which is added a sufficient quantity of gum dissolved in water, the composition being spread upon the back of opal glass tiles, and small pebbles, grit, fragments of coke breeze, or granite chips, being scattered upon its surface.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

September 23.—By HATCH, WATERMAN, & SON (at Tender).	
Tenterden, Kent.—"Ivy-ct." and 8 a. 2 r. 19 p. f.	£1,580
Woodchurch, Kent.—Moiety of pasture land, 40 a. 0 r. 11 p. f.	480
Stone, Kent.—Moiety of pasture land, 42 a. 3 r. 3 p. f.	325
By THOMAS & BETTRIDGE (at Tenbury). Tenbury, Worcestershire.—"The Berrington Estate," 553 a. 1 r. 10 p. f. (in lots)....	14,100
September 26.—By B. BAILEY & CO. Willesden.—132, High-rd. (s.), ut. 75½ yrs., g.r. 3½, cr. 60.	460
Neasden-lane, Cranford, Bucks.	450
By FRANCIS DOD & CO. Kingsland.—23, John Campbell-rd. (s.), ut. 63 yrs., g.r. 3½, y.r. 45½.	450
20, John Campbell-rd., ut. 63 yrs., g.r. 6½, y.r. 34½.	350
Stoke Newington.—3, 8, 13, 15, and 17, Sydney-rd., ut. 66 yrs., g.r. 2½, 10s., y.r. 170s.	1,760
Woodford.—23, 23, 25, and 27, Pelham-rd., l., y.r. 128s.	1,610
By KESELY'S. Snaresbrook.—Tavistock-rd., freehold building site.	460
Mitcham.—Spencer-rd., freehold building plot 300	300
Hare-st., "Regent Cottages," 4 p.	520
Hare-st., three blocks of freehold building land.	2,070
September 27.—By FREDERICK WARMAN. Islington.—113, Englefield-rd., ut. 38½ yrs., g.r. 7½, cr. 70s.	490
Hartingway.—21, Duckett-rd., ut. 85 yrs., g.r. 7½, cr. 40s.	390
By WESTON & SONS. Brixton.—23, Gateley-rd., ut. 67 yrs., g.r. 7½, cr. 45s.	410
81, Wiltshire-rd., ut. 60 yrs., g.r. 9½, cr. 60s.	460
By M. DE ROSE & SON (at Windermere). Hawkshead, Lancs.—Eshwaite Lodge Estate, 314 a. 1 r. 6 p. f.	8,250
The Home Farm, 145 a. 3 r. 24 p. f.	2,800
Waterside Farm, 37 a. 1 r. 28 p. f.	1,750
September 28.—By DANN & LEONAS. North Cray, Kent.—Cottage and fruit plantation, 3 a. 0 r. 4 p. f. p.	500
Fruit plantation, 2 a. 3 r. 0 p. f. p.	400
"Hammond's" fruit plantation, four cottages, and 1 a. 2 r. 14 p. f. p.	800
"Rum Skeet Hill" enclosure, 2 a. 3 r. 34 p. f. p.	350
Wilmington, Kent.—Two cottages, plantation, and 1 a. 2 r. 9 p. f. p.	290
Puddledock, five freehold cottages, p.	320
"Lumber Lands" Enclosures, 23 a. 0 r. 36 p. f. p.	1,700
"Ridley's Croft" Fruit Plantation, 5 a. 2 r. 34 p. f. p.	580
By PHILIP STOCK. Brixton.—45, Geneva-rd., ut. 62 yrs., g.r. 6½, cr. 38s.	305
By JOSEPH HODGKINSON (at Matlock Green). Snitterton, Derby.—"Lee Wood Farm," 152 a. 1 r. 9 p. f.	2,900
By T. BANNISTER & CO. (at Hayward's Heath). Staplefield, Sussex.—"Tyes-pl." and 164 a. 3 r. 9 p. f.	5,500
"Rose Cottage" and 2 a. 1 r. 4 p. f.	400
"Herring Pond" and "Dorcas Cottages" (four), also "Vine Cottages," l.	635
Enclosure of land, 8 a. 1 r. 37 p. f.	230
Tithe rent charges of 32l. 10s.	450
Tithe rent charges of 48l. 13s.	750
September 29.—By C. RAWLEY CROSS & CO. Acton.—Allison-rd., etc., two plots of building land, l.	313
By FISHER, STANHOPE, & DRAKE. Clapton.—41, Nightingale-rd., ut. 55 yrs., g.r. 11, cr. 46s.	350
By STANSON & SONS. Peckham.—44 and 99, Lugard-rd., ut. 71½ yrs., g.r. 9½, p.	610
Chisliana Cottages, l.g.r. 9½, reversion in 65½ yrs.	240
Herne Hill.—Hamilton-rd., l.g.r. 6½, reversion in 59½ yrs.	175
Tooting.—100, Upper Tooting-rd., ut. 77 yrs., g.r. 26½, p.	900
Upton Park.—218 and 220, Green-st. (s.), ut. 74 yrs., g.r. 12½, y.r. and g.r. 100s.	750
Plaistow.—13 to 21, Shattisbury-av., ut. 72 yrs., g.r. 45½, cr. 208s.	220

LEAD, &c. Per ton, in London. £ s. d. Sheet, English, 3lb. and up 14 12 6

ENGLISH SHEET GLASS IN CRATES. 32d. per ft. delivered. Irish 23d. " "

OILS, &c. £ s. d. Seed Oil in pipes per gallon 0 1 7

VARNISHES, &c. Per gallon. £ s. d. Oak Varnish 0 8 0

TO CORRESPONDENTS.

RESPONSE TO THE 'BUILDER.' (As stated in the notice on page 1.) Any statement which may pay no attention to anonymous communications.

TENDERS

Applications for insertion under this heading should be addressed to 'The Editor,' and must reach him not later than 10 a.m. on Thursdays.

BROADSTAIRS.—For supplying and laying 2,034 super. yds. of limestone-tar-paving, for the Broadstairs and St. Peter's Urban District Council.

CABRA (Co. Dublin).—For additions and alterations to the auxiliary buildings at Pellets Town, for the South Dublin Guardians.

CHATHAM.—For erecting a new Council school for 900 children at Clonecta-ross for the Chatham Education Committee.

CROSSNESS.—For new air-pumping engine, for the London County Council.

DEPTFORD.—For new penstocks, 6lb hoists, etc., at the Deptford pumping station, for the London County Council.

DEPTFORD.—For a 10-ton overhead traveller at the Deptford pumping station, for the London County Council.

DEVONPORT.—For levelling, paving, etc., streets and lanes. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, 29, Ker-street, Devonport.

DINNINGTON COLLIERY.—For building butcher's premises at branch for the Crumlington District Co-operative Society Ltd.

EDMONTON.—For the supply of broken granite, for the Urban District Council. Mr. G. Bedes Eachus, Engineer, Town Hall, Edmonton.

W. Griffiths & Co., Ltd., 35, Hamilton-house, Bishopsgate-street (Without), E.C.4.

EDMONTON.—For the supply of Portland cement, for the Urban District Council. Mr. G. Bedes Eachus, Engineer, Town Hall, Edmonton.

T. Moy & Co., Ltd., G.E.R. Palace Gates Station, Wood Lane, N.W.

EDMONTON.—For the supply of stoneware pipes, for the Urban District Council. Mr. G. Bedes Eachus, Engineer, Town Hall, Edmonton.

EDMONTON.—For erecting a chapel at Edmonton Workhouse, Upper Edmonton, N., for the Guardians. Mr. T. E. Knightley, architect, 108, Cannon-street, E.C.4.

EGREMONT (Cumberland).—For alterations and additions to butcher's shop at central stores, for the Industrial Co-operative Society, Ltd.

EPSOM.—For the superstructure of the Long Grove Asylum, for the Asylum Committee of the London County Council.

FRASERBURGH (N.B.).—For erecting a free library, corner of King Edward-street and the Hexagon, for the Town Council.

FRIERN BARNET.—For the erection of public offices in the Friern Barnet-road, N., for the Friern Barnet Urban District Council.

GRANGE-OVER-SANDS.—For road works, Rock-land-road, for the Urban District Council.

HALIFAX.—For converting four houses at King's Cross into a draper's shop and houses. Messrs. Jackson & Fox, architects, 7, Rawson-street, Halifax.

HAMILTON.—For erecting workmen's dwellings at Lowwaters, for the Hamilton Town Council.

HASLEMERE.—For shop and dwelling-houses, Haslemere, for Mr. J. Humphrey.

HINDLEY (Lanes.).—For private street works (two contracts), for the Urban District Council.

LINCOLN.—For restoring the Grey Friars Building, for the Lincoln Corporation.

TENDERS.—Continued on page 379.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Design to be Delivered.
*External Treatment of Building for Tropical Climate	Messrs. Sanders & Harding	50l.	Dec.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered.
380 Canary Pine Boards	Manchester Tramway Committee	J. M. McElroy, Tramway Department, 55, Piccadilly, Manchester	Oct. 10
2,000 Tons Hastingden Grit Setts	Manchester Corporation	Chief Clerk, Highways Department, Town Hall, Manchester	do
Greenhouses, etc., Coronation Park	Radcliffe U.D.C.	Engineer, Council Offices, Radcliffe	do
400 Tons of Quartzite or Granite	Sevenoaks U.D.C.	S. Towson, Surveyor, Argle-road, Sevenoaks	Oct. 10
Condensers and Pipes	Rochdale Corporation	Lacey, Sellar, & Leigh, Engineers, 2, Queen Anne's-Gate, S.W.	do
Junior & Infants' Schools, Byrom-st., Barkerend-rd.	Bradford Education Committee	Architect's Department, Education Office, Manor-row, Bradford	do
Private Street Works, Craig-street	Pontypridd U.D.C.	P. R. A. Wilkingsby, Engr. and Surv., Council Offices, Pontypridd	do
Theatre, Aberdeen	Paving, etc., Committee	Paving, etc., Department, Town Hall, Manchester	do
500 Tons of Granite	Robert Arthur Theatres Co.	Brown & Watt, 17, Union-terrace, Aberdeen	do
500 Tons of Hand-Broken Slag	Camberwell Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Camberwell	do
Sewering Hamilton-road (labour only)	Mexborough U.D.C.	G. F. Carter, Surveyor to Council, Mexborough, near Rotherham	do
Sewage Works at Radcliffe	Whitefield U.D.C.	T. Thorn, Knowsley-road, Whitefield	do
Hall and Schoolroom, Cwmpare, Rhondda Valley	Alnwick R.D.C.	H. W. Walton, Clerk, Alnwick	do
Additions to Tramway Offices, etc., Ley-street, Ilford	Ilford U.D.C.	H. Shaw, surveyor, Town Hall, Ilford	do
Fireclay Retorts, etc.	Rochester, etc., Gaslight Co.	J. M. Vevers, Engineer, Gas Offices, Rochester	do
Underdraining Recreation Ground	Ripley (Derby) U.D.C.	C. W. Thompson, Surveyor to Council	do
Brick Shelter	do	do	do
Painting, etc., Interior of Corn Exchange	Luton Town Council	Borough Surveyor, Town Hall, Luton	do
Two Caretakers' Rooms, Isolation Hospital	Falmouth, etc., Port San. Authority	Borough Surveyor, Falmouth	do
Boiler, Ipswich	Electric Supply and Tramway Com.	F. Ayton, Engineer, Constantine-road, Ipswich	do
Alterations at Workhouse, West Malling	Guardians Joint Isolation Hospital	Master at the Workhouse	Oct. 10
Alter., etc., to Drill Hall, St. Mary's-road, S'hampton	1st Hamps. Road & Garr. Uniters	Lemon & Bilz, Architects, Castle-st., S'hampton	do
Street Works, Hamilton-road, Coldthorpe	Bolton-upon-Deane U.D.C.	Surveyor, Council Offices, Bolton-upon-Deane, Rotherham	do
Wesleyan Chapel and School, Princeville, Bradford	L.C.C.	A. Sharp, Arch., Pearl Assurance-buildings, Market-st., Bradford	do
Electric Lighting of Ranger's House, Blackheath	Tynemouth Joint Isolation Hospital	M. Fitzmaurice, Engineer, County Hall, Spring Gardens, S.W.	do
Road Works, Sandringham Gardens, etc., N. Shields	Birmingham Elec. Sup. Committee	E. L. Gault, A.R.I.B.A., 5, Charles-street, Bradford	do
Building Work, Electric Generating Sta., Summer-la.	Birmingham Elec. Sup. Committee	H. Harper & Bro., Archs., Ruskin-chambers, Corporation-st., B'ham	do
Alterations, Danygraig House, Treharris	Conservative Club and Institute	W. Dowdeswell, Architect, Treharris	do
Road Metal	Southern Mahratta Railway Co.	E. Z. Thornton, 46, Queen Anne's-gate, Westminster, S.W.	do
Road Roller, etc.	Bedlintonshire U.D.C.	J. E. Johnson, Surveyor, Bedlington	do
Road Works, Harlow-street, Bridlington	Executors of the late R. Harrison	S. Dyer, Architect, 29, Quay-road, Bridlington	do
Painting Eight Homes at Styal, near Handsworth	Committee of Styal Cottage Homes	D. S. Bloomfield, Union Offices, All Saint's, Manchester	do
Foundations, etc., Smallpox Hospital	Kirkburton Joint Isolation Hospital	J. Barry, Architect, 3, Market-place, Huddersfield	do
400 Tons of Road Metallizing	Burry Port U.D.C.	H. B. Jones, Surveyor, Council Offices, Burry Port	do
Making-up Carshalton Park-road	Carshalton U.D.C.	Council Offices, High-street, Carshalton	do
Streets and Sewers, near Roth Park, Cardiff	Marquess of Bute	B. W. M. Corbett, Bute Estate Office, Castle-street, Cardiff	Oct. 10
Factory, Burnett-street, Bradford	Mr. J. Scott	E. Ledingham, F.R.I.B.A., 5, Charles-street, Bradford	do
Out-patients' Department, Bradford Children's Hos.	Manchester Corporation	City Surveyor, Town Hall, Manchester	do
Brick & Concrete Covering over Mellock at Ardwick	Ocellgaer, etc., R.D.C.	W. Bevan, Highway Surveyor, Den, via Cardiff	do
Broken Limestone	Carriek-on-Shannon Waterworks, Com.	J. Harper, Sakes, Arch., Calverley-chambers, Victoria-sq., Leeds	do
Pumping 40,000 Gallons of Water Daily	Llantrisant, etc., R.D.C.	P. Rhyll, Surveyor, Council Offices, Burry Port	do
Road Improvement, Llantrisant	do	G. S. Morgan, School-street, Pontypool	do
Laying 250 yds. Stoneware Sewer at Penthrifwr.	Director-General Ordnance Survey	Office in Charge of Stores, Ordnance Survey Office, Southampton	do
Copper Plates for Photo Etching	Chelmsford Corporation	Town Clerk, 10, Long-st., Chelmsford	do
Corrugated Iron Engine Shed, Mildmay-road.	Athlone U.D.C.	P. J. Prendergast, A.M.I.C.E., Athlone	do
Oil Engine at Waterworks	Hollingbourn R.D.C.	J. S. Roper, Surveyor, Hollingbourn	Oct. 10
Team Labour	Nantyglo and Blaifa U.D.C.	W. J. Davies, Surveyor, Blaifa	do
400 Tons of Limestone	Brighton Corporation	H. Talbot, Town Clerk, Town Hall, Brighton	do
Electric Light, Telephones, etc., Diphtheria Pavilion	Repton R.D.C.	J. T. H. Richardson, Engineer, Hatton, near Tutbury	do
5 Dwlg.-houses, New-st., Alfarzate Bldg. Est., D'ham	Glasgow Corporation	Office of Public Works, 84, Cochrane-street, Glasgow	do
Sewage Tank, etc., Heston near Tutbury	Aston Manor Town Council	R. Foster, Electricity Works, Chester-street, Aston Manor	Oct. 10
Public Conveniences, Phoenix Recreation Ground	do	do	do
Engine Room Stores	Sheffield Education Committee	Education Offices, Sheffield	do
Electrical and General Stores	Admiralty	Directors of Works Department, 21, Northumberland-ave., W.C.	do
Ironmongery	Methley U.D.C.	O. B. Hartley, Engineer, 10, East-parade, Leeds	Oct. 10
*New Coastguard Buildings, Osmington, nr. Weymouth	Dunbar Town Council	Town Clerk, Dunbar	do
Gas Engines and Pumps (Sewage Works, Contract 3)	Whitley, etc., U.D.C.	J. P. Spencer, Architect and Surveyor, 30, Howard-st., N. Shields	do
A 4-in. Water Main (600 yds.)	Plymouth Corporation	J. Paton, Borough Engineer, Municipal Offices, Plymouth	do
Road over the Links, Whitley Bay	Trus. of Ballahassie Drainage Dist.	P. Hayes, 59, South Mall, Cork	do
Goods and Materials	Faversham Corporation	A. Russell, 29, West-street, Faversham Junction, Portsmouth	do
Cleansing River Owenbury, etc.	Glasgow Corporation	J. R. Rhind, Architect, 67, Hope-street, Glasgow	Oct. 10
Road Metal	do	do	do
Heating and Ventilating Dennistown Library	Sir T. Wrightson, Bart.	G. G. Hoskins, F.R.I.B.A., Court-chambers, Darlington	do
Heating and Ventilating Bridgeton Library	G.W. Railway Co.	O. D. Oliver, Chief Architect, Court-chambers, Darlington	do
New Wing, Neasham Hall, Darlington	Stockport Guardians	Office of Stores Superintendent, Swindon	do
Painting Works at Police Stations.	Rotherham Gas Committee	W. H. Ward, Architect, Paradise-street, Birmingham	do
Stores	Huddersfield Guardians	F. A. Winstanley, Engineer and Manager	do
Cooking Apparatus, etc., Stepping Hill Infirmary	Portsmouth Education Committee	A. H. Bone, Architect, Cambridge Junction, Huddersfield	do
Reports and Electricals	Wigan Guardians	R. Walker and Son, 17, South Mall, Cork	do
Painting, etc., Deauhouse Workhouse Premises	Heaton U.D.C.	J. E. Alcock, Union Workhouse, Frog-lane, Wigan	do
Cookery Centre, Francis-avenue School	Birmingham Education Committee	E. A. Rigby, Union Offices, Ramsden-street, Huddersfield	do
Reconstruction of Roof of Cork Library Buildings.	Tottenham U.D.C.	A. Rowse, 3, Newhall-street, Birmingham	do
*Sewer Works in Outlets Eccles-lane	Barrow-in-Furness Corporation	Council's Engineer, 712, High-road, Tottenham	Oct. 10
*Making-up Roads	East Barnet U.D.C.	H. R. Burnett, Electricity Works, Barrow-in-Furness	do
Arc Lamps, etc. (Contract 15)	Boote Corporation	Borough Engineer's Office, Station-road, New Barnet	do
Private Improvement Works	South Indian Railway Co.	H. W. Notman, 55, Oracechurch-street, London, E.C.	do
425 Tons of Iron Wire Fencing	Office of Public Works	Office of Works, Dublin	do
Alterations, etc., Londonderry Post Office	East Barnet U.D.C.	Engineer to Council, Council's Offices, Heaton, N.W.	do
Electric Lighting of Council House	Weardale Steel, etc., Co.	Thorley Colliery, Thornley, R.S.O.	do
Sinking a Shaft, 250 yds., at Thornley Colliery	Borough of Hampstead	W. H. Dashwood Caple, Architect, Church-st., Tottenham	Oct. 10
Alterations, etc., National Schools, Pontnewydd	Borough of Fulham	Borough Engineer, Town Hall, Hampstead, N.W.	do
*Erection of Buildings at Lower Cross-road	Building Committee	Borough Surveyor, Town Hall, Fulham, S.W.	do
*Roadmkg. Wks. Huddersfield, Hurlingham-rd., etc.	do	J. M. Graves, Townsend House, Thurlstone, Penistone	Oct. 10
Heating Thurlstone Church	do	do	do

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Works, etc., supplied by, and Timers to be delivered. Lists various construction contracts and their details.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Lists public appointments and their terms.

Those marked with an asterisk (*) are advertised in this Number. Competitions, iv. Contracts, iv. vi. viii. x. Public Appointments, xvii.

TENDERS.—Continued from page 377.

Table of tenders for restoration, alteration, and maintenance of the Market Hall and Assembly Rooms, Urban District Council.

Table of tenders for South-West Bethnal Green, Daniel-street, and North-East Bethnal Green, Globe-terrace.

Table of tenders for East St. Pancras, "Brecknock" School (Redividing Rooms C, D, and E in the Bay's Department into Four Rooms by Moving certain Partitions, and Providing a New Partition, etc.).

EDUCATION COMMITTEE TENDERS.

Table of tenders for partitions, etc., in Chelsea, Kilburn Lane, and E. Islington, "Forster".

FOR ERECTING PLAYSHEDS AT VARIOUS SCHOOLS.

Table showing tenders for erecting playsheds at various schools, including Millbank, Rolls-road, Canterbury-road, and Ponton-road.

LONDON.—For the docking and repair of the a.s. *Barron*, for the London County Council:—
 Thames Ironworks Shipbuilding & Engineering Co., Ltd. £1,771 11 0
 W. C. Reader & Co. 1,434 2 5
 Mills & Knight 1,493 18 6
 London Graving Dock Co., Ltd. 1,463 0 0
 Brown's Dry Dock & Engineering Co., Ltd. 1,399 0 0
 Fletcher, Son, & Farnall, Ltd., Millwall* 1,300 0 0

MANSFIELD.—For erecting mixed and infants' schools, Newgate-lane, for 700 children, for the Education Committee. Messrs. Vallance & Westwick, architects, Mansfield:—
 T. Cutbbert, Hyson Green, Nottingham* .. £7,550

MOSS SIDE (Lanes).—For erecting public baths, Middleton-street, for the Moss Side Urban District Council. Mr. H. B. Longley, Engineer and Surveyor, Council Offices, Moss Side. Quantities by Mr. J. B. Langley, Manchester:—
 G. Macfarlane & Son, Manchester* £10,725
 [The lowest of ten tenders received.]

NORTHAMPTON.—For new school and cookery centre, Kingsthorpe-grove, and formation of road, for the Education Committee. Messrs. Law and Harris, architects and surveyors, Northampton. Quantities by the architects:—
 E. Archer £16,174
 E. D. Sharman & Son 16,150
 W. Beardsmore 16,081
 R. Casford 15,850
 W. Heap 15,773
 G. W. Souster 15,724
 G. F. Sharman 15,670
 H. Green £15,612
 E. Green 15,382
 G. J. Fisher 15,330
 W. Higgins 15,262
 A. P. Hawtin 15,259
 A. A. Clarke 15,225
 A. J. Chown 14,815
 † Withdrawn.

PONTARDAWE (Wales).—For constructing a stone bridge, approaches, etc., over the Nantmilw, for the Rural District Council:—
 P. Rogers, Glais Clydach £174 10

PORTISHEAD (Bristol).—For road works at Portishead, for the Urban District Council. Mr. Frederick H. Smith, surveyor, Fairmount, Portishead. Quantities by surveyor:—

Woodhill-road.	
M. Lovell .. £2,490 16 7	Lloyd & Son £1,757 0 7
J. Marshall .. 2,194 0 0	T. Free & Co. £1,776 5 1
W. A. Green .. 2,112 10 1	J. & T. Binns, Knowle, Bristol, & Croydon* .. 1,638 15 2
W. & J. Bennett .. 2,018 0 0	J. Coles & Son .. 1,567 2 11
R. W. Hunter & Co. 1,989 17 2	
Bench-road.	
M. Lovell .. £1,594 18 11	T. Free & Co. £1,289 11 4
J. Marshall .. 1,477 0 0	Lloyd & Son .. 1,225 5 6
W. A. Green .. 1,468 10 0	J. Coles & Son .. 1,140 2 7
R. W. Hunter & Co. 1,466 3 2	J. & T. Binns, Knowle, Bristol, & Croydon* .. 1,142 15 3
W. & J. Bennett .. 1,430 0 0	

STEVENAGE.—For tar-paving and resetting kerb and channel of Albert-street and part of High-street, for the Urban District Council. Mr. John Gillespie, Council's Surveyor, Stevenage:—
 S. Deley & Co. £371 12 6
 P. Smith 352 9 2
 La Brea Asphalte Co., Ltd. 330 10 0
 Asphaltes United 290 5 0
 Public Works Co. 230 5 0

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SWANLEY (Kent).—For erecting iron fencing at the White Oak School, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-chief:—
 F. Fox £380 15 0
 W. Lucy & Co., Ltd. 259 10 0
 Lockerbie & Wilkinson, Ltd. 297 2 0
 Hefford & Shuttlewood, Ltd. 197 10 0
 W. Hayward & Sons, Ltd. 195 0 0
 Messers Bros., Ltd. 193 10 0
 Salway Bros. 182 14 6
 G. B. Smith & Co. £185 15 0
 S. W. Gibson 163 7 6
 E. J. Raybould & Co., Ltd. 151 0 0
 Bayliss Jones & Bayliss, Ltd. 149 15 0
 M. McVeay 147 15 9
 J. Priest & Son, Hill & Smith, Brerley Hill Ironworks, Staffs.* 130 0 0

TOOTING.—For constructing an overground convenience at Cemetery, Blackshaw-road, Tooting, S.W., for the Lambeth Borough Council. Mr. H. Edwards, Borough Engineer, 348, Kennington-road, S.E.:—
 T. Laphorne & Co. £346 0 0
 J. N. Leonard 298 15 0
 G. Cruss & Co. 277 0 0
 J. Shelbourne & Co., 70, Fen-church-st., E.C.* 276 0 0

TROWBRIDGE.—For additions and alterations to schools, for the Managers of the Newtown British Schools. Messrs. T. B. Silcock & S. S. Reay, architects, 47, Milson-street, Bath:—
 H. A. Forse & Sons £2,235
 A. J. Colborne £1,738
 Erwood & Morris 1,694
 W. Webb 1,695
 J. Long & Sons, A. Wills & Co. 1,798
 Bath* 1,593

WARLEY.—For constructing detritus and screening chambers, storage tanks and pump well, and erecting pumping station, office and store, for the Oldbury Urban District Council. Mr. J. T. Eays, engineer, 39, Corporation-street, Birmingham:—
 J. Wortley, Oldbury* £1,431 7 11

WARRINGTON.—For widening Warrington Bridge, for the Corporation. Mr. J. J. Webster, engineer, 39, Victoria-street, Westminster, S.W.:—
 H. Fairclough, Warrington* £3,263

WIMBLEDON.—For making-up roads, for the Urban District Council. Mr. C. H. Cooper, Engineer and Surveyor, Council Offices, Wimbledon:—
 Asebury-road.
 E. Hes, jun., Wimbledon* £865 0 0
 Strathearn-road.
 E. Hes, jun., Wimbledon* 480 0 0
 Worplesden-avenue.
 T. Adams, Wood Green, N.* 424 0 0

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GLASGOW: 47 and 49, ST. ENOCH-SQUARE.
BRISTOL: ASHTON GATE WORKS, COPONATION

ILLUSTRATIONS.

Interior, San Lorenzo, Verona.....	From a Photograph.
New Hôtel de Ville, Sens.....	MM. Dupont and Poivert, Architects.
1. Exterior Elevation.	
2. Details of Ceilings.	
The White House, Helensburg	Mr. M. H. Baillie Scott, Architect.
1. Garden Front.	
2. Interior of Hall.	


Illustrations in Text.

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San Lorenzo, Verona.

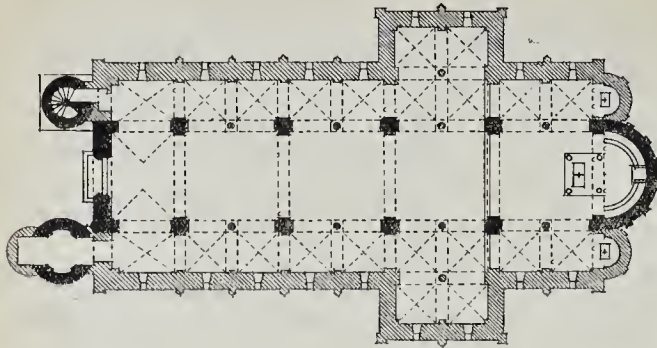


N the north side of the Corso Cavour at Verona, between the street and the Adige, and facing the piazza of the ancient church SS. Apostoli, a glimpse may be had of a little known and remarkable church, seldom visited—S. Lorenzo. Baedeker misses it in a line; Hare fails to notice it at all; nor is it mentioned in De Castelein's monumental book on Lombardic architecture. Verona is full of ancient arches—from S. Stefano, parts of which date back to the IXth century, to the choir of S. Zeno, the Durham peyper of Italy, built probably in the eleventh century. Milan, Pavia, and Verona are the incunabula of Italian Romanesque. Among these Lombardic churches, S. Lorenzo presents many points of interest in plan, elevation, and detail: It consists of an aisled nave, with piers, or, rather, quasi-transpts, for a pier arcade runs uninterruptedly across the transepts as it did in Ernulph's choir at Canterbury, a choir with three parallel eastern apses, and an eastern aisle to each transept. The façade has four round towers, as at Aix-la-Chapelle, and there is a square tower south of the choir. The pier-arcade consists of four and a half coupled bays—one in the choir, one in the transept, two and a half in the nave. As at Durham, the westernmost bay is a half bay: The aisles are groined,

and, as at Jumièges, are surmounted by a groined gallery, which returns round the transept ends, as in St. George's de Boscherville and Winchester Cathedral. This gallery was also originally carried round the west end of the nave, for the base of the midway column has been found; the western gallery has now been rebuilt, as shown in the photograph. The approximate dimensions of the church are:—Length, 110 ft.; transept, 72 ft.; breadth of nave, 21 ft., and of nave and aisles, 38 ft.; height, 42 ft.

The whole of the interior was masked by a veneer of Renaissance work; this was swept away at the restoration of 1889, and it has been attempted to restore the interior to the form which it presented at the period when it was built. But what that period was has yet to be determined. The authorities of the church, as is natural, carry back the date to very early days—even to the very beginnings of State Christianity, when Constantine, c. 330 A.D., is said to have handed over to the Christians of Verona a temple of Venus, on the site of the present church: Again, a church of S. Lorenzo is mentioned in the time of King Pepin (800-808), a son of Charlemagne, whose subterranean tomb and sarcophagus are still to be seen in the churchyard of the neighbouring church of S. Zeno; so that the present church may belong to the earliest years of the IXth century. If so, it will be older than anything at Pavia; older even than the apses of S. Ambrogio and S. Eustorgio at Milan: Again, in 1185, Pope Lucius III. granted to it certain privileges as

to mass: As far as documentary evidence goes, therefore, the church may be of the IVth century, IXth century, or XIIth century. Nor is this all. The internal elevation of the choir differs from that of the nave—the latter is shown in the photograph from the south-east. In the choir the pier-arches are wider and semicircular, not stilted; and the gallery is very small and set very high, leaving a large space of blank wall between the pier-arcade and the gallery. Again, the south wall of the nave, half way up, is of alternate courses of stone, brick, and river-pebbles, some of the latter being set in herringbone fashion: The upper part of the wall is built of much larger stones or of brick, and is of much better masonry: It follows that the choir and apses may be earlier than the western part of the church and that the upper part of the nave may be later than the lower part, the galleries being a later addition, as they probably are in the basilicas of S. Lorenzo and S. Agnese, Rome. It is just possible that these earlier parts may be of the IXth century; the rest must be much later. Now turn to the plan. The triple eastern apse is found at Rome, at S. Pietro In Vinculis (VIIIth century), and S. Maria In Cosmedin and S. Maria In Domnica (IXth century), and in S. Ambrogio, Milan (824-859). Again, the return aisles of the transepts and the west end are decidedly a mark of late date; they occur in the middle of the XIth century in the Caen churches, but are very exceptional in the north of Italy. Outside are the foundations of an exo-narthex, which may have formed



Plan of San Lorenzo, Verona. (From Hubsch's "Architecture Chrétienne.")

part of an atrium. At S. Ambrogio, Milan, an atrium was added in the XIIIth century. The pair of western towers, also, are found in S. Ambrogio; in the Verona church they are in a line with the aisles; in S. Ambrogio they are flanking towers.

As for the materials, the interior is built partly in brick, partly in alternate courses of brick and stone—a common fashion in Verona. As in S. Ambrogio, Milan, and S. Michele, Pavia, the aisles are in two stories, both covered with groined vaults, and, as in S. Ambrogio, there is no clearstory. The piers, too, are arranged in Lombard fashion. Was it with a view to covering the nave in great squares with an intersecting ribbed vault? That seems hardly probable; the slenderness of the supports seems against the possibility of a Lombard vault, which was usually very heavy, sometimes as much as 20 in. thick. Rather one would judge that the heavy vaulting shaft of each principal pier was intended to carry a broad transverse arch crossing the nave, with its spandrels filled up with walling carrying the purlins. Thus the wooden roof would be divided by four party-walls into five compartments, and a fire in any one compartment could not spread into the neighbouring compartment. A similar roof occurs in S. Miniato, Florence (XIIIth century), and in Modena Cathedral, and formerly in St. George's de Boscherville, Normandy, and in the aisles of St. Peter, Northampton.

As for the plan with alternating piers and coupled bays, this in itself forbids a IXth century date. This Lombard plan of church occurs indeed in S. Eustorgio, Milan, and in SS. Felix and Fortunatus, outside the walls of Vicenza, both Xth century churches; but in both the piers are less advanced in type than at S. Lorenzo. The columns are a curious melange of different marbles; some are monoliths, others are pieced together; capitals and bases, too, are a miscellaneous assortment, reminding one of the diversity of S. Maria in ara celi, Rome, which may be c. 900. But an equally mixed set of capitals, shafts, and bases may be seen in the XIIth century crypt of S. Zeno, Verona. In both the Verona examples some of these capitals, bases, and shafts come, no doubt, from earlier churches on the same site. Others are of different origin, for some of the capitals are too small, others too large for their shafts. Some

of the columns have the Attic base, some have none, some have large bases hacked down to fit. It will be noticed that, owing to the thickness of the wall and the slenderness of the columns and their capitals, both in the pier-arcade and in the upper aisle, the Byzantine dossier or cymaise occurs instead of an abacus; this is common in Lombardic work. The principal piers have a cushion capital similar to those of S. Zeno, Verona, but less developed. Cushion capitals occur in S. Miniato, Florence, and S. Abbondio, Como, in the XIth century. All the capitals of S. Theodore, Pavia (1190), are of the cushion form. The pier-arches are more simple in type than those of S. Ambrogio, Milan, and S. Michele, Pavia, not being recessed in orders. On the other hand, the gallery-arches of the choir are in two orders, and the windows have square orders. Of the string beneath the gallery, many fragments were found at the restoration, one or two *in situ*. It is very classical in character, and seems too elaborate to have been executed before the XIIIth century. Externally, there are brick buttresses—pointed oblongs on plan—which occur in other XIIIth century churches—at Verona and Milan; where, also, a similar semicircular corbel-table is common, appearing first perhaps in the IXth century, in the choir of S. Ambrogio. The two western towers are very remarkable; both are circular, both contain newel staircases leading to the spacious galleries, which, as in the Byzantine churches, may have been appropriated to the female members of the congregation. Still more remarkable are the bases of the towers. One tower stands on a big quadrangular sculptured block, which may quite conceivably have been an altar belonging to the Temple of Venus, which the IVth century church superseded. The other stands on the base of some vast column, such a base as one sees still here and there, for the engaged columns of piers in the halls of the Roman thermae.

And now to sum up. The church presents many features to be found in the very earliest Romanesque churches, and even in the early Christian basilicas of Rome and Ravenna, and the domical churches of the Eastern Roman Empire. On the other hand, there is not a single one of these features which cannot be paralleled in undoubted Romanesque work of the XIth or XIIth century.

Further, there are other features which occur nowhere before the XIth or XIIth century. The conclusion seems incontestable—that we must dismiss as a figment any ascription of the church to the IVth century and come to the conclusion that, if any part of the church belongs to the IXth century, it can only be the eastern apse, the lower part of the walls and fragments of east-work re-used. The church, as it appears now, cannot be earlier than the latter years of the XIth or the early years of the XIIth century. Some help to date may be got from the great church of S. Zeno. It resembles S. Zeno in many respects, but in a humbler and less ambitious fashion. Now, S. Zeno was built not earlier than 1138, which would give us for S. Lorenzo a date earlier than the first quarter of the XIIth century. Its position relative to S. Ambrogio, Milan, and S. Michele, Pavia, is still more uncertain; the date assigned to these churches by De Darstein is quite impossible, and has any other date been satisfactorily established. A probable sequence is: (1) S. Ambrogio, Milan, except the apse and choir, which are IXth century; (2) S. Michele, Pavia; (3) S. Lorenzo, Verona; (4) S. Pietro in ciel d'oro, Pavia, consecrated in 1136; (5) S. Zeno, Verona after 1138.

THE REPORT ON WORKMEN'S COMPENSATION.

IN our former issues we have referred to the general observations of the Report of the Departmental Committee on Workmen's Compensation, and we purpose now to make one or two observations on the recommendations contained in the Report, although we do so in no cavilling spirit, since the Report has been framed only with great attention to detail, and the suggested amendments have been conceived in an impartial spirit, with reference to the various interests represented before the Committee.

In making these observations we propose not to follow the text of the Report, but to take the Act and, as far as possible, follow the order of its provisions.

As regards the word "accident," the Committee recommend that no attention should be made to define it, but that the Courts must be left to determine whether an injury is or is not accidental. The Committee do, however, say that they are not prepared to advise an extension of the Act to include diseases incidental to a man's occupation. Although we agree with this view of the Committee, their recommendation appears hardly strong enough to attain the end in favour. As the law now stands the anti-cases, *Turvey v. Brinton*, and *Higgin v. Campbell and Harrison*, are binding precedents, and they are compelled to decide diseases incidental to occupation as accidents within the Act. These cases are an appeal to the House of Lords, and if they are reversed there will be no difficulty in giving effect to the recommendation of the Committee; but should the House of Lords affirm these decisions, it is obvious that a change in the law will be necessary to carry out the vi-

expressed in the Report, and a definition would have to be given of the word "accident."

The Committee recommends (paragraph 111) that the limitation of locality involved in the words "on, in, or about," should be modified, and that the workman shall be entitled to the benefits of the Act, wherever the accident happens, whilst he is actually engaged on the duties of his employment; but this recommendation must be read with the important limitation contained in paragraph 153, that it is not to apply when an "undertaker" is liable to the workman if his sub-contractor, in which case the liability is still to be limited to an accident which happens, on, in, or about the undertaker's own works, or the place where he is exercising control in carrying out the work. As to the word "undertaker," which, when read in conjunction with the word "employer," as used in the Act, has caused some difficulty, specially with reference to indemnities under section 4, the recommendations of the Committee are not so clearly expressed, and it will be for Parliament to consider the form to be given to their recommendation. The intention is clear that wherever an employer has had to pay compensation to a sub-contractor's workman, there is to be an indemnity. It appears that the word "undertaker" might well be dispensed with throughout the Act in favour of the word "employer," although this would necessitate re-drafting the defining section, where undertakers are referred to with reference to the various employments within the Act.

Some of the definitions suggested in the Report would require careful consideration. Thus it is proposed to define "wharf" as "a place for landing or unloading goods or passengers contiguous to water." This definition seems to have been suggested to adopt the view expressed by the majority of the Court of Appeal in *Haddock v. Humphrey*, but would it include the decision in *Ellis v. William Cory and Co.*? The intention of the Committee appears to be to express the law as laid down in both these cases, but would discharging goods upon a floating structure in mid-water unconnected with the shore be deemed to be "landing" them? Moreover, the definition appears too wide, since it would include piers and wharves, and a pleasure steamer taking up passengers from a pier would be using a wharf. As regards warehouses the Committee propose sweeping away the distinction between wholesale and retail premises now laid down in the Courts in *Green v. Britten and Gilson*, limiting the employment to "storage for sale or safe custody by way of trade, or for purposes of gain."

A definition of "engineering work" is also suggested, extending the operations to road-making, well-sinking, construction and maintenance of telegraphs, telephones, "and other electric appliances," but the latter words appear far too vague, and would encourage much litigation.

The Committee have recommended an extension of the Act to quarries less than 20 ft. deep, but in this connexion a matter which causes much hardship

in the case of mines and quarries seems not to have been brought to the attention of the Committee. The definition of undertakers in the case of such undertakings includes the "occupier," but, owing to a lack of definition of the word "occupier," the persons temporarily working quarries may escape liability, and the occupiers also may become liable to pay sub-contractor's workmen, and yet have no right of indemnity from the sub-contractor. We should suggest a simple remedy for this by defining the word "occupier" in this connexion as it is defined in the case of docks, wharves, quays, etc., including persons having the actual use and occupation of such premises. As regards building operations, the Committee have recommended the drastic course of abolishing all restrictions, and including all building operations. The restrictions in the present Act were inserted to exclude small builders, and the Committee, in relation to other occupations, seem fully alive to the objections of including small traders, unless and until a system of compulsory insurance can be enforced, and consequently we are drawn to the conclusion that, in the case of building operations, their only reason for including all building operations was the difficulty of suggesting satisfactory limitations, and the litigation that has attended those contained in the present Act. We venture to suggest that a limit, based on the cost of the work to be done, may possibly offer a satisfactory solution of this question, since a low limit on contract prices would exclude the use of real scaffolding or machinery. The suggestion that the word "dependants" should include brothers and sisters is a departure from the Fatal Accidents Act which does not meet with our approval, and which the Committee fails to support with any strong reasons. The burden placed on industries should, in our opinion, not be so increased.

The recommendations of the Committee as to the assessment of compensation in the case of labour casually employed do not seem to offer any satisfactory solution of a question which hears heavily on both employer and workman. The recommendation practically comes to this—that the standard prescribed by the Employers' Liability Act, 1880, may be applied, and the earnings he estimated by reference to the earnings of persons in the same grade of employment in the district—the principle adopted by the County Court Judge in *Bartlett v. Tutton and Sons*. This recommendation involves the proposition that the employer of a casual hand, he the employment only for an hour or two, must incur the liability of having to pay him compensation out of all proportion to his service, and practically on the same scale as the workman regularly employed, who is probably a higher class workman. Under the Employers' Liability Act the principle is reasonable, since negligence on the part of the employer or his servants is involved in the injury to the workman; but when accidents are unconnected with negligence, as under the Workmen's Compensation Act, this principle is inequitable. The question is an extremely difficult one, but we hoped that the

Committee might have devised a more satisfactory solution, and a different scale have been applied in the case of really casual hands, a principle adopted by the Committee in reference to the aged and infirm. The recommendations of the Committee dealing with the election of remedies, taken in conjunction with the proposed limit to be placed on the redemption of weekly payments, will tend to do away with some cases of hardship. In the *Law Times*, March 7, 1903, an example was given of a case of considerable injustice to employers. In this case a man claimed under the Employers' Liability Act 250*l.*, and, having failed in his action, obtained an award under section 2 sub-section 4, and the employers who were compelled to defend themselves against the charges of negligence, and who had succeeded in their action, found themselves saddled with a liability to pay some 750*l.*, in place of the 250*l.* claimed in the action. We do not, however, agree with the suggestion made by the Committee that in actions at common law or under the Employers' Liability Act, a plea may be set up that the workman has an adequate remedy under the Workmen's Compensation Act; such a plea would raise questions of great difficulty and considerable uncertainty.

Before leaving the subject of compensation, we desire to draw attention to a point which seems not to have been brought prominently before the Committee. At a recent meeting of the Oddfellows, complaint was made of the pernicious influence the Workmen's Compensation Act was having upon the funds of benefit societies. These societies hesitate to pronounce a man fit for work as long as he is in receipt of compensation, yet since compensation is received without any of the restrictions attending sick pay, the men are not so anxious to return to work, and it is obviously not their interest to do so until they are at least so far recovered as to be able to earn wages considerably in excess of the half-pay they may be receiving as compensation. The restrictions placed upon a man in receipt of sick pay are a direct check on malingering. He is subject to surveillance, he may not be out after certain hours, or walk more than a certain distance from his home, and the consequence is that his *otium* is enjoyed with a certain loss of *dignitas*. Now, seeing that these benefit societies are famed for their excellent management, and that their rules are framed by the men for the men in their own interests, it would appear that the Legislature might well take a leaf out of the men's book, and that some system might be devised by which a man in receipt of compensation might be given a similar incentive to go back to work. As it is, the benefit societies and the Act often work to their mutual disadvantage. The two are independent, yet the benefit society often is guided by the payment of compensation as a test of capacity; whilst, on the other hand, when an arbitrator is trying to compel a man to return to some work by reducing compensation, his object is frustrated by the man's being in receipt of sick pay.

The Report contains some very

practical suggestions as to the time for commencement of proceedings, but since it states that the "notice of claim" shall not be a step in the action, and as "proceedings" cannot be taken without special leave after the expiration of three months, it will be well in the Act to define what step is to be deemed the commencement of proceedings, to avoid questions such as that raised in *Parry v. Clements*. The recommendations as to the functions of medical referees are very important, and tend to substitute a medical tribunal for the present quasi-judicial tribunal which, in many cases, would be more effective. In paragraph 231, however, a clerical error seems to have crept into the Report. Where a workman is in receipt of weekly payments, and a dispute as to his capacity is referred to the medical referee, the Report states that the opinion of the referee is to be conclusive of the condition of the workman "at the time of his injury." It is obvious that this reference might be made weeks or even years after the accident, and the question to be determined is the workman's condition at the time of the reference, and earlier in the paragraph this is so stated. Before the Report takes shape in legislation, these and other minor points will no doubt receive full consideration, but attention cannot be too soon drawn to any suggested amendments, if a satisfactory measure is to be obtained at the hands of the Legislature.

NOTES.

Coast Protection. As we have before observed, a circumstance militating against the adoption of protective works in many parts of the Eastern and Southern coast-line is the small value of agricultural land. When the value of such property becomes increased by the extension of watering places, or by the development of new building estates, a solution for the problem is at once afforded. We believe that in numerous places the local authorities might do much for the protection of England from encroachment, by road construction parallel with but at a safe distance from the shore. At present it is by no means uncommon to find towns, villages, and hamlets on the coast entirely without direct means of inter-communication. An example of the kind is furnished by the towns of Worthing, Goring, Littlehampton, Bognor, and intermediate villages. Access between these places can only be obtained by circuitous inland routes, and we are certain that the construction of a continuous road along the coast would be of immense convenience, as well as serving to augment the value of land bordering the new highway. If the local authorities were to acquire the property on either side of the road at the present nominal value, the investment would be highly remunerative in the long run. The cost of the road and protective works would be repaid, further incursions of the sea would be prevented, and the popularity of the various places would be greatly increased. We have here considered merely a representative case, but very

similar conditions obtain along many other parts of the coast-line.

In an article which recently appeared in the *Times* on the growth of electric tramways, it was stated that some of the municipalities were contemplating the inauguration of parcels and goods traffic, and that one municipality was even considering the question of carrying coal. This appears only to be rumour at present, but it draws attention to a matter which might become a most serious abuse. As it is, our roads, both in towns and suburbs, are being used for nearly every purpose except that for which they were created. They form a convenient trough in which to lay all pipes and wires, and are generally kept open for this purpose. Tramways rush at high speeds down the portion of the highway which is not opened up, and motor-cars and cycles dash at higher speeds past the tramways. The normal vehicular traffic, and the pedestrians, are already much in the position of those who engage in an obstacle race. If goods and coal traffic is to be added to the use and abuse of the roads, a serious condition of things will be created, and it is, therefore, of importance that Parliament should see that Tramway Bills contain clauses restricting the municipalities from engaging in goods traffic. When the increase is considered in the number of tramway passengers, they having only amounted to 759,466,000 in 1896, whereas last year the number carried was 1,681,949,000, some idea can be obtained of what parcels and goods traffic on the roads might grow to.

Lightning Arresters.

THE extensive use of electricity in America to transmit power over long distances by overhead wires supported on wooden poles or iron standards has brought into prominence the importance of studying the effects of the electricity in the atmosphere. One of the greatest difficulties which the pioneers of this method of transmitting power had to overcome was the constantly recurring breakdown of the system due to short circuits caused by miniature lightning flashes from the wires to the nearest conductor in contact with the earth. It is now about forty years ago since Lord Kelvin showed, by means of his water-dropping electrometer, how rapidly the electric pressure in the air varied with the height above the surface of the ground even on days when the sky is clear. This rapid and erratic variation of pressure with height makes the working of transmission lines, especially those which vary greatly in altitude during their course, very difficult. Even when the line is not working the electrical surges set up in the wires by the atmospheric electricity have sometimes been great enough to do serious personal injury to the officials and to pierce the insulation of the generators and transformers on the line. To get over this difficulty "lightning arresters" are always used. In a recent paper in the *Electrical Review* of New York Mr. A. D. Adams gives a most interesting discussion of the theoretical principles on which these appliances are supposed to act. The form

of arrester which has come into general use with transmission lines in America consists of a porcelain slab with a row of small brass cylinders placed parallel to one another on it at distances of about $\frac{1}{8}$ in. apart. The top cylinder is connected with the transmission wire, and the bottom cylinder is connected with an earth plate exactly similar to the one used with lightning conductors. When an electric wave generated by atmospheric electricity comes along the wire it goes to earth by sparking over the brass cylinders which are sufficiently numerous and sufficiently distant apart to prevent the working pressure of the line from establishing an arc. Mr. Adams states that it is quite an ordinary sight to see the "lightning arresters" at a station connected with a long transmission line flash "scores of times" during a thunder storm, often with loud reports, and the flashing to be continuous for several minutes at a time. The very elaborate arrangements of these safety devices that are put up in connexion with transmission lines show that electricians are now fully alive to the dangers of the surges due to atmospheric electricity.

Paints for Structural Work.

SOME interesting results of an investigation into the durability of paints for the protection of structural ironwork were found in a paper recently read before the Franklin Institute by Mr. Robert J. chemist to the Philadelphia and Reading Railroad. Three types of paint had been used for several years on this line, and after various trials, it was found that ironwork covered with one variety remained in perfect condition after some four years service, while parts of the same structure coated with another quality of paint became very badly corroded. The general results suggested an investigation to determine the causes of the variation and to assist in the establishment of a specification for paint of satisfactory durability. Chemical analysis threw very little light on the subject, and resort was had to microscopic examination. Marked differences were then observed in the sizes of the particles of pigment, the three qualities of paint. Full particulars of the investigation are given in the *Journal* of the Franklin Institute, which our readers are referred to; but we may state that the point made by the author of the paper is that fineness of pigment is a very important element in the durability of the paint. Naturally the finer the pigment, the slower will be the drying process, and there is a degree of fineness beyond which drying would be inconveniently slow. At present, ordinary inorganic pigments are ground to a fineness which is far below the point at which a question that considerable improvement may be made without causing any risk of slow drying.

Indiarubber Paving.

OWING to its high cost the use of indiarubber as paving material can never become general; but in limited areas where the prevention of noise is of great importance, it has been employed with considerable satisfaction and ultimate economy. Perhaps the most familiar example of such paving is that on the carriage-ways passing beneath the Eust

tel. Laid nearly a quarter of a century ago, at a cost of about 5*l.* 8*s.* 6*d.* sq. yd., the rubber covering set until May, 1902, when the original thickness of 2 in. had been reduced in the middle of the roadway to about 1 in., and to $\frac{5}{8}$ in. at the places where horses step upon it from the macadam road. In consequence of the increased price of rubber the cost of covering the carriage-ways with the same quality of material as before was estimated at 2*s.* 6*d.* per sq. yd., and a cheaper quality was substituted at very little more than the original price. The material adopted is vulcanised rubber similar to that laid down in 1895 at Wellington Court, Knightsbridge, where it has worn well. In the courtyard of the Grosvenor Hotel the rubber paving, 2 in. thick, was laid at a cost of about 8*l.* 8*s.* sq. yd. In all the above cases the amounts mentioned are exclusive of concrete foundation work. During the life of the paving at Euston the average cost of maintenance has been less than 3*d.* per sq. yd. per annum. From these notes it becomes clear that rubber paving is by no means an extravagant luxury.

LIVERPOOL has wisely taken up the question of theatre safety with due regard to modern requirements and the lessons learnt from the Chicago fire some nine months back. It would be well if all the other larger provincial cities were to adopt rules of similar tenor. Birmingham and Manchester, we believe, have recently revised their regulations, those of Birmingham being essentially of a modern character. But where revised rules are really more required than in the large provincial centres is in the medium-sized provincial towns that perhaps have one or two theatres at the best, and perhaps an additional variety theatre. It is in towns of medium size that there is so much neglect at the present moment. We may take the opportunity of observing, however, that there ought to be some "model" regulations for adoption in all centres, so that the theatre manager, and more particularly the touring manager, does not find himself met with a curious variety of requirements in the various places in which he wishes to do business. As London is, one provincial centre requires blinkers; another does not require blinkers, but will not allow any scenery to the theatre that is not "flame-proof." One centre requires a certain class of electrical safeguards; another requires a different variety. Surely the time has arrived to standardise the requirements as to theatres, and there could be no great difficulty in doing this if the theatres be classified according to their size and their position in relation to public thoroughfares. Of course it is well known that the regulations of the London County Council frequently serve as a model in the provinces, but these regulations are not necessarily applicable everywhere to provincial requirements; in fact, very much the reverse, as the disadvantages as to site in many provincial theatres require special treatment, if even an ordinary amount of safety is to be attained.

Architects and Elementary Schools. AN important discussion took place last week at the meeting of the Education Committee of the Herts County Council as to the employment of an architect to prepare plans for and carry out the erection of a new "provided" school at Watford. It appears from the report in the *Watford Observer* that one party proposed that the work should be done by an architect, another that it should be done by the County Surveyor. Fortunately it was decided that an architect should be employed; but it was decided, as regards the erection of a "provided" school at Bushey, adjoining Watford, that the County Surveyor should do the work. The business of the county surveyor is mainly concerned with main roads, and this work alone, if it is to be done properly, is quite enough for one official. But for the satisfactory erection of a school an architect should be employed, one who has studied the subject, and not a surveyor who is an engineer by profession, and who is an amateur as an architect. The question is one of more than local importance, and we think the Institute should consider the matter, because the proper course for a county council is to appoint an architect to do their architectural work, either permanently or for each building as required.

A Cape Building Case. WE have received a report, published in the *Cape Times*, of September 6, of a case of *Skippon v. De Witt*, which contains the judgment of Chief Justice Sir J. H. de Villiers, in the First Division of the Supreme Court. It is interesting as showing how the same questions of building law are cropping up the world over. The action was brought by a builder against an architect to recover damages for incorrect quantities supplied by the defendant, who had acted both as architect and quantity surveyor for the building owner. This question has more than once come before the English Court, as many of our readers are aware, and it has been decided over and over again that when there has been no fraud on the part of the quantity surveyor, the builder cannot recover if the quantities are incorrect. This was also the judgment of Chief Justice de Villiers, who appears, however, not to have relied on any of the English decisions, but rather to have treated the case as a novel one. Possibly it may be so in the Cape Court, and, therefore, it may be regarded as a decision of some importance for practitioners in South Africa.

Croyland Abbey. For the past seventeen years, through the energy of the Rector, what remains of the grand Abbey Church of Croyland, in the Lincolnshire Fens, has been gradually repaired, the work having been carried out by Messrs. John Thompson and Co., of Peterborough. The lead roof covering the north aisle of the nave—now used as a parish church—was pronounced by the late Mr. Pearson to be in a very bad state, its thrust also endangering the side walls. This it is estimated will require a sum of 537*l.* to properly repair, and an additional sum of 240*l.* is wanted for two new windows on the south side.

For these sums, of which the first is the more important, an urgent appeal is now made, and considering the great interest of the building as a national monument, and the care which has been taken to preserve it to us in recent years, it is earnestly to be hoped that the required sum may be forthcoming. The sum is a comparatively small one, and should be easily raised if the needs of the building are made widely known. All sums should be sent to Rev. T. H. de Bœuf, the Rector of Croyland.

The Belle Vue at Brussels. THE Hotel Belle Vue, which stands at the north-east corner of the Place Royal at Brussels, has been purchased by the State, so that the house and garden may be added to the grounds of the Palace which adjoins it, in accordance with the plan for the enlargement of the royal dwelling and grounds. The demolition of the building will take something away from the symmetry of the Place Royal, since the Belle Vue is a kind of wing corresponding with a similar building on the north-west side. With the Belle Vue will also disappear what may be considered a historical hotel, for in 1776 Maria Theresa, Empress of Austria, granted to Philip de Profit the portion of the grounds of the ancient ducal palace, on condition that he should build on it in prescribed style a large hotel for travellers. In 1779 Charles de Loraine granted a piece of ground adjoining the hotel for the purpose of a terrace. So that the Belle Vue has been an hotel for more than a century, and during its existence has been the resting-place for all sorts of travellers, royal and otherwise. With it will disappear one of the most agreeable kind of old-fashioned hotels—spacious, quiet, comfortable—containing the comfort of the modern caravanserai, without its size, noise, and railway-station atmosphere.

Rushton Hall, Northants. WE read that an American gentleman has purchased Rushton Hall, near Kettering, of late years the property of Mr. W. C. Clarke-Thornhill. Rushton Hall, one of our finest examples of domestic architecture, was originally built in the XVth century by an ancestor of the great building squire, Sir Thomas Tresham; to that period belong the great hall with its circular bay, and portions of the lower two stories. In 1594-5 Sir Thomas Tresham enlarged the house, and inserted his device of the trefoil, the "*Johis languentibus herba*" of his kinsman's epitaph, with the figures "1595" in the straight gables. The dates "1610," "1618," and "1626" in other gables of somewhat similar detail commemorate the completion of the house, and after the then prevalent style, by the Cockaynes, of whom Sir William Cockayne, Knight, elected Lord Mayor in 1619, had bought the property, about 360 acres in extent, after its confiscation in 1605 from Sir Thomas Tresham's son, Francis, for his complicity in the "Gunpowder Plot." The Cockaynes possessed the estate until the close of the XVIIIth century, when it passed to Sir William's descendant, Lord Cullen. An illustration in our columns of November 3, 1888, shows the main elevation of Rushton Hall,

with the galleried screen which connects the two wings and so encloses the quadrangle. Rushton had belonged to the elder branch of the Treshams in the time of King Henry VI.; after the decapitation of Sir Thomas Tresham after the battle of Tewkesbury, it was seized by the Crown, but was restored by King Henry VII. to John Tresham. In a distant corner of the park, at the end of a long avenue of box and yew trees, whence the "straining eye" may see the Field of Naseby, is the singular building known as the Triangular Lodge, erected by Sir Thomas Tresham in 1593-5, and illustrated in the *Builder* of July 21, 1883, after measured drawings by Mr. J. Alfred Gotch. There is a tradition that Dryden wrote parts of "The Hind and the Panther" at Rushton.

DURING recent excavations of the Castle, whereof it was believed all vestiges had been quite destroyed. The remains consist of about 12 ft. of walling, having a return of the same length, built with off-sets, and constructed of the local red sand-stone. The Castle, first erected in the last decade of the 13th century, was exchanged by King Stephen to Ranulph de Gernons, Earl of Chester, for the old Castle, commonly known as John o' Gaunt's, at Chesterton, about two miles distant. The fabric was repaired and enlarged *temp.* John, who in 1206 visited the fortress, which on the Borough seal appears as a many-gabled building, largely constructed of timber. Leland mentions the survival of one great tower in 1530. The Castle was pulled down after the Civil War; of late years a part of the site, known as Castle-hill, has been occupied by some foundry works.

At the Fine Art Society there is on view a collection of water-colour drawings by Mr. Wimbush illustrating the Channel Islands. Without perhaps rising to what may be called the poetry of water-colour art, these are very charming drawings illustrating many beautiful and picturesque scenes, and the artist treats all classes of subjects with success—old streets, views of hill and bay, and garden scenes with masses of flowers in the foreground; the exception perhaps is in the one or two which are purely sea-pieces—rough weather pictures, not very powerful as sea-painting. Many of the quieter scenes, in which the blue Channel sea forms a framework to lovely coast nooks surrounded by hills, are most attractive, and the view of "The Town Church, St. Peter Port, Guernsey" (36) shows how well Mr. Wimbush can paint architecture. The assemblage of greenhouses which make Guernsey a kind of conservatory have been judiciously ignored. One result of the exhibition may be to lead some more holiday-makers to turn their thoughts towards the Channel Islands, here portrayed in so attractive a form.

REOPENING OF ST. CHAD'S CATHEDRAL, BIRMINGHAM.—St. Chad's Cathedral has been closed for a few weeks while the interior has been renovated. The builders' work has been done by Messrs. J. Barnsley and Son, of Birmingham, under the direction of Mr. Keogh, architect, of London.

BROCKLEY BRANCH LIBRARY COMPETITION.

The drawings comprising the designs, thirteen in number, submitted in limited competition for the proposed library to be erected upon a site adjoining Crofton Park station, have been exhibited to the public at Catford Town Hall during the present week. The competition has been instituted by the Public Libraries Committee for the Borough of Lewisham, and although the Committee is intrusted with the expenditure of public funds, it does not appear to have considered itself under any obligation to secure technical advice in the matter; the Committee has organised the conduct of the competition, and has adjudicated upon the designs submitted. No premiums were offered, and the statement of the Committee's requirements, which, together with a plan of the site, were supplied to invited competitors, are so brief that they may be here quoted in full:—

"The Committee invite designs for the erection of a new branch lending library, including reading and news rooms, also separate reading-room for juvenile readers (but without a reference library), also with caretaker's rooms, on an acquired site at Brockley (see ground plan enclosed). The buildings to be planned with a view to the best utilisation of the site and possible future extra accommodation; the cost, including fixtures, fittings, architect's and quantity surveyor's fees, is not to exceed £5,000."

The site does not lend itself readily to successful planning. It is a right-angle corner site with a building frontage of about 30 ft. only, on Brockley main road, and of about 104 ft. on Darfield-road, which we understand to be an unimportant bye street. At that end of Darfield-road frontage which is remote from Brockley-road, the site is some 82 ft. deep, so that the building lines show a triangle with a truncated apex on the chief roadway. The competitors have had to decide whether they should contrive their main entrance in the 30 ft. frontage upon the important Brockley-road, or consider this sentiment immaterial when opposed to the greater economy and convenience of plan afforded by arranging the main entrance opposite the heart of the site in Darfield-street. On this point competitors have proved themselves divided in opinion, and it may further be said that the limit of cost mentioned in the "Memoranda of Instructions" has been to a very large extent ignored by them. Very few indeed of the designs could be carried out for a sum approximating to the limit fixed by the Committee.

The design which has been numbered 9—the work of Mr. Albert L. Guy, of Gray's Inn—has been selected by the Committee, and we understand that the appointment of Mr. Guy as architect has been confirmed by the Council. We are inclined to think, on considering the drawings submitted by Mr. Guy, that the Committee have been guided in their choice by the fact that Mr. Guy's design is the least objectionable of those few designs in which are found combined a main entrance into Brockley-road and a character and dimensions which hold out some hope that the work may be executed at the stipulated price. These advantages Mr. Guy's design offers; but we find it hard to congratulate the Committee on the result of the competition. The selected design entirely lacks character and style in its architecture, and shows few conveniences in plan. A lobby immediately inside the entrance gives direct access to a wide corridor in continuation of it, which affords access to reading and magazine rooms on the left, and forms a space for borrowers using the lending library, whose counter limits this space, upon the right. This counter is 36 ft. long, and the lending library is 16 ft. 9 in. wide. The reading-room for juveniles is at the end of this space, opposite the entrance lobby, and has a separate entrance from Darfield-street. All reading-rooms are well placed for thorough supervision from the lending counter, but there is no librarian's room or office, work-room, binding, or other room or store on the ground floor. A staircase opening into the staff entrance lobby leads to an ill-lighted basement apartment allocated to "staff," with lavatory accommodation convenient thereto. The requirements of the elevations, rather than the needs of the caretaker, surely have endowed that official with a suit occupying an upper floor placed over the salient portions of the building, consisting in scullery, kitchen, offices, living-room, and two bedrooms. The style of the building shows Elizabethan proclivities, with a Dutch gable, and is rendered in red brick and in what would suggest itself to be Bath stone, but which we

understand to be intended as Portland stone. The design lacks distinction or scholarship. The requirements as to future extension seem to have been disregarded.

We will do no more than refer to a design numbered 8, which shows a school elevation in Portland stone of a two-storey building—an impracticable quality in a library of this size and character; or to the design numbered 5, also in Portland stone, an elaborate design of merit, which soars beyond proper matters of cost (though not disdaining to present a conspicuous but really well-devised tower, a gas meter and the caretaker's stairs); or to the drawings numbered 3, wherein are sharply delineated elevations, simple and monumental, in brick with economical Portland stone dressings, but with plans which are fatuous and impossible.

The designs in which competitors have arranged their main entrance in Darfield-street are for the most part too elaborate and costly, of dimensions which place them outside consideration, but we think it would have been well if the committee had disabused its mind of obvious prejudice against the entrance from Darfield-street. When all is said, the 30 ft. frontage of a building will not predominate 100-ft. frontage because its entrance is placed there. It is also obvious that the absence of an entrance on the Brockley-road frontage gives just that importance to the Darfield frontage which may detach the building from its surroundings. If the committee had seen the matter from this point of view, they might have fixed their choice on the design numbered 4, and thereby have obtained an economical building with an eminently convenient, not elaborated plan, and an elevation which would have a sufficiently monumental character without any suggestion of extravagance. The author of this design has placed his entrance in Darfield-street, somewhat remote from Brockley-road. A compact lobby gives entrance on the right hand to news and reading-room and on the left to the junior readers'-room, and leads direct into the space allotted to borrowers, counter and the lending library are on the right hand, and upon the left hand is space designed to be occupied by a future reference library, other extension of the buildings. There is a small librarian's office convenient to the counter, a work-room and lavatory access from the lending library. A separate entrance and apartments for the caretaker are arranged on the first floor, affording a gable over the entrance bay. The roofs are finished by a reasonable economy ignored by all, or almost all, other competitors.

We are afraid the committee has missed the chance of securing for Brockley a well-designed, economical, and convenient library, and will be accountable for the erection of a building which lacks character and practical convenience in plan.

MAGAZINES AND REVIEWS.

THE Art Journal devotes some space to illustrations of electric light standards and fittings by different firms, under the general title "Electric Light and the metal crafts." The writing, however, is little more than an appendage to the illustrations. Some of the designs are good; but there is nothing of first class inventive artistic character about them, and this is hardly surprising when we consider that they are only the productions of firms and that no artist's name is given in connection with any one of them. The most distinctive characteristic things are the wood fittings noticed by Mr. Henry, some of which we have already noticed with approval. "Northumberland's some Artists"; "The National Gallery, Scotland" (especially in regard to its French paintings); and "George Morland," are subjects of three other articles. The connection between France and Scotland in the XVIIth and XVIIIth centuries would have one to expect an even larger representation of French art of that period, in Scotland, actually exists; but the Scottish gallery includes some very fine and celebrated works of Watt, notably his "Fête Champêtre," with its curious and dramatic contrast between the stately and brocaded living persons and the stone nymph on the terrace wall. Was it intentional satire on Watteau's part, or was his nymph merely decorative? We do not know whether Mr. Cundall, who writes the article on Morland, does not give a reason

aggregated estimate of his genius—that is, what might have been possible to him had he avoided dissipation and low company. The fact that he had those preferences seems rather an indication that his genius was not of the highest, or it would have held him above that level of life.

The *Burlington Magazine* includes an article by Mr. Binyon on "Drawings of the Norwich School at the British Museum," with illustrations of two fine and interesting drawings by G. C. Brown and Cromie respectively. Mr. Clouston's "Minor English Furniture Makers" (III.) deals with the work of Ince and Mayhew, and, judging from the illustrations given, may be said to have represented the faults of the period (which were very serious ones) about his merits. The style of these is about as bad as can be, and it is time that the fashion of admiring this kind of work was given up. J. H. writes an article on the Ionides Collection, an article containing some good technical suggestions. While we agree with him that Rousseau is very unequal, we should regret that the same might be said of Diaz, instead of merely dismissing him as an over-rated painter. Diaz at his best is so remarkable a scape-painter, with a style so intellectual as to especially his own, that it is difficult to over-rate him; but it is not very often that we find him at his best. What the writer means by calling that *farceur* Monticelli a follower of Diaz, and suggesting that Diaz will ultimately place below him, we cannot imagine, except that art-critics seem in the present day to be merely going off their heads in the perversity of seeing beauty in what is crude and ugly. An article on the lace collection of Mr. Blackstone is accompanied by illustrations of some of the most curious figured lace (Venetian point) illustrating the Story of Judith, and also the use of unsuitability of figures to lace-work. The illustrations also of some perfectly exquisite lace of purely decorative work in the same class of lace.

The most interesting illustrations in the *Miner Architekturwelt* are those of the restoration, by Professor Otzen, of the ancient brick masonry chapel of Heiligengrabe; a fine piece of work with a lofty stepped gable at the end, and a heavy brick vaulted interior the lower portion, which has been repaired, painted, and decorated. Among the modern buildings illustrated, a very pleasing one is a school and master's house in the Christianstrasse, Berlin, by Herr Hoffmann. Here at least there are none of those architectural details which so often disfigure modern German buildings; it is a lofty T-shaped façade, feetly plain except in the three gables which form the centre and wings, where a specially rich treatment contrasts effectively with the expanse of plain wall below. Two illustrations of sculpture from the Berlin art-exhibition of this year are very good; a bull in bas-relief by Herr Spieth, and a "Kugelspieler," a nude youth balancing a ball on his arm; but these have a classic purity and dignity of line which is essentially sculptural. There is some really good furniture from the St. Louis Exhibition, designed by a Berlin architect, Herr Nachtlicht, and something new and effective in the way of a fence and wing in front of a street house, designed by E. Bernitt and Lange. Those who are concerned in providing decorative house-ings should look at this; it contains a good deal of suggestion.

In *Technics*, Mr. H. F. Parshall and Mr. H. M. Bart commence a serial article upon "The Dynamics of Heavy Electric Traction," dealing chiefly with train resistances at various uniform speeds. Several diagrams are given containing views based upon results afforded by the high-speed line at Zossen, the Central London Railway, the City and South London Railway, the New York Central and Hudson River Railway, and other lines. These diagrams show that there is now a fairly general agreement among engineers as to the total tractive resistance on well-built modern railways and their normal conditions. This series will be followed with interest, in view of the rapidly increasing employment of electric traction. A short contribution by Mr. Percy Longmuir deals with the "Influence of Casting Temperature on the Properties of Metals," and may be regarded as the continuation of a paper read by the writer in 1903 before the Iron and Steel Institute. Since that year the investigations have been continued to the examination of various commercially pure metals, and the

results now stated represent matter that has not been published heretofore. The value of the present records is indicated by the fact that, in the case of a fragile metal like zinc, a fall in casting temperature of only 37 deg. C. was accompanied by a decrease in maximum stress equivalent to 956 lb. per square inch. Variations in the case of aluminium appear to be chiefly shown on the extensibility of the metal, while the highest maximum stress in copper is coincident with the lowest casting temperature adopted by the writer. "Dampness in Houses" is the title of an illustrated article by Mr. Rufus E. Marsden, who presents a series of notes on the prevention and cure of dampness. The suggestions made are familiar to all practising architects, but should be of service to students. Mr. E. Flander Etchells continues his series on the "Theory of Structural Design," devoting attention to "Pillar Formulae." The object of the chapter is to compare Gordon's formula with a rule given in a previous instalment, and to elucidate the application of Mr. Shaler-Smith's sliding factor of safety formula to Gordon's rule. This is essentially a chapter that must be read in conjunction with those preceding and, probably, succeeding it. There are several other articles of considerable interest in the same issue, especially "Electric Lamps," by Mr. James Swinburn, wherein the Nernst lamp is fully described; "The Chemical Analysis of High Speed Steels and Alloys," by Mr. Fred Ibbotson, a subject of much importance to mechanical engineers; "Electric Waves," being Part III. of a series, by Professor J. A. Fleming; and "Starting Resistances for Shunt Motors," by Mr. George W. Howe, a short contribution giving rules for the design of such apparatus.

Public Works contains an admirable article on "The Public Baths of Ancient Rome," by Mr. Thos. Asby, jun., of the newly-established British school at Rome, who has been several times a contributor to our own columns on subjects of Roman archaeology. The electrification of steam railways is the subject of a long article by Mr. F. F. Bennett, containing a large number of statistics as to comparative cost of steam and electric working, and other questions incident to the subject. Mr. Bennett thinks that an accelerated and more frequent service could be obtained on the electrical system, which would result in a much higher percentage of passenger load in relation to the means employed to convey them. It does seem, as he says, rather absurd to employ a conveyance of 200 tons weight to convey 2½ tons of people about, and that is what he maintains that the present train system, on the average, amounts to. But we do not see that electrically worked railways could do so much to modify this condition of things. The composition of trains should be a little more elastic. Except on long distance journeys, there are certain times of the day when trains are always full, and others when they are generally nearly empty. It may be, however, that the extra work and time entailed in altering the composition of trains would more than compensate for the saving in haulage. Towards the close of the article the author threatens us with the bogey of State ownership of railways, which is every now and then put forth by railway economy theorists; and against which we protest. The public would not be nearly so well served by the State as it is by most (though certainly not all) of the great railway companies. Mr. A. T. Walmisley, the engineer to the Dover Harbour Works, contributes a long and amply illustrated article on the subject of groynes for the preservation and regulation of sea-beaches, which is attracting so much attention at present.

In the *Independent Review* Mr. T. C. Horsfall writes a very good article under the title "Housing: Lessons from Germany." The Lesson from Germany is put definitely in the form of the plan for suburban improvements of the town of Kassel, in which the plan is coloured to show "existing buildings," "buildings to be removed," "close building," and "open building." The point is that in Germany the town authorities put forth a carefully considered plan, on a comprehensive scheme, for the improvement of a town, and that such a plan includes the reservation of certain streets and areas from close building in long rows of houses. Commenting on their example, Mr. Horsfall says:—

"It will not suffice to ensure that in new districts the dwellings shall be free from structural defects and faults, shall be adequately lighted, ventilated, and supplied with wholesome water and with sanitary

arrangements. Far more than this must be done. The new districts must be so wholesome and pleasant, that few or none of their inhabitants shall be tempted to get drunk, for the purpose of escaping as quickly as possible from the influence of their environment. The building of long unbroken terraces of small houses must be stopped. All dwellings must have within easy reach a broad, tree-planted street, and a pleasant open space, where parents and children may get air and exercise, and feel glad that they are alive. One of the problems which must be solved, if the new parts of towns are to be made and kept wholesome, is that of ensuring that the dwellings of people of different social classes shall be intermingled. The experience of all large English manufacturing towns shows that a high degree of civilisation cannot exist in a large district which contains only the dwellings of working people. In such districts, grave evils are caused by the lack of knowledge on the part of each family of kinds of life fuller than that which it lives. And, as where each house is small, the streets are necessarily narrow, and little or no planted open space can be supplied, ignorance of nature as well as of full human life necessarily prevails."

Further on, in reference to the same point, after speaking of the necessity for having comprehensive "extension plans" of towns, Mr. Horsfall says:—

"I know that at present in Manchester, and doubtless the same kind of feeling is found in other towns, a considerable number of persons who desire to take part in the work of providing wholesome dwellings, are prevented from building by the conviction that, if they provided a number of well-built, well-arranged dwellings, these could not long be wholesome and pleasant homes, because before long they would be ruined by the miserable surroundings and the foul air which our municipal authorities at present allow to invade all new districts. If professional builders and well-to-do persons of public spirit did not provide a sufficient supply of dwellings, it would be easy for the central and the municipal authorities, by encouraging the formation of such building societies of public utility as are now doing much good work in Germany, and by enabling them to obtain loans at low rates of interest, to give a great stimulus to the supply. And in the new, well-arranged districts Town Councils could safely build a large number of dwellings."

In the *Nineteenth Century* Mr. Wilfrid Blunt writes an amusing and sarcastic article on "By-law Tyranny and Rural Depopulation," based on his own experiences as a landlord. Whether he is right in considering that the want of adequate habitations has had an influence on depopulation is a very large question. What is of more direct interest is that he found that he could build healthy and comfortable cottages of iron at 130l. each, and has had to relinquish it at the bidding of the District Council. One may shudder (aesthetically) at the idea of iron cottages in a country district; Mr. Blunt says he had them painted green and that in general treatment they were not ugly; "the cottage occupants were delighted with their new dwellings, and all the neighbours envied them their luck." Mr. Blunt was vaguely cautioned by the authorities, who, however, said "there appears to be no objection to your proposals."

"Yet this is what has happened. During my absence last Christmas in Egypt, my builder, having nearly completed his task, was summoned to the Council's instance and fined 5l. at East Grinstead for the offence of building otherwise than with bricks and mortar, and on my return a further action was brought against me on the same charge, which resulted in a continuing penalty of two shillings a day being imposed on me so as to oblige me to pull the building down. The grotesque result was therefore reached that on the strength of a public health Act, designed to secure the better housing of the poor, a building against which no charge that it was insanitary could be brought—indeed the charge had been expressly repudiated—was condemned, not because it was not good enough, but merely because it was too good. The sole evidence brought by the prosecution was that of the district surveyor, who deposed that he had measured the building and found it was larger in area and contained more cubic feet of air—that is to say, that it was a better and, according to all modern sanitary views, a healthier building—than the Council's curious by-laws allowed to a single-storied cottage not of brick or stone."

Mr. Wilfrid Blunt's cheap cottage experiences come up again in an article in *The World's Work*, which seems to have been suggested by this special case. A photograph is given of the half-demolished cottage, and a rough plan and section of it as intended. The plan certainly betrays the amateur architect, for the rooms are simply placed in a row, and one bedroom can only be reached through an outside door or through the other bedroom. We fear the plan leads us to think that there may have been more justification for the official condemnation than Mr. Blunt quite recognises; but this does not affect the main argument. There is very little doubt that the application of cut-and-dried building by-laws in country places will have to be reconsidered before long; too strong a case has been made out against them. What is wanted, however, is not the abrogation of any by-laws, which would be a dangerous experiment, but a greater elasticity given to their requirements, and a power to the surveyor of exercising special judgment in special cases. The same number contains an article on the Jungfrau electric railway, with illustrations.

In the *Century* Miss Edith Wharton concludes her series of articles on Italian villas by one on "Venetian and Genoese Villas," with pictures by Mr. Maxfield Parrish, along with other illustrations. The illustrations, with their combination of water, balustraded terraces, heavy masses of trees, and dignified bits of half-crumbled Renaissance alcoves, are most fascinating. The same number contains an article by Mrs. Pennell on Mont St. Michel (under the title "In the Peril of the Sea"), with black and white illustrations by Mr. Pennell which are of the first order—masterpieces of pen line drawing.

Scribner publishes an interesting article on the foundation and development of the Royal Academy, from the competent pen of its Secretary. Under "The Field of Art" Mr. Frank Fowler contributes a short article on G. F. Watts which is one of the best we have seen on the subject; a sympathetic criticism, and not a mere piece of idol worship.

Harper publishes what is called "a critical comment on 'Othello,'" but as it is by Mr. Swinburne, the reader is not surprised to find that there is more of enthusiasm than of criticism in the usual sense of the word, though there are some fine suggestions in regard to Shakespeare's treatment of the original legend, and his probable or possible reasons for altering it. However, our special concern with the article is that it is accompanied by illustrations by Mr. Abbey. As in some other instances, we do not think Mr. Abbey is very successful in the portrayal of Shakespeare's heroes; his Desdemona is disappointing; but on the other hand he gives a very fine and remarkable study of Iago, which forms a plate by itself.

The *Fortnightly* contains a short but remarkable article by M. Mactierlinck (translated) on "Rome." We cannot give a *resumé* of an article in which almost every sentence embodies an original thought; but we recommend it to thoughtful readers, it will give them some new suggestions about Rome, both in the antique and the Renaissance phase of her wonderful history. The same number contains an article by Mr. E. V. Heward on "The Belted Giant of the Solar System," summing up in a non-technical manner the present position of our knowledge as to Jupiter. One circumstance is mentioned which many readers, even interested in astronomy, may not be aware of—viz., that the occultation of a star by Jupiter is not instantaneous, the star being more or less visible for about ten seconds after the limb of the planet has covered it; a convincing proof of the vaporous condition of all events a great depth from the surface.

The subject of Rome comes up again in *Longman's Magazine*, where "F. R. C. S." writes a most eloquent and picturesque article under the title "The First Sight of Rome," which should be read by any who have this "first sight" in immediate expectation. As the writer says, the first sight of Rome is a tremendous event in any man's life, "and he would be a fool who should go to Rome offhand, without forethought, without reverence, without study." We fear there are many such fools. "F. R. C. S." suggests that the passengers, like the baggage, should be examined at the frontier, and the stupid ones, who have no business to see Rome, sent back, for further study, to Basle; "it would be difficult to find a worse punishment"; but the reason for this special animus against Basle does not appear. The examination suggested would at all events have stopped out such visitors as the English lady who observed—"Rome is very nice now; you can get everywhere by trams."

In the *Contemporary Review* we read with a certain refreshment an article by Mr. E. Wako Cook on "Progress or Decadence in Art," in which he has said the plain truth in regard to the present absurd craze on the part of art critics and some artists who mistake decadence for progress, and imagine that ugliness, crudeness of colour, and bad drawing, are signs of a regeneration of art. The article is forcibly written, and expresses what probably a good many people really think, only they do not like to be out of the fashion. Mr. Cook's characterisation of Whistler, though perhaps a little exaggerated, is we think not very far from the truth. He thinks Lowell's description of Edgar Poe would fit Whistler very well—

"Two-fifths of him genius, and three-fifths sheer fudge."

The *Antiquary* contains an article, which we hail with delight, on "Miss Marie Corelli as an Antiquary." As the writer says, "there is no particular sin in not understanding mediæval

church architecture and its various accessories, but to write at length on topics of which you have not even an elementary knowledge is a downright evil, particularly if you have succeeded in gaining the ear of the less educated and less refined of the novel-reading classes." Some of the instances given are delightful. An article on "The Early History of Panoramas," by Mr. G. L. Apperson, deals with a curious and rather novel subject. The name of de Louthembourg is connected with one of the most successful of these shows, the "Eidophusikon," which appears to have attracted both Reynolds and Gainsborough, the former recommending any of his lady friends whose daughters cultivated drawing to take the girls there, as "the best school to witness the powerful effects of nature"; though why nature herself would not have done as well one does not understand. However, de Louthembourg was a landscape artist of some power, and probably was able to give to his panorama something more of real art than was commonly found in such displays.

The *Pall Mall Magazine* contains a picturesquely written article by Mr. W. Hyde on "The Thames at Night," accompanied by some fine and effective illustrations drawn by the author.

To the *Gentleman's Magazine* Mr. McInnes contributes a historical or biographical sketch of "The Duke of Bridgewater and his canal."

LIVERPOOL ARCHITECTURAL SOCIETY.

THE opening meeting of the session was held on Monday, the 10th inst., when the President for the session, Mr. P. C. Thicknesse, delivered an address. After commenting briefly on some local subjects of interest, Mr. Thicknesse continued:—

"I take it that no one in this room will deny his interest in architecture itself, and it follows that none can do other than admit his interest in the way we all, young and old, do our part in carrying on the work of architecture. To say to us that all our enthusiasm and energy ought to be devoted to our mistress would only be to repeat a platitude. I speak to everyone here, because some of our young members need perhaps teaching or reassuring of this, and our elder members will not mind being reminded that we can do no good for so great a mistress, if we are not wholly and entirely devoted to her. However long we may have been working for her and for her interest, we can never be so perfect in knowing her thousand sides and thousand interests that we can be sure of having mastered all the departments into which her service leads us.

"Our enthusiasm should, in my opinion, be great enough to make us put aside the mercenary idea that we shall make a fortune out of her, and make us well content if we make a livelihood. I am sure anyone entering our profession who does not believe this, but comes among us to make money, would be far better breaking stones—at least, so far as architecture is concerned. The most successful architect is the man who designs most the beautiful, comfortable, and well-arranged buildings, not the man who makes most money out of it or 'lays the heaviest burden on the earth.' Some few, very few, have made a fortune out of architecture; but, when we look back and think of the work which lives, and which we all admire, is it not the work of men who have worked, not for the money they made, but for architecture—men who loved their work and worked for it entirely? There is too much of this mercenary enemy to blaspheme against us—the enemy who will think, whatever we may say or do, that we make a building more expensive in order to make another shilling for every extra pound we make our clients spend on the building. This is, of course, a most absurd idea, but it is said and, I think, believed by many. However untrue this may be, I think it is true that we some of us think of a job as bringing us so much money, when we should be thinking how best we may serve our employers and architecture.

"The real difficulty of our work, as indeed all knowledgeable men must recognise, is the difficulty of knowing sufficiently about the numberless trades and materials we are dealing with in every building we work on, as well as knowing the particular uses to which the building we are constructing is to be put. To find out these latter really well is often almost impossible, for we should know—and know it more than superficially—how every room is to be used, and what each man in it has to

do and how he does it, and, therefore, to be able to imagine the story of his life in the room.

"I understand that this is felt so greatly by some of the men we most look up to for the beauty of their work, that, in order to minimise the number of the subjects they must understand, they have given up looking into many practical parts of building and leave to other anything which does not strictly belong to the design part of their work. Kitchen ranges, sanitary fittings, and the like are too dull, perhaps, for an 'artist' to know about; still, as they are a part, and a most important part, of a building—for who wants to live in the most lovely of houses and have a kitchen range that sends your mutton up either raw or baked hard?—I cannot see myself how a building is to be designed unless these things are made into our thoughts as the beauty and utility of a room, the drawing-room chimney-piece, or the strength of the foundation. The whole an every corner of a building must be thought out and arranged for by the architect, or the building will be a failure—a failure artistically as well as practically, because it cannot be really artistically good unless it is fitted for its purpose in each and every detail, however small that detail may be.

"I have heard of an architect (then may be many) who had a committee, sent to speak of all trades, with him as chairman, to carry out the work. This plan, no doubt, is an excellent one in theory, but I fear that in practice it would be found to waste time and lead to difficulties in extras and other matters. Of course, there can be no doubt that the most ideal of all arrangements for a building would be that an architect should have only one building at a time, that he should live on the job, and think and do nothing else until he has finished it—become, in fact, a glorified clerk of works. But we must live, and I fear we should have but little butter and no jam on our bread out of our 5 per cent. if we carried out that plan. However, if this could be done, then our friend's committee would be excellent; but, until we get to so high a state of perfection as that, I am afraid that we must work as we are and know as much of every man's work—as trades and all materials—as possible.

"Of 'ghosts' I will not speak for since Pecksniff we have been made sick with the talk of ghosts. We all know that delightful conceited chap who thinks he does all the work of the office and says so. We don't believe him, and in most cases find, when he leaves, that his master does the same work—often excellent—whilst he did before.

"I am so little afraid of being said to keep a ghost, that I am going to lay myself open to the charge of saying that many go too far in the opposite direction and make assistants and pupils into hands instead of helpers, and thus make our offices too 'officey,' not enough like ateliers. I heard of a man the other day who made one of his assistants into a drainage man, to do nothing else but drains. And certainly men often come into our offices who have never seen any building they have been working on in course of construction, and know no more of it than the drawing they have made. The effect of this way of working is to stifle all interest in and enthusiasm for architecture and their work, and to make them machines who care only for the drawing and not for the building, and whose duty it is to be in a certain place at, say, nine o'clock, have an hour for luncheon, and leave at 5.30, unless their chief is out, when they run away, or play cricket in the office as soon as they are sure he won't be back or find out.

"Now, that this state of things happens even in a few offices may be partly because the younger members of our profession are not conscientious enough; but I am sure it is more the fault of the system under which some try to work; this system which makes the assistant and pupil drudges, and instead of encouraging interest in our work, stifles it and makes architecture appear as a grind as hard and uninteresting as continuous tracing. It is a system which is bad because it is to the disadvantage of everyone concerned and of the work itself. The master architect gets his work done by men whose real interest in life is outside his work (and no man can do good work, however conscientiously he may try without interest in it), and hence the mechanical, often wonderful, drawings, made more or less like the architect's sketch or small scale drawing. No, I say it without fear of contradiction, there is only one way to interest a man

architecture, and that is by interesting him in the building and not in the dull paper representation of it only. Can there be anything more futile (and it is the outcome of this system) than the design of what I call a paper architect, who only makes drawings, plans, elevations, and sections, which might as well, as far as he is concerned, be carried out in brick, stone, or terra-cotta, wood, or even Wilsden paper? Let us see the work of such architects every day. The man has not even thought of it in perspective, and never as a building, only as a series of drawings.

"We are all students—or should be: heaven help us, if we are not. Then let us treat our pupils and assistants as junior students, and try to teach them while they are doing our work; not only teach them by getting them copy our drawings or correcting theirs, but also by letting them know the why and wherefore of all the work. Let them help us through every part of it. Let them have a change of one or more jobs, and stick to them from beginning to end. Let them see the estimates, know how we have to reduce them, know the prices of the work and each part of it. Encourage them to know everything connected with the buildings, and, above all, to see the building they are working on, in office hours, as it proceeds, and find out how things are done, both in the office and on the building. We shall then have men interested in their work and our work. They will feel their responsibility to the work. They will be working for themselves and us at the same time. I don't say I shall put old heads on young shoulders—I could be the last to wish to see it done—but there is plenty of room both for cricket and football, or more serious things outside our profession, as well as for architecture and the kindred things belonging or allied to her. I can say for myself that, when an assistant here in Liverpool in Mr. Doyle's offices, I had these advantages, and, although I was an enthusiast before, the system under which I worked there published my interest and my feeling of responsibility for my work, and I feel grateful for it."

"You may say this involves more trouble; quite agree. But I say it is worth it—a thousand times worth it—because it interests the younger members of our profession, and thereby helps the cause of architecture, and that should be even a greater thing to us than the little bit that we are doing. I would even go further, and encourage assistants and pupils to design parts of the work. The whole conception the architect himself must do, but let the assistant pupil do parts under the architect's correction. That will make him feel still more as the work were his own. My whole object is to make more interest for every man connected with us in his work."

"This is only the beginning of what would wish to see done. I would interest contractor, clerk of works, mechanics, and even labourers in the work. These mechanics, for instance, work in an exaggerated way in the same way in which many, I fear, our assistants and pupils work. So many bricks must be laid in such a way, and they do no more than the bricks themselves at it is to come after; they have no interest in their work; it is dull drudgery. Many of us complain that our workmen are not like the men of old. Why? Because they have no interest in their work. They make mistakes, and we call them fools; they do bad work, and we call them other names. It may not be our fault, but it is not theirs, and we shall never make it any better till somehow interest is brought into their work."

"To the assistants and pupils I say this, as well as to the master architects, because we must all work together—the whole of it is unity, the work being the work of collection of men under one head, who is responsible to the world and his employer for it. If the younger members won't help, it is most impossible to carry on work in the way I describe; for, if every man does not feel his interest and responsibility, and that he is on all honour to play fair with his chief, then he can't work unless under compulsion."

"The very nature of beginners' work is necessarily dull and boring, and though much has been done to interest beginners by that most excellent plan which Professor Simpson instituted and carried out so successfully at the University, interesting men in architecture and teaching the rudiments of the most congenial parts of our work in a way not possible in an office, yet even now it must be an ugly drop to come from making designs and details for themselves

of pleasant parts of a building to the often rather sordid little details of out-of-the-way corners of a building, or tracing sheets of full-size details which they have hardly time to study. But I would say, feel the work as your own, and the interest comes at once. If it is only a coal-cellar door, it has its own story; it must, for instance, open out, or it won't shut; there is a reason for each part of it and a story belonging to the whole, and it will help your imagination to rise to do more interesting things well if you will find out that story. It is imagination to throw yourself into every man's use for the thing you are designing, which is the greatest thing you can teach yourself. If the work is interesting, you will find your office hours too short, and you will not spend your time in wondering when five o'clock will strike."

"Many of us complain of the small amount of old work there is to be found up here. Surely there are heaps of things, new and old, good and bad, to study and criticise, if we will only look out for them. I would say, also, go to the contractor, clerk of works, or foreman on a building, and he can, and I have always found will, gladly show us many things which will help us to learn building."

"For be sure of this at least—that building without architecture may be a poor thing, but architecture without building is nothing. You can't make a thing really beautiful if it won't stand, nor if it is not beautifully fitted for its work."

"My subjects have been interest, enthusiasm, and a greater sense of unity in each office, and a little more feeling of fellowship between the younger and elder members of the profession; may I say, also, that I would like to see rather more fellowship and friendliness among all our members, young or old. I feel this as an important, the most important, part of the use and work of our society; for, if we met more, and knew each other more, we should like each other, I am sure, and be more united, and help each other more to work heartily to the great aim of our existence—the improvement and development of architecture."

THE PRINTING-HOUSE, CAMBRIDGE UNIVERSITY; AND THE "PITT" PRESS BUILDINGS, 1804-1904.

WITH the close of the current year will terminate the existing partnership in the printing and publishing businesses of the University Press between Mr. John Clay and Mr. C. F. Clay and the University of Cambridge. Some changes will be made in both businesses, and a new building is to be erected on the south side of Silver-street. The business of the University Press has been conducted in its present locality during the past 250 years, and on the existing site between Silver-street and Mill-lane since 1762. In that year the White Lion inn, on the south side of the former street was purchased, and the erection of the existing buildings was begun just one hundred years ago. The press has its origin from a grant made by King Henry VIII. in 1534 to the University of the right and privilege to appoint three printers or "stationers." Until the middle of the XVIIIth century the University printers did the work in their own homes. John Siberch, the first to be so appointed, lived in the Royal Arms, since incorporated in Gonville and Caius College, opposite St. Michael's Church in Trinity-street. Another, Thomas Buck, worked in what had been the refectory of St. Augustine's Priory, situated between Luthburne, since Free School, lane, and Slaughter-lane, now Corn Exchange-street. The Friars' refectory—afterwards the site of the Museums and Natural Science Lecture Rooms—is plotted in Hammond's map of 1592. In 1655 the President and Fellows of Queens' College leased to the University a parcel of their garden-ground on the north side of Silver-street, shutting also on the east side of Queens' lane, whereon John Field, appointed as printer in 1654, built his workshops, around the old almshouses in Silver-street, which Carter, writing in 1753, describes as being "now in use." Some forty years afterwards Field's shops were extended on the north-west side by the erection of workshops along the east side of Queens-lane, opposite Queens' College; in 1716 those later shops were made over for use of the Professors of Chemistry and Anatomy. James Gibbs's plans of 1715 for a senate house, library, schools, etc., comprised a new printing-house to occupy the south wing on the King's-

parade site, but that portion of his scheme was not carried out. In 1762 the University authorities purchased the White Lion inn, on the south side of Silver-street opposite Field's shops, for the building of new printing works. In 1821 the Syndics acquired for 5,060l. the adjacent site of the Cardinal's Hat, or Cap, inn, which had a frontage to Trumpington-street, eastwards, and extended to a considerable depth westwards, between Silver-street and Mill-lane on its north and south sides respectively. On that ground James Walter, architect, erected in 1826-7 the buildings which stand on the west side of the quadrangle—the courtyard has been roofed-in since—and a house in Mill-lane for the master-printer's residence. In the meanwhile the Senate and a committee of subscribers to the William Pitt Memorial Fund had agreed to devote the surplus, after payment of 7,000l. for Chantry's statue, set up in Hanover-square in 1831, to an enlargement of the Press to be called by his name (see Willis and Clark's "Architectural History of the University of Cambridge," 1886). Seven architects were invited to submit designs. In 1829, E. Blore's were chosen, and, a sum of nearly 12,000l. having been expended in buying more ground, the new Pitt Press was opened by the Marquis of Camden, Chancellor of the University, on April 28, 1833. Blore's building, facing Trumpington-street, was erected at a cost of 10,711l. 8s. 9d. The main façade, constructed of stone, is after the Late Perpendicular style; the block contains three floors, and has a lofty central tower. Further extensions were made at the rear on the site of Black Lion-yard in 1863 for the type-foundry, and nine years afterwards for a machine-room and warehouse on the site of Diamond-court, both on the Silver-street side. Then in 1877-8 was erected the large building in the south-west-corner of the quadrangle, after Mr. W. M. Fawcett's plans and designs, and some alterations and additions were carried out eleven years ago by Mr. Henry Dawson, architect, on the contract of Mr. W. Tindall, of Cambridge, for 6,184l.

VERIFICATION OF STANDARD MEASURES.

We have received the following circular from the Standards Office of the Board of Trade:—

"The following measures of length can be tested by the Standards Department:—

"Metal measures in the form of 'ribbands' or 'tapes':—100 links or 66 ft.; 50 links or 33 ft.; 100 ft.; 50 ft.; 25 ft.; 20 metres; 10 metres.

"The whole or total length only of each of the above measures will be tested, except in the case of a standard measure required for survey purposes, when the corrected values of each part or interval of the measure will be given—e.g., every 5 metres on 20 metres, every 10 ft. on 100 ft.

"Unless otherwise required, each measure will be tested under the following condition as to normal tension, 'pull,' or stretching-weight when the measure under test is supported throughout its whole length on a plane and even base:—

	Metal Measures.
100 link ribband	} 10 lb. avoird.
100 ft. to 50 ft.	
20 metres	} 5 kilograms.
10 metres	

"Linked chains, or round-wire chains composed of links and rings, and tapes made of linen or other fabric are only verified for certain official purposes.

"All results are reduced to 62° F. for links and feet; and to 0° C. for metres.

"The coefficient of linear expansion of a metal measure is taken to be as follows, unless otherwise stated:—

	For 1° F.	For 1° C.
Steel	0.00000689	0.00001240
Nickel-steel (35.7 nickel, 64.3 steel)	0.00000487	0.00000877

"Metal measures should have a brass disc ($\frac{1}{2}$ in. diameter) affixed upon which to place the official stamp.

"In certain cases Treasury fees are required, particulars of which can be obtained at the Standards Office. Fees are not payable on measures for Government Departments or for Local Authorities.

"A certificate of verification is given with each measure, in which its error or difference from standard is stated, and also, in some instances, the modulus of elasticity and 'sag' of a chain.

"On standard steel tapes for the use of local inspectors of weights and measures, an error on manufacture of 0.1 in. is allowed in excess or

deficiency. On other steel standards 0.25 in. is allowed; and on linen tapes 0.5 in. is permitted.

"Metric measures should be accurate to about 5 millimetres in 20 metres or to one four-thousandth of the whole length. The verification of measures can be carried out to nearly one-fourth-hundred-thousandth part of the whole length."

THE ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.

On Tuesday last Mr. D. M. Mackenzie read a paper on Westminster Abbey, illustrated by slides by Mr. S. B. Bolas. After explaining the plan, which showed the dates at which the various portions of the building were erected, Mr. Mackenzie described the interior of the building, including many of the multitudinous tombs and memorials, and the manner in which the building had been altered from time to time. Many of the slides, all of which were of splendid technical quality, possessed fine pictorial effects, notably those taken looking towards the transepts. Details of the triforium and of the tombs—especially that of Henry VII.—were shown, and were exactly the kind of photograph the architect always wishes, and usually fails, to procure.

A tour round the outside of the building followed, in which many fine slides of the buttresses were shown: Mr. Mackenzie remarking that the western towers were never completed, and that Wren had little to do with the final design, which was due to Hawksmoor, Wren wishing to complete them in the Gothic manner.

The meeting terminated with the announcement that in the recent photographic competition, inaugurated by the club to stimulate the study of architecture by photography, Mr. Alan Potter had been awarded the prize of three guineas for his set of photographs illustrating the treatment of apses in Italy.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Bethnal Green Borough Council 30,000*l.* for pipe sewer reconstruction works; Hackney Guardians, 5,800*l.* for erection of casual wards; Kensington Borough Council, 12,050*l.* for street improvement; Lambeth Borough Council, 7,786*l.* for jarrah wood paving works; Poplar Borough Council, 2,400*l.* for the purchase of a site for a depot; Stepney Borough Council, 23,900*l.* for electric light installation and meters; Stoke Newington Borough Council, 2,350*l.* for paving works; and Wandsworth Borough Council, 36,000*l.* for contributions to street improvements. Sanction to the borrowing by the Westminster City Council of 2,146*l.* for brick and pipe sewer works, and Kensington Borough Council of 7,600*l.* for street improvement, was given.

Chairman's Address.—The Chairman then delivered the annual address to the Council. Speaking of the Main Drainage Committee, he said:—

"First, then, the health of the citizen depends largely upon the magnificent system of main drainage, which has made Greater London's death rate one of the lowest, for large cities, in the Kingdom. It fell from 18.5 per 1,000 in 1899 to 14.5 in 1903. This may be some compensation for the rise in another rate of which we occasionally hear.

"During the year 1903, under the chairmanship of Mr. Goodman, nearly a hundred thousand million gallons of sewage were treated at the two outfall works, and this output exceeded that of 1902 by nearly ten thousand million gallons; so it is that new sewers are constantly needed and being constructed. Two such, costing three-quarters of a million, are in progress between Barking and Old Ford, and from Crossness to Deptford and Catford.

"So anxious was the Council to provide additional relief sewers and pumping-stations to carry away storm water that, in February last, it approved a scheme involving the expenditure of three-quarters of a million pounds for that purpose. The main drainage extension scheme and these flood relief works should do much to obviate these serious inundations. During the year the alarming suggestion was made that shell fish in the Thames estuary were contaminated by London sewage. It goes without saying that the Council would be most loth to damage either a great industry or a nourishing and popular food. But the special report of the Committee to the Council of February last shows that the suggestion was groundless. This conclusion, arrived at by bacterial examination, is fortified by the opinion of the Royal Commission on Sewage Disposal, which conducted an independent investigation."

In reference to some other Committees, the Chairman remarked that:—

"The Building Act Committee, presided over by

Captain Hemphill, are concerned under the Factory Act in preventing our factories becoming death traps in case of fire. In the course of the survey some 782 cases. In administering the Building Act they dealt with 2,251 applications, 2,000 complaints, and 3,638 danger structure cases. The Act however requires amendment, and suggestions have been received from the Metropolitan Borough Councils, from the various bodies, and from various Committees of the Council. Although the work is one of considerable magnitude and difficulty, the Committee hope to be in a position to submit amending proposals in the form of a Bill to be introduced into Parliament in the session of 1905.

"There are municipal heirlooms beside landed property, and I regard with much interest the work of the Historical Records, etc. Committee, presided over by Dolman was chairman. I venture to think we devote too little attention to the æsthetic side of London life, and too readily allow ancient landmarks and memories to be obliterated. Suitable tablets now indicate those houses in London which have been inhabited by distinguished Englishmen, and some historical buildings, of great interest to our city, have been saved from destruction. London, to its credit, was the first of the municipal authorities to obtain power to render this small service to future generations. The Horniman Museum is being made a most valuable educational institution—the first of a series of several museums which will awaken interest and impart information in a manner beyond the power of book-study.

"Not only is the citizen worker protected and catered for in the various ways which have passed under review, but some attempt has been made to improve the wages conditions of his fellow-workers. As an object lesson, showing what can be done under the best conditions extant, and for its protection and convenience, the Council still successfully keeps up the Works Department.

The Works Committee, presided over by Mr. Torrance, present figures which speak for themselves. The result of works completed during the year was reported to the Council shows, in the case of estimated works, a balance of cost below final certificate of 31,814*l.* 7*s.* 11*d.*, or 9.61 per cent., and in the case of jobbing works a balance of cost below schedule value of 547*l.* 10*s.* 11*d.* or 7.11 per cent. The Works Committee during the year executed work to the value of 416,295*l.* 16*s.* 6*d.* But apart from these satisfactory figures there is no doubt that this useful department has saved a considerable sum by the prevention of those prohibitive prices met with in our earlier years for that huge mass of work which still goes to contractors.

"With regard to the amount of work to be done, it must be remembered that we ourselves observe such regulations as we impose on contractors.

"Throughout the Council's service an endeavour has been made, without prejudicing the men, to give that thoughtful and sympathetic consideration to such questions as hours, wages, sick pay, holidays and uniforms, which binds together employer and employed. We cannot, of course, do all that is asked, but we have done much to make tolerable the position of these municipal servants."

The address was ordered to be printed.

Mr. T. J. Bailey, architect (Education).—The General Purposes Committee reported as follows, the recommendation being agreed to:—

"The Council, on July 26, 1904, resolved that Mr. T. J. Bailey should be continued as head of the architectural department (education), under the title of architect (education), and referred it to us to report as to the position which Mr. Bailey should hold in the Council's service. We have carefully considered the matter, and we think that, in view of the fact that the Council has decided to keep the architectural department (education) separate from the department under the superintending architect, it is desirable for the present that the chief officer of this department should rank as the head of a department. The circumstances are unusual, and we think it should be clearly understood that this decision relates only to the present holder of the office, and does not in any way prejudice any action which the Council may take in the future with reference to this position. We recommend that Mr. T. J. Bailey, during his term of service under the Council as architect (education), do rank as head of a department."

Long-grove Asylum.—The Asylums Committee reported as follows in regard to this building:—

"On March 24, 1903, the Council in accordance with section 239 of the Lunacy Act, 1890, authorised the Asylums Committee to proceed with the erection of a new asylum for 2,000 patients on the Horton estate, and on March 31, 1903, voted the sum of 97,210*l.* towards the cost of the provision of such asylum (the Long-grove asylum), viz., for the foundations, roads, the architects' and quantity surveyors' fees, additions to the central station for the supply of electric current and well sinking. On January 28, 1904, a further sum of 6,550*l.* was voted for the fencing of the estate, clerks' salaries and contingencies, making a total sum of 103,760*l.* The contract for putting in the foundations was let to Mr. Charles Wall, of Chelsea, on September 11, 1903, and the work has since proceeded with all dispatch. The foundations of the main building are now practically completed, and the contractor is putting in the foundations of certain of the detached buildings.

"The Council has no doubt, however, it is proposed to build a replica of the Heath and Horton asylums with such modifications as have by experience been found desirable. We have found the detached buildings for patients to be advantageous that we have increased the number to nine, against six at Horton. The designs of these villas have been most carefully considered, entailing visits to other asylums, and those we have decided on will, in our opinion, be an improvement on those at Horton asylum. The accommodation for patients in the main building has been correspondingly reduced. We have also decided to adopt the principle

of open corridors wherever possible. This we think, be safer in case of fire and ensure better ventilation, besides reducing the cost of the building. All the above have been approved by the Home Secretary.

"In accordance with the wishes of the Finance Committee we agreed that, before asking the Council to vote any further sum for the erection of the main building, an estimate should be submitted to them of the cost of erecting the superstructure upon a quantitative survey, and on June 28 the Council approved our proposals—viz., that we should have the estimate prepared by tenders for the work of the superstructure from selected contractors—the contract should be an omnibus contract and include the remaining building works, roads, etc., and a provision for the equipment of the farm and garden buildings and that the engineering works (electric lighting, laundry machinery, kitchen and bakery plants) should be the subject of later contracts. The Council further agreed that the contract should provide for a period of non-completion within the contract time, which will extend at two and a half years, and a bonus for early completion; also that a clause should be inserted in the contract giving facilities to the contractor to put a railway to the site, he to negotiate for any such wayleaves.

"We accordingly invited tenders from thirteen, but two of these firms returned the form of tender sent them, one objecting to the conditions of contract, the other stating that the work was more than could undertake at the present time. The remaining firms sent in tenders as follows:—

	AMOUNT
Foster and Dicksee (Rugby)	£359,091
C. Wall, Ltd. (London)	368,093
J. Carnichael (London)	371,111
Holloway Brothers (London) Ltd. (London)	371,200
(Subject to modification of form of contract)	
Holland and Hannen (London)	373,331
Holliday and Greenwood, Ltd. (London)	374,900
Patman and Fotheringham, Ltd. (London)	375,331
Leslie and Co., Ltd. (London)	379,093
H. J. Lovatt, Ltd. (Wolverhampton)	385,811
Mowlem and Co., Ltd. (London)	397,411
F. and H. F. Higgs (London)	401,000

"The priced bills of the lowest tenderers (J. Foster and Dicksee) have been examined by the quantity surveyors engaged by us, with the result that, with exception of clerical errors showing a sum of 600*l.* to be deducted from the amount of the tender, they are in order. We have therefore decided to recommend the Council to accept the tender of Messrs. Foster and Dicksee for the work. The amount of the quantity surveyors' estimate based upon a quantitative survey has been communicated to the Finance Committee, to whom we have submitted our revised estimate.

"It will be observed that the figure included in the estimate for 'foundations' has been reduced to 10,000*l.* This is the sum estimated by the architect as necessary to be deducted from the original estimate following the putting in of the foundations of the detached buildings (the sites of which had already been assigned) having to be transferred to the superstructure contract. This course has been rendered necessary in consequence of the local authority having decided to agree to the diversion of certain footpaths and roads, and under conditions we could not recommend the Council to accept. The amount of 10,000*l.* therefore now merged in the figure for the superstructure. We recommend (a) That the estimate (No. 423) of 408,353*l.*, submitted by the Finance Committee in completion of the erection of the superstructure of Long-grove asylum, Epsom, be approved; and the Asylums Committee be authorised to incur expenses exceeding that amount for this purpose, at the tender of Messrs. Foster and Dicksee, amounting to 359,892*l.* 10*s.*, for the erection of the superstructure of the Long-grove asylum including the putting in of the foundations of certain of the detached buildings, thereat be accepted, and that the solicitor do give and obtain the execution of a contract to give to the tenderer."

Mr. Dew moved, and Mr. Gosling seconded, an amendment that as the lowest tendered 21,953*l.* above the architect's estimate recommendation be referred back to the committee with a view to the work being carried out by the Works Committee without the intervention of a contractor.

Mr. Howell J. Williams said he thought the matter ought to be referred back for his consideration.

Mr. Torrance, Chairman of the Works Committee, said he was not in favour of the amendment.

Mr. E. White deprecated the commencing this large contract to a provincial firm when the building trade in London was in a state, more carpenters and joiners being out of work than there had been for years. The wages of skilled mechanics in Rugby was 8*d.* an hour, whereas in London it was from 10*d.* to 11*d.* If they were to contract out on that basis they would find that the difference in wages alone would account for the difference in the amount of the lowest tender.

Mr. Crooks, M.P., said there could be no doubt that if the contract was given to a Rugby firm the joinery work would be done better, and that was manifestly unfair to the London people. He supported the amendment that the matter should go back to the committee for further consideration, because he was convinced that by finding employment in London workmen they would be doing a good, and at the same time save money to the end.

After further discussion the Council divided:—
 For the amendment 40
 Against 68
 Majority against —28

The amendment was accordingly defeated, and the recommendation of the committee to the contract to Messrs. Foster and Co. was adopted.

Motor-Cars in Public Parks.—Mr. Sanders gave a reference to the Parks and Open Spaces Committee to consider and report as to amending the by-laws so as to prohibit the entrance of motor-cars under the Council's control of motor-cars which emit offensive odours.

Mr. Waterlow thought that the Council could hardly seriously consider the matter, as its practical working was almost impossible.

The motion was rejected, and the Council adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Line of Frontage and Projections.

Hampstead.—An iron and glass shelter at Belle Vue. (Mr. H. M. de Meza).—Consent.

Wandsworth.—Bringing forward of the site of "Garwood," "Wardleville," "Vroham," and "St. Leonard's," Rosendale, Horne-hill (Mr. P. C. Davies for Mr. Parry).—Consent.

Strand.—The retention of three wood and six showcases in front of No. 1, Piccadilly, St. James', Westminster (Mr. A. Olden).—Consent.

Wandsworth.—Buildings upon the site of Nos. 207, 209, and 215, Balham-high-road, Wandsworth (Mr. E. Schneider for Messrs. Wallis and F. J. Pettit).—Refused.

Hammersmith.—An addition in front of the Primitive Methodist Church and Schools, Hammersmith-road, Hammersmith (Messrs. David and Phillipson for the trustees of the church).—Refused.

Kensington, South.—One-story shops upon the site of the forecourts (Nos. 54 and 56, Church-street, Kensington (Mr. W. G. G. for Mr. C. Sale).—Refused.

Kensington, South.—One-story shops upon the site of the forecourts (Nos. 50 and 52, Church-street, Kensington (Mr. W. C. Hunt for Mr. F. Norton and Messrs. Weeden and Simpson).—Refused.

Width of Way.

Kensington, South.—A motor-car house at the site of No. 25, Brompton-square, Kensington, with external walls at less than the prescribed distance from the centre of the roadway of a street leading out of Cottage-place (Messrs. A. E. Curtis for Mr. J. Oswald).—Consent.

Hammersmith.—Two houses on the north side of Hammersmith-terrace, Hammersmith, with external walls and boundary fence at less than the prescribed distance from the centre of the roadway of Terrace-court (Mr. Marsh).—Consent.

St. George-in-the-East.—A playshed on the site of Globe-street, High-street, Wapping (Mr. T. J. Bailey for the Education Committee of the Council).—Consent.

Woolwich.—An iron and glass shelter at a ding on a site situated between Nos. 194 and 220, Plumstead-common-road, Plumstead (Mr. F. Bethell for the Royal Arsenal Corporation Society, Ltd.).—Consent.

Limehouse.—A warehouse upon the south side of Narrow-street, Limehouse (Mr. J. M. Wright for Mr. Hough).—Refused.

Width of Way and Line of Frontage.

Hammersmith.—An addition to St. Vincent's church, Queen-street, Hammersmith (Messrs. F. Tasker and Slater for Madame M. Bois).—Consent.

Width of Way and Construction.

Windsor, Central.—A wood and iron mission house on the south-eastern side of Exmouth-street, Clerkenwell (Messrs. Humphreys, Ltd., and the Rev. H. C. Frith).—Consent.

Space at Rear.

Marylebone, East.—A modification of the provisions of section 41 of the Act with regard to open spaces about buildings, so far as respects the erection of an addition to No. 1, Weymouth-street, St. Marylebone (Mr. W. Ridgway for Col. Matthey, C.B.).—Consent.

Formation of Streets.

Wandsworth.—That an order be issued to

Mr. J. S. Gabriel, sanctioning the formation or laying out of new streets for carriage traffic on the Fisher estate, between Leigham-court-road and Velely-road, Streatham.—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—The members of the Northern Architectural Association visited the new council schools, North Heaton, and St. Gabriel's Church, Heaton-road recently. The new school cost about 11l. per head. Mr. S. D. Robins, the architect, conducted the party over the building, and was cordially thanked, on the motion of Mr. Clark (Darlington), seconded by Mr. Brown (Sunderland). At St. Gabriel's Church the members were received by the vicar (Rev. Robert Trotter) and the contractor (Mr. Baston). Hitherto the church has consisted of the nave and south aisle. There is at present being added a north aisle and transept, part of a tower, with an organ chamber, and the chancel. This extension will, it is expected, be completed by the middle of next year, leaving only the south transept, vestries, morning chapel, and baptistry to complete the building. Lord Armstrong is building the tower, or a portion of it. When completed the tower will be 116 ft. high. The seating accommodation up to the present has been 500. The present scheme of extension will provide for 300 additional worshippers, and when the church is fully completed the accommodation will be furnished for 1,000. The architect of the church is Mr. F. W. Rich.

Correspondence.

THE LIABILITY OF COUNCILS FOR SANITARY INSPECTORS' ERRORS.

SIR,—The decision of Judge Addison, K.C., in the case of Johnson v. Bermoidsey Borough Council, if legally sound, seems illogical and unfair. A principal should surely be bound by the act of a recognised agent, where loss is caused to another.

The Council gave the plaintiff notice to open ground and reconstruct a drain under a house. Examination showed there was no drain there, but one existed next door. The mistake arose through renumbering of the houses. Plaintiff sought to recover the cost of examination.

The judge held that sanitary inspectors were, by law, the judge of whether drains required relaying or repairing, and if they, by reason of a defective nose or any other cause, made a *bona-fide* mistake, the Borough Council could not be held liable, and gave judgment for the defendant Council, without costs.

In this case it was not a question of judgment as to the need of repair as no drain existed. The order involved the owner unfairly in certain expenses, and its service in error constituted a depreciation of the property in the eyes of a prospective buyer, and, in fact, was more detrimental than a statement by an individual that the drainage of the house was defective, which would be tantamount to a libel, and actionable.

I should like to see the matter carried further, and to know if there is any precedent for the judgment.

E. W. HUDSON, F.S.I.

TECHNICIANS' ENGLISH.

SIR,—In the current issue of the *Builder* a reviewer of a book takes very proper exception to the composition of the author. My object in writing is not to defend that gentleman's English, but to point out that such dictation is not at all uncommon among technicians. In the course of my business, I have had to prepare a great number of papers for publication, and I find that many people who consider themselves capable of writing them have a very vague idea of the structure of sentences. The result is a most involved production. The process of making it clear is something like this:—I get a leaf of foolscap covered with words. I start at the top with a sentence, and possibly go down two-thirds of the leaf before I come to a full stop. What it all means it is impossible to say. The first thing to be done is to try to get at the subject, and then at the predicate, marking off interposed clauses by commas or parenthesis. The result is generally the production of three or four short sentences for the original rignarole which was not understandable. When the author sees his paper in print, he thinks what a clever fellow he

is, or what wonderful people composers and "readers" are to express so well what he intended! But "*palum qui meruit ferat.*"

A SUB-EDITOR.

[*] We fear our experience is that many architects, as well as technicians, have most vague ideas as to the structure of sentences or the use of punctuation; and if we had made a list of all the wrongly-spelt words we have met with in communications from architects, it would be a formidable and distressing one. By the same post that brought the above letter we received a communication from an architect asking us to take a certain course "in the interests of the profession." It may be said that such mistakes are of little practical consequence, but they imply a regrettable deficiency in general culture.—ED.]

ERRORS IN QUANTITIES.

SIR,—Being the surveyor who prepared the case for the plaintiffs in the case of Patman and Fotheringham v. Pilditch, I trust you will pardon me for troubling you with the following remarks, as I believe a wrong impression exists as to the complete decision in this case. In your issue of July 16, p. 72, you report Patman and Fotheringham v. Pilditch; you say "The point decided is one of importance to building owners and contractors; we think it well to put on record the judgment of Mr. Justice Channell, which was as follows." The report of the judgment you then give is correct as far as it goes; but, unfortunately, you do not seem to have been in possession of the whole of Mr. Justice Channell's judgment, the concluding portion of which is very important, as it implies that the "total omission" of an item from the bills of quantities is "not an error," and would not have to be paid for as such (the case which he quotes being of that nature). You will note, also, that Mr. Justice Channell's words are:—"But I should have to deal specially with cases of things that everybody must understand are to be done, but which happen to be omitted in the quantities."

I enclose a copy of the concluding portion of the official transcript of the shorthand notes required to complete your report.

This modification of the judgment is worthy of note by contractors, and has a most important bearing on Clause 12A of the Schedule of Conditions of Building Contract sanctioned by the Institute of Architects in agreement with the Institute of Builders and the National Federation of Master Builders, since, to make this clause effectual, it should now read:—"Should any error appear in, or omission be made from, the bills of quantities," etc.

WALTER LAWRENCE.

COMPETITIONS.

CHURCH, NEW SOMERBY, GRANTHAM.—Mr. G. H. Fellowes Prynn has been appointed the assessor in this competition. One hundred and three sets of plans have been sent in.

VILLAS FOR THE COEDSAESON BUILDING CLUB.—We are asked to state that the result of the competition for these will not be known till November 2.

COWEN MEMORIAL, NEWCASTLE.—In connexion with the competition held recently for the purpose of obtaining designs for a monument to be erected in memory of Joseph Cowen, the model of Mr. John Tweed, of London, has been placed first. Mr. T. Eyre Macklin, Newcastle, has been awarded the second premium of 50l., and the third of 30l. has gone to Mr. Kellock Brown, of Glasgow.


NEW LEWISHAM LIBRARY.—The plans selected by the Lewisham Borough Council for the new library to be erected at Brockley at a cost of 4,500l. are those of Mr. A. L. Guy, A.R.I.B.A., of Lewisham Park.

A MEMORIAL TO HALLEY.—A marble bust of Edmund Halley, the astronomer, executed by Mr. Henry Pegram, A.R.A., has been placed in the Borough of Shoreditch Library at Haggerston. Halley was born at Haggerston on October 26, 1656; his father, a member of an old Derbyshire family, was a wealthy trader having a soap manufactory in Winchester-street, in the City of London.

CHEAP COTTAGES FOR LABOURERS.—The Chertsey Rural District Council on the 11th inst. discussed a recommendation of their medical officer that the building by-laws should be so altered as to permit of the erection of cottages, in the rural district, of wood and corrugated iron, for letting to labourers at cheap rents. The recent action of Mr. Justice Grantam was eulogised, and the Council unanimously appointed a committee of farmers to consider the by-laws with a view to their early alteration.

Illustrations.

SAN LORENZO, VERONA.

 THE view of the interior of this church is given in connexion with, and in illustration of, the first article in the present issue, to which the reader is referred.

NEW HÔTEL DE VILLE, SENS.

THE illustration of the new Hôtel de Ville at Sens is reproduced from the architects' elevation drawing.

The building was formally opened in April last. It is the result of a competition held in January 1901, in which the present design, by MM. Dupont and Poivert, was selected.

Owing to the practice prevailing in France of not drawing a scale on the paper, but only giving a note of it, the memorandum "Echelle 0.02" in the corner of the illustration is of course incorrect now that the drawing (a very large one) is reduced to the size of our page; but there are a good many figured measurements which will to some extent supply the place of a scale. The height of the campanile is 190 ft.

The exterior sculpture is executed by

members of the Société des Sculpteurs; the interior sculpture is by MM. Dufeu, Jacquier, and Bersin. The decorative paintings on the ceilings were executed by M. Cavallé-Col, the mural panels by M. Maugonot, and a historical painting by M. Scherrer.

The building is founded on concrete piles 23 ft. deep. The plinth is of Roche de Comblanchien stone; the main portion of the façade of Charentenay stone; the balustrades of Larrys stone. The campanile is of iron as far as the balcony, and of timber above that point. The roofs are of timber, and the floors of steel. The decoration of the main staircase is in stucco. The steps are of Comblanchien stone on steel framing.

We give also a sheet showing the decorative treatment of two of the ceilings, also reproduced from the architects' drawing.

We fear we cannot expect English architects, as a rule, to admire this work, which is in a style very contrary to the taste and feeling prevailing in this country at present. But it is of interest as illustrating an important new French building, and as showing the type of work which is in favour in France at present, since it obtained the first place in a competition.

The plan, traced from the architects' drawing, is a very good one, and perhaps for a good deal in the selection. The plan of the circular "Salon d'Honneur," adjoining the vestibule both to the Salle des Fêtes, and the Salle des Mariages, and placed at the angle of the building, is a good point.

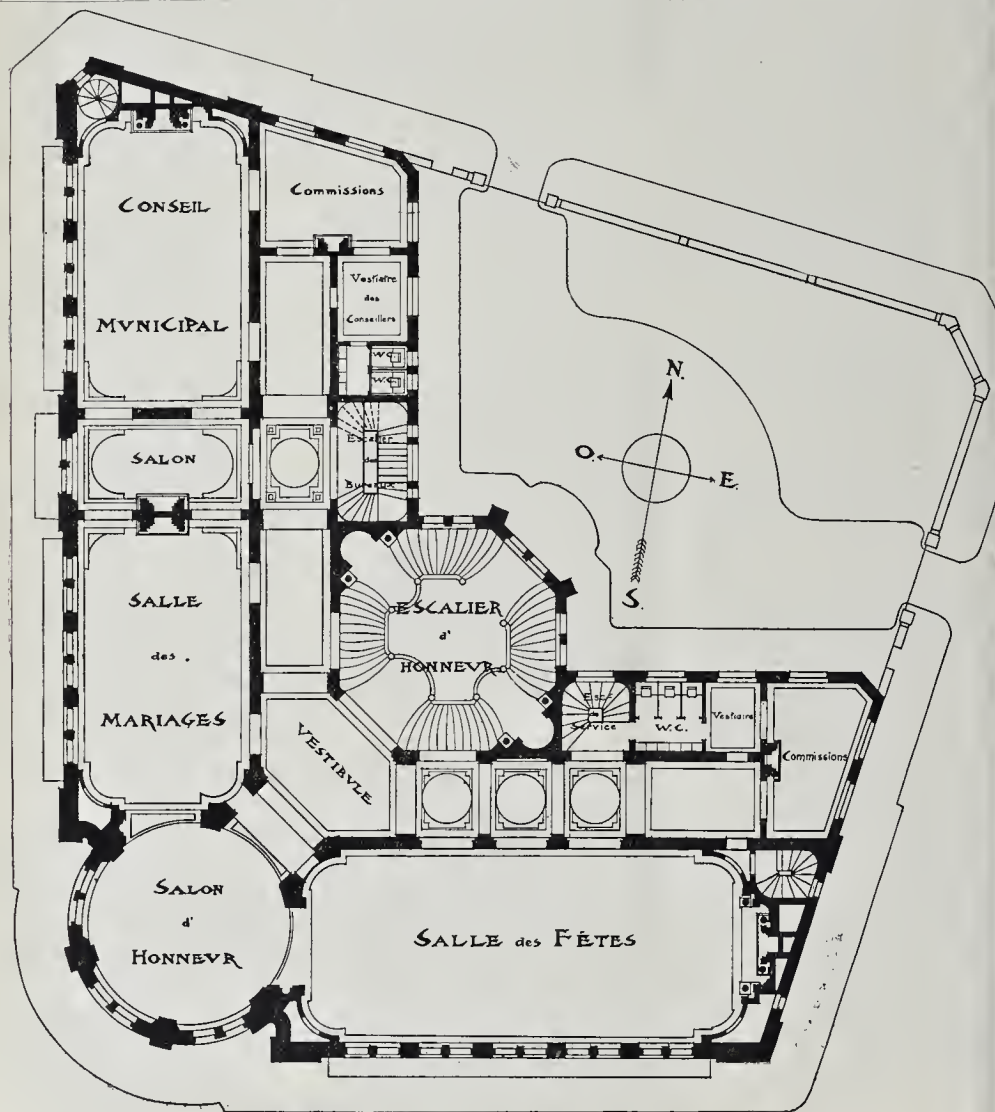
We are much indebted to MM. Dupont and Poivert for their kindness in lending their drawings. As a general rule it is exceedingly difficult to induce architects on the Continent to send drawings to England; so their courtesy in this case is all the more appreciated.

THE WHITE HOUSE, HELENSBURGH.

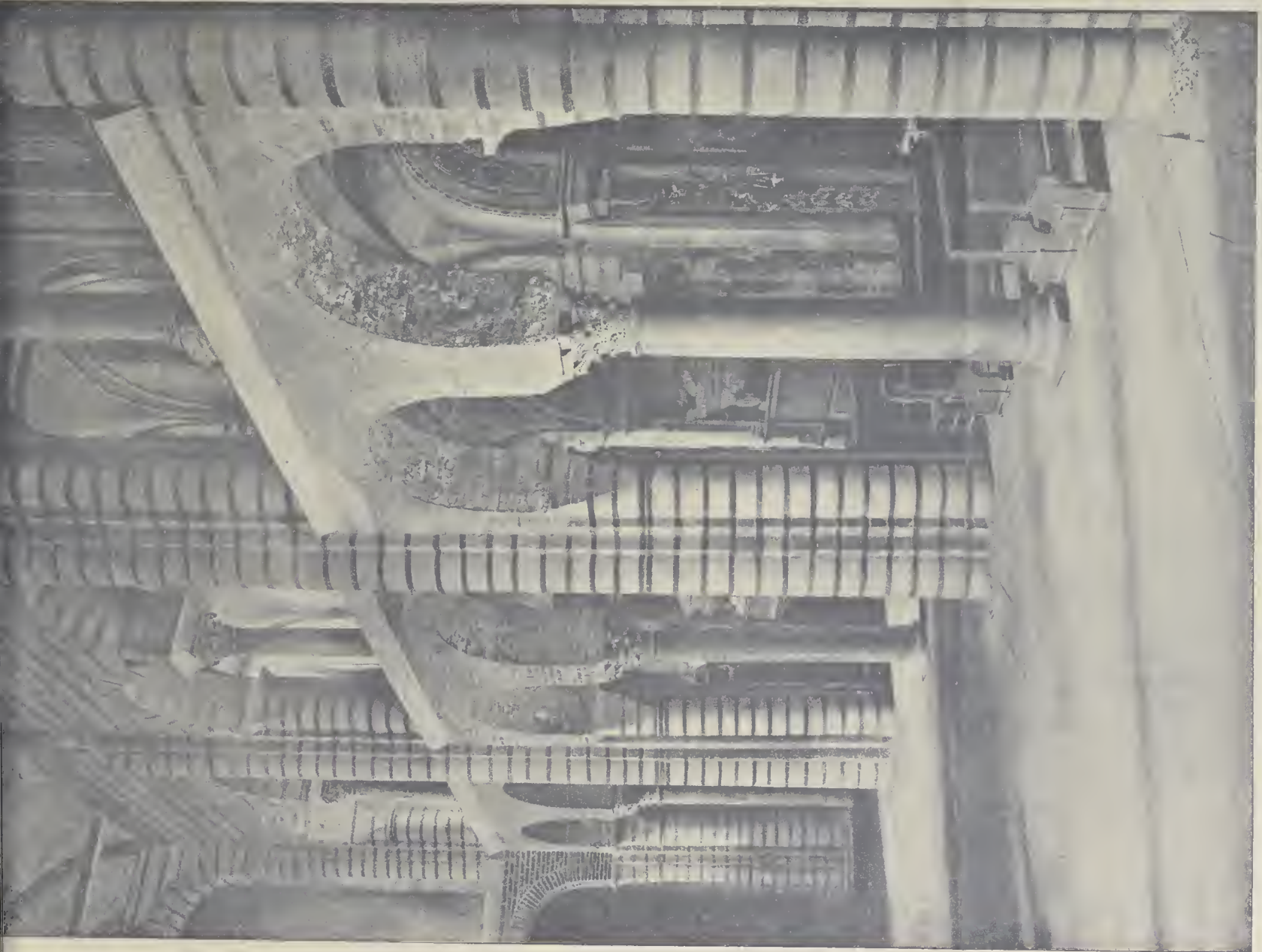
THE illustrations represent the exterior and interior of a house on the Clyde.

The exterior is finished with white cast, the window mullions being of grey, and the roof of red tiles. In the hall the work is in pine stained a dark bronze, with a red-brick arch to the fireplace, and a copper hood. The upper part of the hall is decorated, the prevailing colours being green, and grey.

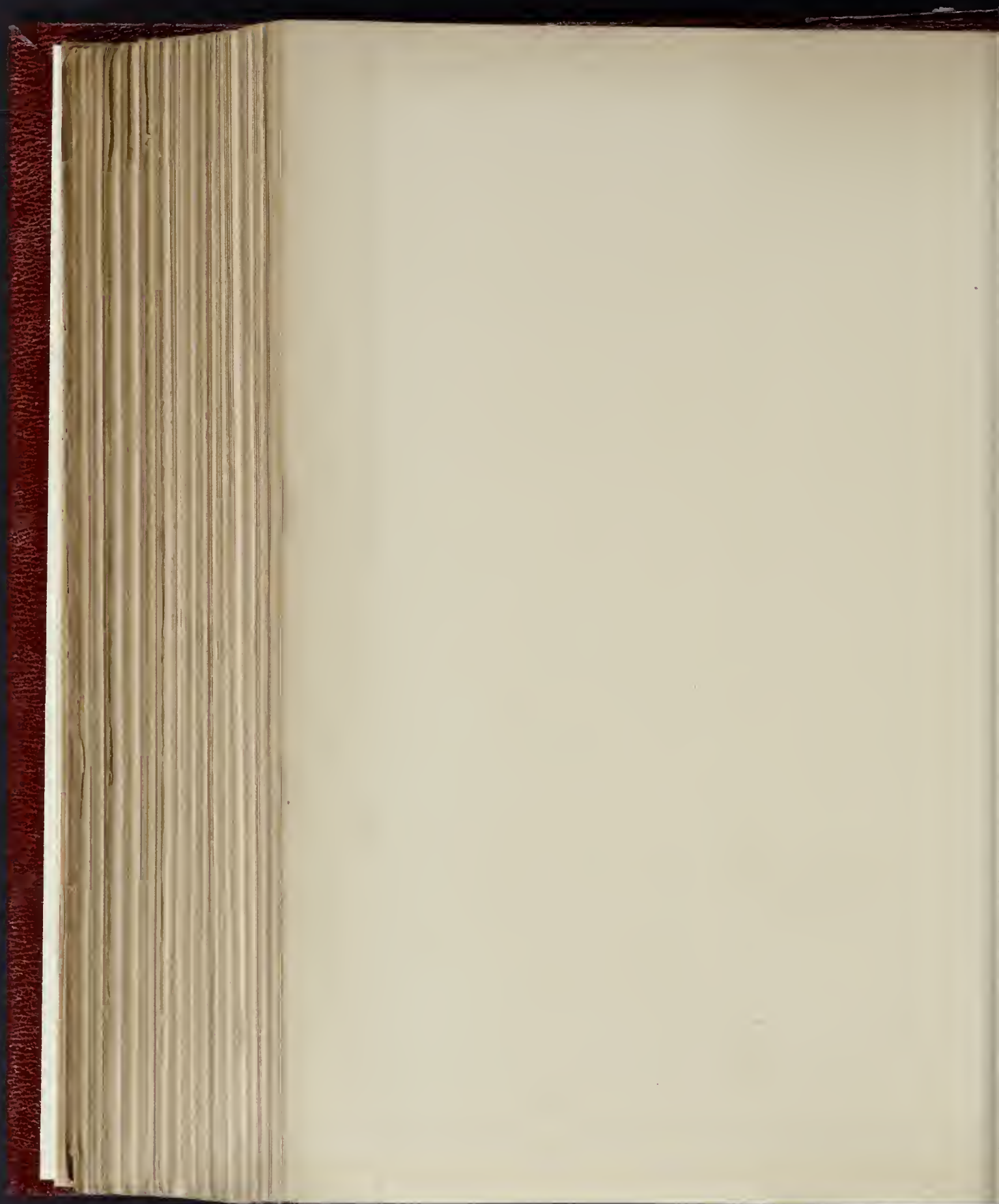
Mr. M. H. Baillie Scott is the architect.



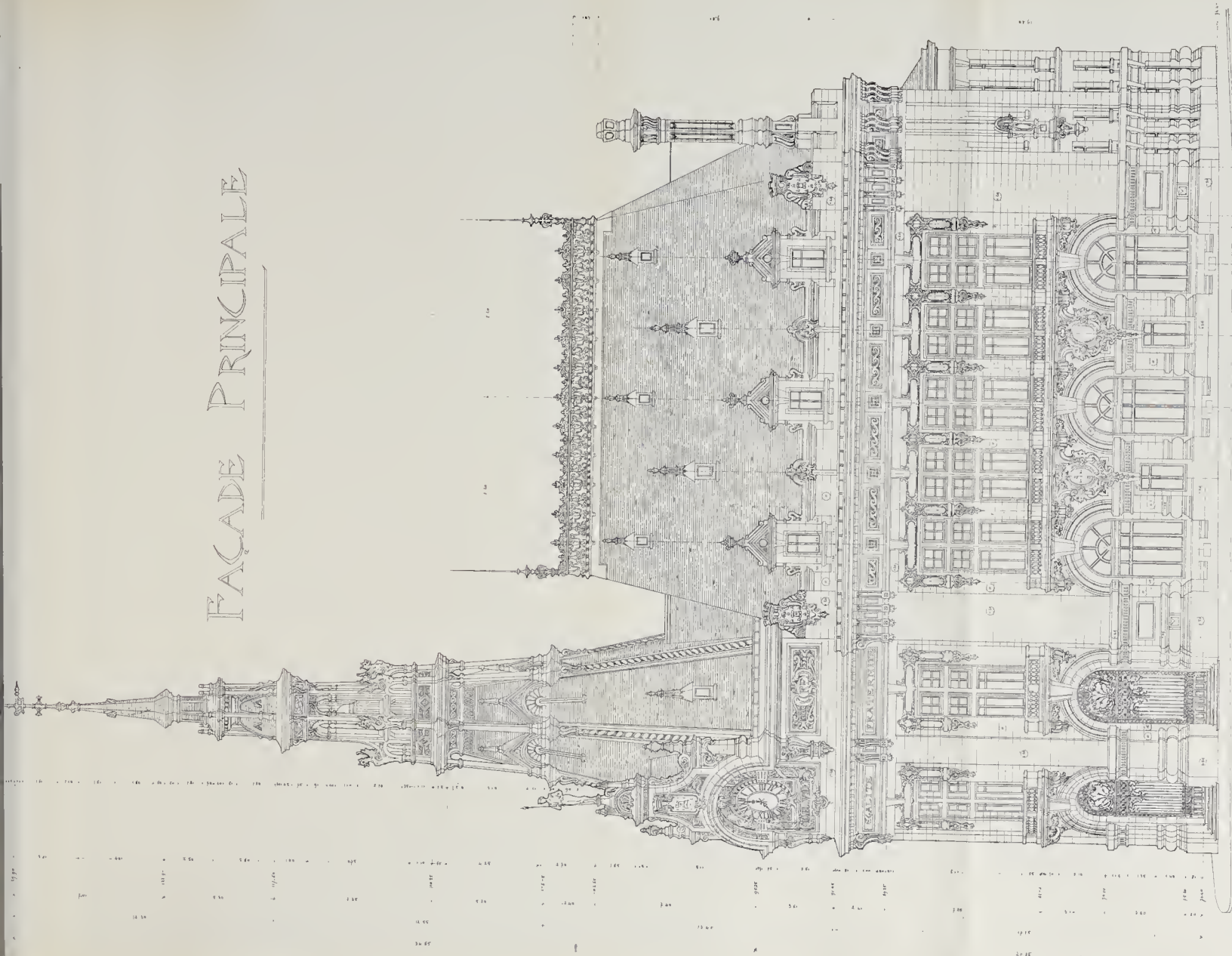
New Hôtel de Ville, Sens. Plan.



INTERIOR, SAN LORENZO, VERONA



FAÇADE PRINCIPALE



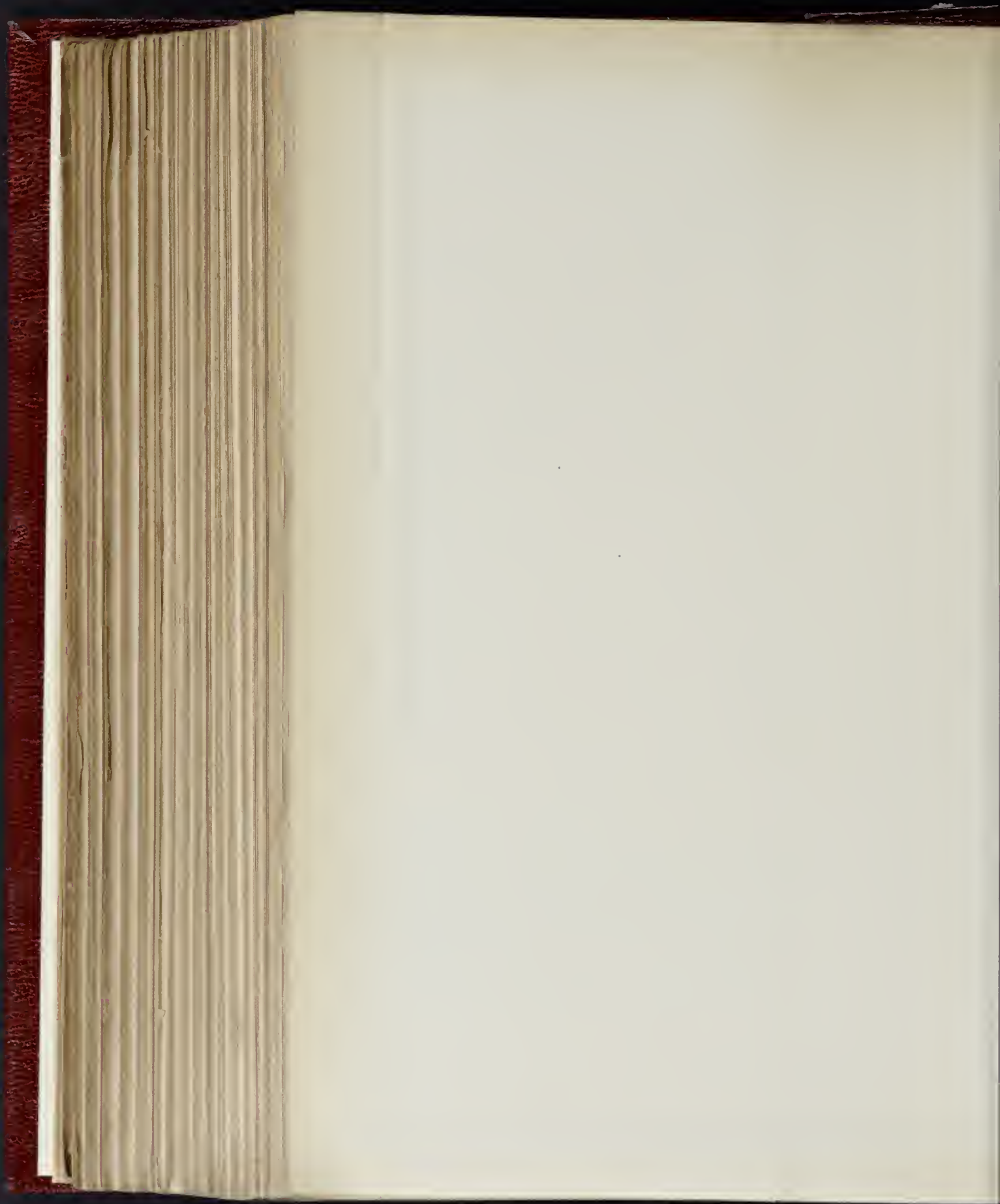
Echelle 0,02 p.m.

Dessiné à Paris par les Architectes
Sousignés

Auguste Perret
Paul Boiteux

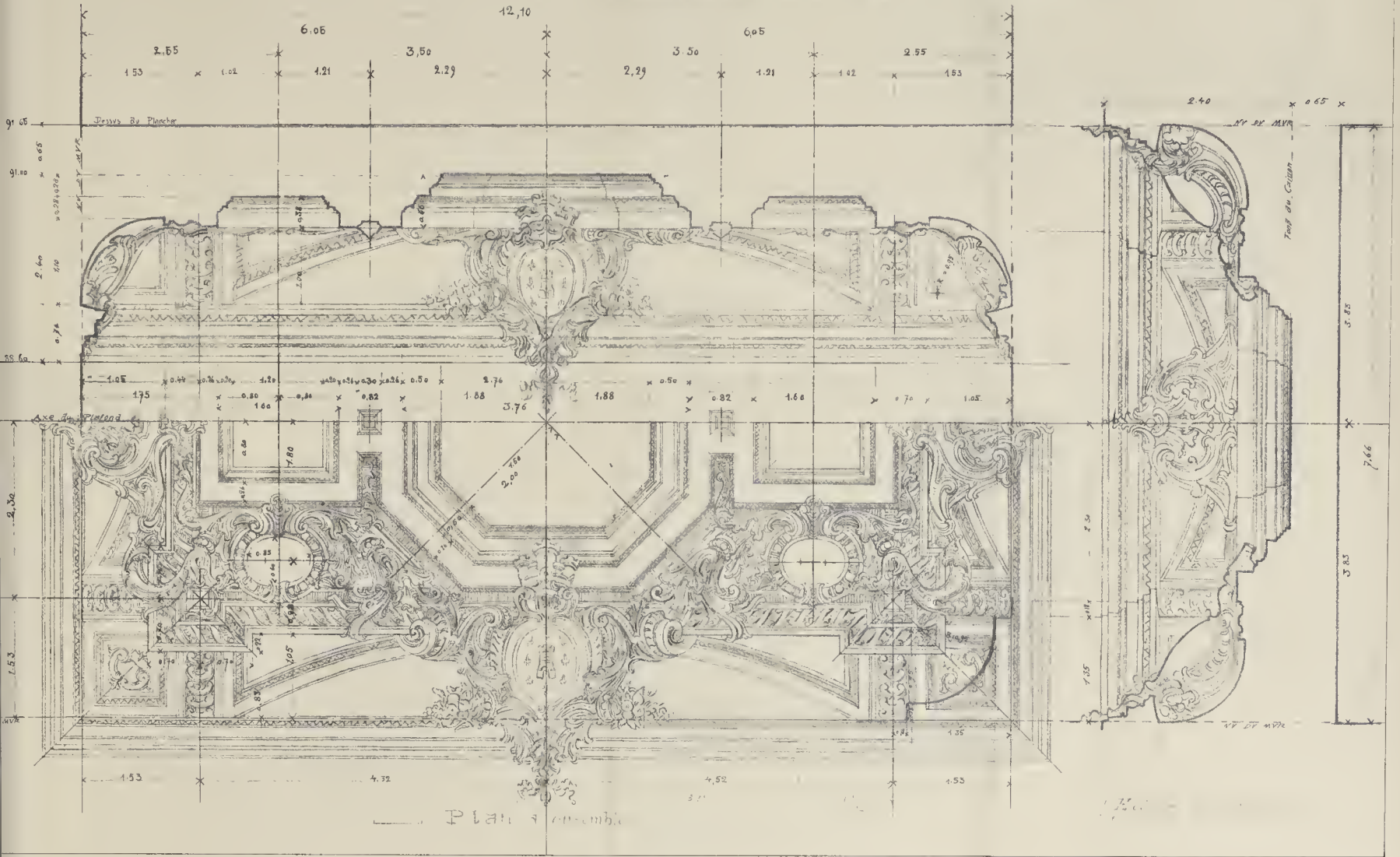
PHOTO LITHO SPAQUE & C^o 43, RUE DE LA HARPE, PARIS

NEW HOTEL DE VILLE, SENS, FRANCE.—MM. DUJONT AND FOIVERT, ARCHITECTS.



HÔTEL DE VILLE DE SENS

Salle du Conseil municipal et Salle des Mariages - PLAFOND







THE PHOTOGRAPH BY MR. J. A. B. T. EASTMAN, 111 N. 5TH STREET, NEW YORK, N. Y.

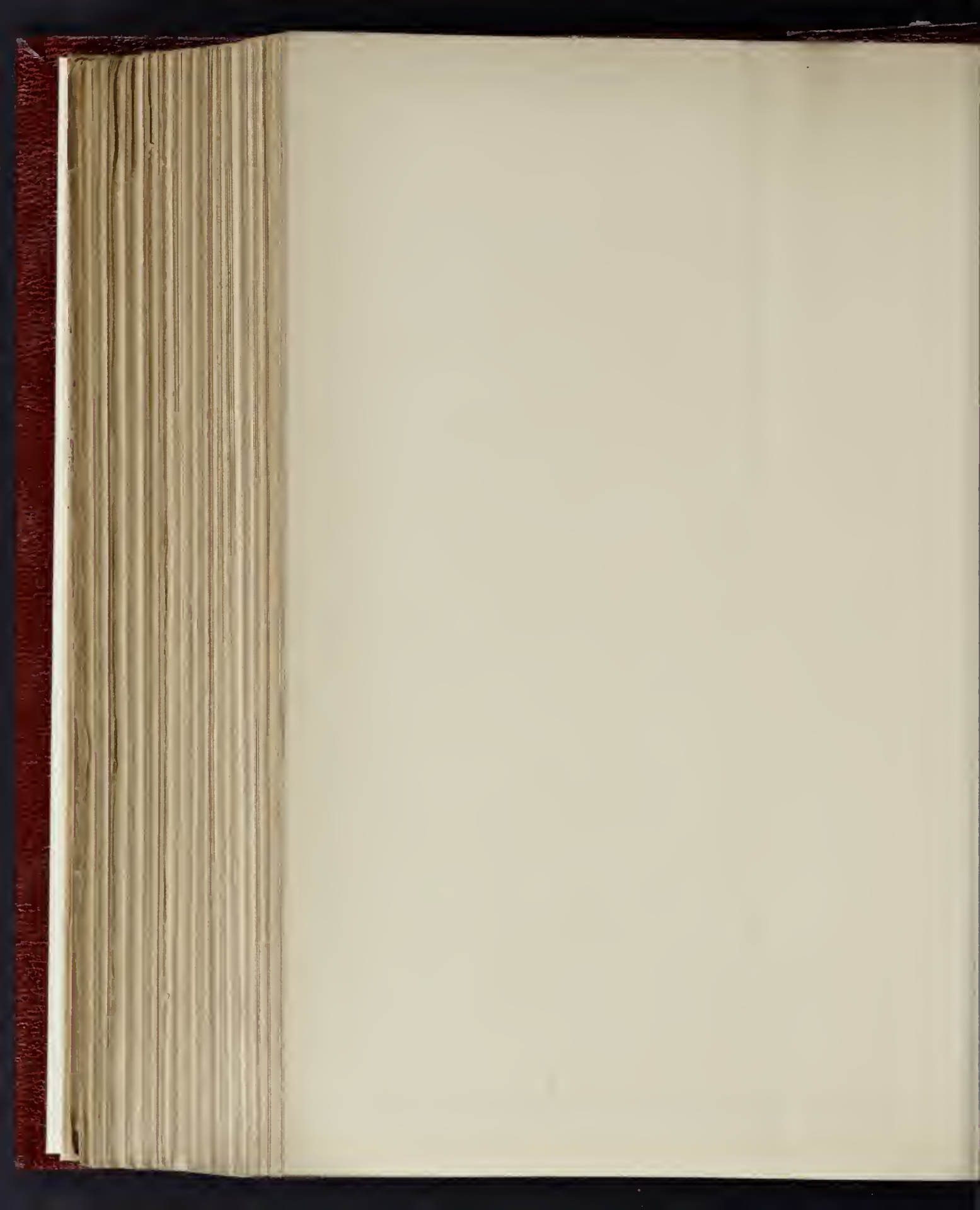
THE WHITE HOUSE, HELENSBURGH—MR. M. H. BAILLIE SCOTT, ARCHITECT.
(SEE COLUMN OPPOSITE.)

THE BUILDER, OCTOBER 15, 1904.



THE PHOTOGRAPH BY MR. J. A. B. T. EASTMAN, 111 N. 5TH STREET, NEW YORK, N. Y.

THE WHITE HOUSE, HELENSBURGH—MR. M. H. BAILLIE SCOTT, ARCHITECT.
THE HALL.



BOOKS RECEIVED.

AMERICAN RENAISSANCE. By J. Wheeler W. architect. (New York: W. T. Cornstock.)
 PRACTICAL MASONRY. By W. R. Purchase. 8 editions. (Crosby Lockwood and Son.)
 THE ARCHITECTS' AND BUILDERS' POCKET-BOOK. By Frank E. Kidder, C.E. (Chapman Hall.)
 HARD WOODS: ENGLISH AND FOREIGN. Percy A. Wells. (Percival Marshall and Co.)
 COURSES FOR THE WORKING CLASSES. By Percy White Cranfield, A.R.I.B.A., and Henry Le Potter, A.R.I.B.A. Second edition. T. Batsford, 21s.
 SMOKE PREVENTION AND FUEL ECONOMY. W. H. Booth and John B. Kershaw. (Chald Constable, 6s.)
 RESIDUE ASTRONOMY. By D. W. Hornor. (Berthly and Co., 1s. 6d.)
 BESSELDRUF UND SEINE BAUTEN. (Architectural Vereinigungverein zu Düsseldorf, marks.)
 MEDITERRANEAN WINTER RESORTS. By Isaac A. Reynolds-Ball, F.R.G.S. (Hazzell, Son, and Viney, 6s.)
 THE VENERABLE BEBE: His Life and Work. Canon Rawnsley. (Hills and Co., Sunderland.)

The Student's Column.

NOTES ON PORTLAND CEMENT.
 CHAPTER XI.—SPECIFICATIONS.

VERY common error made by the writer of a specification is to pick out the most important clauses in other specifications and incorporate them in his own. This particularly is the case in Portland cement, the properties of which so little understood by users generally. The specification thus drawn up is often impossible to work to. Some users of cement still hold to the old idea that a heavy weight per bushel denotes a good, well-burned cement. At the same time they recognise the fact that the finer a cement is ground the greater cementitious value; so they specify a weight about 112 lb. per bushel, together with grinding, being ignorant of the fact that the finer a cement is ground the less will its weight be, the weight decreasing in direct ratio to the fineness.

It is common to find that a cement leaving residue on a 50 by 50 mesh sieve is specified, while as much as 12 per cent. residue is allowed a 76 by 76 mesh sieve.

With the present methods of grinding cement, to obtain a product which will pass through a 50 by 50 mesh sieve, the residue on the 76 by 76 would require to be about 3 per cent.

This, of course, means that the manufacturer desires to grind the cement much finer than is specified, a costly operation for which the consumer does not care to pay, although the value of the cement is greatly increased. Omission usually made in specifying fineness is that no particular size of wire for the sieve is given. This is more the want of uniform methods of testing, England having adopted no standard methods for cement-testing as other countries have done. It would insure the user supplied with better ground cement if specified the fineness on some of the finer sieves, such as 100 by 100 mesh.

It is frequently specified that a certain amount of water shall be used for gauging test pieces, and the quantity required varies with almost every sample. A manufacturer might supply a cement much finer ground than asked for in a specification (an advantage to the consumer) which could not be gauged with the amount of water specified, but which, if ground to the fineness specified, could easily be gauged with this amount of water. A writer of a specification, who must have read that cement requires about 12 per cent. of water to form necessary compounds of hydration, inserted a quantity in his specification. It would be quite impossible to gauge any "neat" cement with this amount of water, as a considerable excess is always required over the quantity actually absorbed in the hydration of the cement compounds.

Another great mistake made in specifications, is one which causes considerable friction between the manufacturer and user, is specifying laboratory tests and carrying them out under practical working conditions,

For instance, a high tensile strength may be asked for which can only be obtained by careful manipulation, but the user expects to get this strength by mixing the cement as he would do in practical working and putting the paste in the moulds with no particular care, often introducing internal strains in the mass which will cause the briquettes to break with a very light load. In the majority of complaints investigated by the author it has been his experience to find that the laboratory tests specified have been done by a labourer or unskilled operator who knows absolutely nothing of the properties of the material which he is testing.

As showing the necessity for care in drawing up cement specifications and testing, reference might be made to the German standard rules, than which there is none better, as drawn up by the Association of Cement Manufacturers.

Time of Set.—In order to ascertain the time of set, take a sample of "neat" cement and mix for three minutes with water to a stiff paste; for quick-setting cements only one minute is required. The mixture is then spread on a glass plate at a single operation, in the form of a pat 1.5 c.m. thick and tapering towards the edges. The consistency of the gauged cement should be such that a few taps on the glass plate will cause the mass, which was placed thereon by a spatula, to flow outwards towards the edges. From 27 to 30 per cent. of water is generally sufficient for this purpose. When the pats become hard enough to withstand a slight pressure with the finger nail, the cement may be considered as set.

To ascertain accurately the exact time of set, and to determine the commencement of setting (the initial set), which is of the greatest importance with quick-setting cement, as it must not be worked after it begins to set, a standard needle of 300 grammes weight is used with a diameter of 1 millimetre and a flat point. A metal mould 4 c.m. in height and 8 c.m. inside diameter is placed upon a glass plate and filled with gauged cement of the above consistency, and tested at intervals with the needle. The moment when the needle fails to penetrate the entire depth of the mass is considered as the commencement of setting. The time which elapses between the gauging and the moment at which the needle leaves no visible impression on the surface of the pat is the time taken to set. In order to obtain uniform results in determining the setting of cement, it is of importance to carry out the test at a mean temperature of both air and water of 15° to 18° C., as the setting is influenced by the temperature of the air and of the water used in gauging, a high temperature quickens the setting, a low temperature, on the other hand, retards it.

Slow-setting cements should not materially increase in temperature during setting, whereas with quick-setting cements a marked increase is permissible. Cement is rendered slower setting by long storage, and its tensile strength is increased if kept in a dry place free from draughts of moist air. The opinion frequently prevailing that cement deteriorates by long warehousing is, therefore, an erroneous one, and contract clauses which specify the use of fresh cement only should be discarded.

Soundness.—Portland cement should be constant in volume. The decisive test of this property should be that a pat of "neat" cement made on a glass plate and kept in a damp atmosphere for twenty-four hours, and afterwards immersed in water, must not show any signs of warping or cracking at the edges, even after the lapse of a considerable period.

In carrying out this test the pat prepared for determining the time of set should be placed under water at the end of twenty-four hours in the case of slow-setting cements, but in any case only after it has become set. This may be done much sooner in the case of quick-setting cements. The pats, especially of slow-setting cements, must be well protected from draughts and the direct rays of the sun until after they have become set. The best method is to place them in a closed box, or cover them with damp cloths. Hair-cracks which are caused by shrinkage due to rapid drying will thus be avoided. These generally appear in the centre of the pat, and are often mistaken by the uninitiated for cracks caused by "blowing." If the cement shows any crumbling, or cracks are visible during the process of hardening while under water, this is a certain indication of the "blowing" of the cement. That is to say, the cement becomes cracked in consequence of an increase of volume, and a

gradual disruption of the particles previously connected takes place, which may ultimately lead to the total destruction of the mass. These symptoms of expansion usually appear within three days, but an observation extending over twenty-eight days is always sufficient.

Fineness of Grinding.—Portland cement must be ground so fine that not more than 10 per cent. of residue is left after a sample has been passed through a wire sieve of 900 meshes to the sq. c.m. The thickness of the wire of the sieve should be equal to half the width of the opening of the mesh.

To carry out the test, 100 grammes of the cement must be used for each determination.

The fineness of grinding of cement is of paramount importance, because as sand is nearly always used with it, and sometimes in large proportions, the cohesive strength of the mortar is greater in proportion to the fineness of the cement, inasmuch as under those conditions more particles of the cement come into action. It would, therefore, seem advisable that the fineness of the powder should be uniformly tested by the use of a fine sieve of above-mentioned description. It would, however, be erroneous to judge of the quality of the cement by its fineness only, as inferior underburned cements are more frequently found to be finely ground than good hard-burned ones. The latter kind, though coarser, will generally show a higher cementitious value than the former. When cement is used mixed with lime it is advisable to employ hard-burned and extremely finely-ground cement; the cost of production is higher, but will be counterbalanced by a materially improved quality of mortar.

Tests for Strength.—The cementitious value of Portland cement should be determined by testing a mixture of cement and sand.

The testing shall be carried out in a uniform manner, both as to its tensile strength and resistance to crushing. The test blocks shall be of uniform shape and section, and the same apparatus used in every case. It is advisable at the same time to ascertain the strength of the neat cement. The tests for tensile strength should be carried out by briquettes having a sectional area of 5 sq. c.m. at the point of fracture. In the crushing test cubes should be used having sides of 50 sq. c.m. in area. Slow-setting cement, when tested with three parts by weight of standard sand to one part by weight of cement, must attain after twenty-eight days (that is to say, one day in air and twenty-seven days in water) a tensile strength of at least 16 kilos. per sq. c.m. The crushing strength must be at least 160 kilos. per sq. c.m.

With quick-setting cements, the tensile strength at twenty-eight days is generally less than that above mentioned. The time of set should therefore be stated when specifying the strength required.

It is absolutely necessary to use a large proportion of sand in testing, especially when comparing several cements, as the power of cementing sand together varies with different cements, and in practice this is the most important feature. The most suitable proportion for this purpose is held to be three parts by weight of sand to one part of cement, since with that proportion the cementitious value of various kinds of cement becomes sufficiently developed.

Cement showing a greater relative tensile strength than crushing strength often admits of the addition of a larger proportion of sand, and in consideration of this property, as well as for its greater strength with the usual amount of sand, should command a higher price.

The standard test of strength, is the crushing test at twenty-eight days, it being impossible to accurately determine the cementing power when comparing different kinds of cement in a shorter period of time. Thus, for instance, the strength of various samples of cement may be alike after twenty-eight days, whereas there may be a material difference between them after only seven days.

The tensile test at twenty-eight days serves as a controlling test of cement delivered. If, however, a decision is to be arrived at after seven days it may be made with a given sample, after the ratio of tensile strength between the seven days and twenty-eight days has been determined.

This preliminary test may also be carried out with "neat" cement after having ascertained the relation between the strength of the "neat" cement at twenty-eight days and that mixed with three parts of sand.

It would be of special value in cases where

circumstances will admit, to further extend the hardening period of the test blocks, in order to ascertain the behaviour of different kinds of cements at long dates.

To arrive at consistent results, sand of the same size of grain and of the same kind should always be used. This normal sand is obtained by washing pure quartz sand as clean as possible, drying it and passing it through a sieve of 60 holes per sq. c.m. in order to remove the coarser particles; the sand thus obtained is again passed through a sieve of 120 holes per sq. c.m. to free it from the finer particles. The thickness of the wire of the sieves should be 0.38 and 0.32 c.m. respectively. Since all quartz sands do not always give the same results when similarly treated it should be ascertained whether the normal sand employed will give results consistent with the normal sand supplied for testing purposes under the direction of the Committee of the Association of Cement Manufacturers, and which is used at the Royal Testing Station of Charlottenburg.

As in testing the same cement, a great deal depends on consistent results being obtained at different places, the subjoined rules should be strictly adhered to. In order to secure accurate results at least ten tests should be made at each date.

Tensile Tests.—The briquettes can be made either by hand or by machine.

Hand Made.

On a metal or thick glass plate, forming a base for the briquettes, place five small sheets of filter paper dipped in water, and on each sheet a mould dipped in water. Weigh off 250 grammes cement and 750 grammes dry normal sand, mixing both well together in a vessel. Add 100 ccs. of pure fresh water, working the whole mass well together for five minutes. With the mortar thus produced fill the moulds at one operation and heaped up in the centre; by means of an iron spatula, having a surface of 8 c.m. by 5 c.m. and 35 c.m. long, and weighing about 250 grammes, beat down the projecting mortar, first gently on the sides, then harder and harder till it becomes plastic and water appears on the surface. A continued beating of about one minute per mould is absolutely necessary to attain this object. Adding mortar to that already in the mould is not advisable, as briquettes of the same cement made at different testing stations should be of equal density throughout. Scrape off with a knife any mortar projecting above the top of the mould, smoothing the face with the same instrument; loose the mould carefully from the briquette and place the latter in a covered box lined with zinc, to avoid unequal drying owing to variations of temperature. Twenty-four hours after making the briquettes they should be placed under water, in which they must remain quite submerged during the whole period of hardening.

Machine Made.

After the mould, fitted with the filling-box, has been screwed on to the bedplate by two adjusting screws, 180 grammes of the mortar, made as just explained, are placed into the mould for each briquette and the iron core put in; 150 strokes are then given to the core by Böhme's hammer apparatus, with the hammer weighing 2 kilos.

By strictly observing the above instruction hand and machine tests give fairly uniform results. In disputed cases, however, machine-made blocks are considered the standard.

"Neat" Tests.—Rub the inside of the moulds with a little oil, placing them on a metallic or glass plate (without filter paper), then weigh off 1,000 grammes cement, add 200 ccs. water, and work the mass for five minutes (a pestle is recommended). Fill the moulds, heaping full, and proceed as explained for sand briquettes. The moulds, however, must not be removed till the cement is sufficiently hardened.

As in beating in "neat" cement, briquettes of equal density are required, a very fine or very quick-setting cement will require a correspondingly larger quantity of water. The amount of water used should always be mentioned in giving the results of such tests.

Treatment of Specimens in Testing.—All test pieces must be tested immediately after being taken out of water. Since the speed at which the strain is applied has an influence on the results, in testing for tensile strength the increase of weight shall be at the rate of 100 grammes per second.

In testing for crushing strength, in order to get uniform results, the pressure should always be applied on the flat surfaces of the cube and not on the bottom or trowelled surfaces.

COURT OF COMMON COUNCIL.

The usual fortnightly Court of Common Council was held on Thursday last week at the Guildhall, E.C., the Lord Mayor presiding.

Women Sanitary Inspectors.—On the recommendation of the Sanitary Committee it was agreed to appoint another woman sanitary inspector (second-class) at a commencing salary of 100l. per annum. The Committee were authorised to advertise for candidates.

The Salaries of the Medical Officer of Health and the Sanitary Inspectors.—Some discussion took place on a recommendation by the Sanitary Committee that no action be taken in the matter referred to the Committee for consideration of applying to the London County Council for payment of half the salaries of the Medical Officer of Health and the Sanitary Inspectors.

Mr. John Harris moved as an amendment that the report be not adopted, but that it be referred to the Committee to make application to the London County Council as at first suggested. This was carried.

International Congress of Drainage and House Sanitation.—It was agreed to appoint representatives to attend the first Congress of Drainage and House Sanitation to be held in Paris, from November 1 to 8 next.

Crematorium, City of London Cemetery.—The Sanitary Committee submitted a certificate from the engineer that the crematorium at Little Ilford had been built in accordance with the plans approved by the Secretary of State for the Home Department in October, 1902. It was reported that the Medical Officer of Health, Dr. Collingridge, and the Police Surgeon, Dr. Gordon Brown, had offered to act as Medical Referee and Deputy Medical Referee in hon. capacities. The appointments were agreed to, and the Committee were authorised to make the necessary arrangements for the opening of the crematorium.

Streets Committee.—A lengthy report was submitted by the Streets Committee recommending the Court to consent to a large number of minor building operations and additions to buildings in the City. Among those to which consent was given was an application by the London Hydraulic Power Company to extend their mains in Tower-hill, Cooper-row, Lloyd's-avenue, and portions of Crutched-friars and John-street.

The Spread of Disease by Vagrants.—A letter from the London County Council asking the Corporation to appoint a member, together with the Medical Officer of Health, to attend the forthcoming conference on this question, was referred to the Sanitary Committee.

The Resignation of the City Surveyor.—The Officers and Clerks Committee submitted a report, in which they dealt with the letter from Mr. Andrew Murray, the City Surveyor, with reference to his retirement. The letter had been referred to the Committee with instructions to consider and report upon the nature, duties, and emoluments of the office, and also as to whether there should be any rearrangement of the duties at present discharged by the Engineer.

The Committee submitted a "List of Duties of City Surveyor," with proposed additions italicised. Paragraph 16 of this was as follows:—

16. To prepare designs, with preliminary sketches or drawings, plans, specifications, estimates, and working drawings as may be required (subject to Clause 19), to instruct the Quantity Surveyor who may be appointed to take out quantities, and to take all necessary steps to enable tenders to be obtained from contractors; to examine the materials intended to be used in all buildings to be erected or in any way altered or added to by the Corporation, and to permit the use of such only as are the best of their respective kinds; to superintend and direct the execution of all such works; to see that they are done in a workmanlike manner, and in conformity with the respective contracts and the Acts of Parliament and by-laws of local authorities for the regulating of buildings; to take the extras and omissions upon all contracts (no extras or additions being allowed, for which there is no previous order in writing from the City Surveyor), and make all necessary certificates thereunder; and generally to report thereon from time to time upon the progress of the works and upon proposed variations or otherwise.

The Clause 19 referred to read:—
19. These duties do not refer to or embrace the designing and execution of any work or works of an architectural character.

The Committee recommended:—

- That the office of the City Surveyor and Engineer should not be amalgamated.
- That a City Surveyor be appointed.
- That the salary of the office be 1,000l. per annum, rising, at the discretion of the Court, to a maximum of 1,500l. per annum.

iv. That the age of candidates shall exceed fifty years on the day of election.

v. That the position be advertised.

vi. That it be referred back to this Committee to receive applications and select candidates for final election by the Court.

Mr. Deputy Douglas Matthews moved the report be referred back for further consideration; particularly with regard to practicability of eliminating so many of the duties of the Surveyor as appertained to valuation and letting of land, and matters which were generally dealt with by auctioneer, and also the appointment of officers for these duties. This amendment was lost on a show of hands.

Mr. Algen remarked that with a salary so low a figure the best men would not forward. He would move as an amendment that the salary should commence at 1,500l. annum, as nothing under that sum should be offered by the City.

The Town Clerk pointed out that examination would involve the suspension of the standing orders, and ultimately matter was adjourned. Mr. Cooper gave notice of motion that the age limit should be placed at forty-five years.

OBITUARY.

A. BARTHOLDI.—Auguste Bartholdi, sculptor, to whose death reference was made last week in our columns, was born at Colmar in 1834. He began life as an architect, subsequently came to Paris to study painting in the atelier of Ary Scheffer; but turned his attention to sculpture, and became a pupil of Soitoux. In 1855 he exhibited the Salon a group entitled "Le Bon Samaritain"; and, two years afterwards, a statue of General Rapp. He subsequently executed a fountain for Bordeaux, and a statue of Martin Schongauer for the cloister of the museum at Colmar. We owe to him the figure of "Douleur" which adorns the tomb of Neftzer, and the statue of Coppion for the Collège de France. Better known dates from the time when he executed the colossal statue of "Liberté Eclairée" which stands at the entrance of New York harbour. We should mention among his works the commemorative monument of Basle; the group of Lafayette and Washington erected in the Place des Invalides; the monument to Gambetta at St. Etienne; the monumental fountain at Lyons; the monument to Sergeant Hoff which is to be placed in Père Lachaise; and the models for monuments to the aeronauts of the Sieges of Paris and for that commemorating the sieges of Belfort. It will be remembered that Bartholdi brought an action against the Corporation of Marseilles for not having carried out his design for the Palace of Longchamps, and given the preference to the work of Esperaudieu. This hard-working artist attained a good many honours at the Salons, exhibitions, and was promoted successively the grades of Chevalier, Officer, and Commander in the Legion of Honour.

Mr. TAIT.—We have to announce the death in his seventy-third year, of Mr. William Tait, of Glasgow, who practised engineering a long period as an architect in that city. He served his articles in the office of Messrs. A. and A. Heiton, of Perth. Messrs. A. and Mitchell, of Glasgow, made the plans for his designs six years ago for the Institute in West High-street, Forfar, founded by Mr. Meffan for purposes of a lecture hall, library, and museum.

Mr. RIDLEY.—Mr. Matthew Ridley, Superintendent of the Government Horticultural Gardens at Lucknow, died at Lucknow, on September 17, aged fifty-six years. He had about to retire from that position, which he had occupied during some thirty years. Mr. Ridley received his earlier training in Kew; his service in India as a landscape gardener has been marked by the great improvements which he carried out in the public gardens and parks around the Taj Mahal, as well as at Lucknow, more especially in the vicinity of the Residency and other places of historical interest in that city which are associated with the story of the Mutiny. Mr. Ridley traced his descent from the Bishop of London who was burned at the stake in 1555.

Mr. J. LEWIS THOMAS.—We regret to record the sudden death of Mr. James Lewis Thomas, F.S.A., F.R.G.S., late Chief Surveyor to the War Office, which took place at his residence, 26, Gloucester-street, Warwick-square, on the 4th inst., in his seventy-year. Mr. Thomas was educated at Christ Church, Brecon, and studied under Charles Barry. He had a long association with the War Office, serving abroad in

days. In 1855, he was appointed Surveyor to the War Department, and promoted to be Chief Surveyor, which he held till 1880, when he retired. The citation of hon. A.R.I.B.A. was conferred on him soon afterwards. He designed the Herbert Hospital, Woolwich, and other notable buildings of which he is the architect is the Royal Victoria Hospital at Netley, the drawing of which he made to Queen Victoria on the occasion of Majesty laying the foundation-stone in being at the same time presented to Her Majesty; he also designed the Herbert Convent Home at Bournemouth, erected to the memory of the late Lord Herbert of Lea. Thomas was a fellow of several learned societies, also a distinguished freemason; he was Vice-Treasurer of the Most Hon. and Ancient Society of Ancient Britons, which supports the Welsh girls' school at Ashford, and a brother of the eminent Breconshire poet, the late Mr. J. Evan Thomas, J.P. He was interred in Brompton Cemetery in the 3th inst.

GENERAL BUILDING NEWS.

CHURCH, CHANDLER'S FORD, HANTS.—The Rev. of Winchester dedicated a few days ago the new Church of St. Boniface, which has been erected at Chandler's Ford. The church is of red brick, with Bath stone dressings. At present only a portion of the work has been carried out. This consists of the nave and a small portion of the chancel, forming a temporary sanctuary. On the east side of the north transept a temporary altar has been erected, constructed from a roof of the nave is timbered and surmounted by a bell turret. The ceiling is of oak, and divided into panels, with a carved boss at each intersection. The walls are plastered inside, and the windows are all with leaded lights, filled with Cathedral glass. The floor of the nave is of wood blocks under the seats. The roof of the temporary sanctuary is raised 6 in. above that of the nave, and is composed of black and white marble. The building is heated by a hot-air system carried out by Messrs. Haden and Son, of Trowbridge. The seats are of oak, fumigated and polished. The vestry will eventually be of pitch-pine, but meantime seats from the old church will be used. The font, pulpit, lectern, and organ have been brought from the existing church. The remainder of the scheme consists of the completion of a parsonage, the ground for which has been reserved on the south side, the north and south transepts, but this only to be carried out when funds permit. The work of erecting the church has been entrusted to Messrs. Parnell and Sons, of Winchester. The architect was Mr. G. F. Bodley, of London, and Mr. C. Woodley acted as clerk of the works and foreman.

ST. ANNE'S CHURCH, WIMBORNE.—The laying of the first stone of the new Roman Catholic church, which is to stand at the corner of Merton and Latimer roads, and is to be dedicated to St. Winefride, a Holywell, took place recently. The plan comprises a wide nave with narrow aisles on either side, a sanctuary on a separate step above the nave level, and on one side by a side chapel, and on the other by priests' and boys' sacristies, a vestry on the north side, with a porch opening, giving access to that portion of the church, and a baptistry at the north-west end. The main entrance will be by a recessed arched doorway at the west end, and there will be also another entrance at the south-west corner. The total cost will be 112 1/2 £, and the width of the church will be 53 ft. Accommodation will be provided for between 600 and 700 persons, and the cost for 6,375 £. The architect is Mr. F. A. Smith and Sons, of Westminister, and Messrs. Smith and Sons, of Norwood, are the clerks of the works, and Mr. Bailey, of London, is the architect.

ST. ANNE'S, BRISTOL.—The foundation of the new Church of St. Anne's, laid by the Bishop of Bath and Wells on the 11th inst. The church will consist of a north and south aisles, north and south transepts, chancel, and morning chapel, and accommodation will be for 795. The whole building will not be proceeded with at present it is intended to construct the nave, and transepts, which will provide accommodation for about 700 people, and a temporary chancel will be erected at the east end of the church, and a temporary vestry at the east. The estimated cost of the whole is 5,800 £, and of the portions that have been first built about 3,000 £. The structure

is to be built of pennant stone, with freestone facings, and the interior is to be freestone work. The floors will be of oak blocks over the sitting areas, and of terrazzo cement paving for the walking ways and chancel. The roof is to be of red Broseley tiles, surmounted by a ventilating flèche on timber framing covered with sheet lead. The heating of the building will be by low-pressure hot water. Carved and moulded tracery will divide the chancel from the morning chapel, and the vestry and the north transept from the choir vestry. Chairs will be used for the sitting accommodation, except for the choir stalls. The pulpit will be of stone, carved and moulded. A porch will be placed outside the north entrance, and an interior porch at the west entrance, divided from the nave by a moulded partition of timber work. The east end of the chancel is to be formed as a portion of a regular octagon, and will be lighted by three open tracery windows. The architect is Mr. Henry M. Bennett, and the builders Messrs. E. Walters and Son.

CHURCH RESTORATION, GREAT STURTON.—The Bishop of Lincoln (Dr. King) reopened, on the 4th inst., after partial restoration, the village church of All Saints, Great Sturton, near Horncastle. It was found that the church, which dates back from the XIIth century, needed thorough restoration, being almost a ruin, but as this was impossible at the present juncture, it was decided to confine the work of restoration to the chancel arch and chancel. The architect in charge of the work was Mr. J. T. Micklethwaite, of London, and the contractor, Mr. Frank Bell, of Horncastle.

WEST HAM PARISH CHURCH.—The tower of the parish church of West Ham is in need of repair. It is a square embattled stone tower, 78 ft. in height to the top of the parapet, on which there is a turret 10 ft. high. It has been carefully surveyed by Mr. W. Weir, architect of the Society for the Protection of Ancient Buildings, who reported that, while the interior is in good condition and only needs to be kept weather-tight, the face of the tower is gradually perishing and many of the stones are loose enough to be dangerous.

ST. PAUL'S UNITED FREE CHURCH, CAMBS-LANG, N.B.—This church, the memorial-stones of which have just been laid, is situated between Bushyhill-street and Hamilton-drive. It is built of red sandstone, from Locharbriggs Quarry, in Dumfriesshire. The work is rock-faced rubble masonry. The building is of the Gothic style, erected from the designs by Mr. Alexander Petrie, Glasgow. The ground floor contains, besides a large hall, several classrooms, giving accommodation in all for 400 persons, also vestry, ladies' room, cooking kitchen, etc. Above the ground floor is the church and gallery (horse-shoe shaped), with sittings for 650, having an entrance door and staircase from both streets into a spacious lobby, the floor of which will be laid with marble mosaic. The pulpit platform is placed on the east of the church, with an organ recess at the back. The south or principal front faces Hamilton-drive, and has a porch projecting from the main wall of church. Above the porch is a large gable, having lancet-pointed windows and moulded niche between surmounted by a moulded cross. The other windows have stone mullions and transoms. The north-west and east fronts are treated in a simpler manner, being less exposed, and at some distance from either street. The interior of the church is divided into nave and aisles, the roof timbers being supported on columns having pointed arches between running east and west. The ceiling will be divided into panels having wood rib mouldings between the arches resting on corbels on the walls. It is estimated that the total cost of church and hall will not exceed 5,000 £.

WESLEYAN CHURCH, BEIGHTON.—At Beighton on the 11th inst. the memorial-stone was laid of a new Wesleyan church. The new building will provide accommodation for 350 worshippers. It is in the Gothic style, erected of Dunford-bridge stone, with Wingerworth stone dressings. The windows are of stained glass with leaded lights. At the rear are two vestries, for use by the minister and the choir, for whom accommodation is provided in a small chancel, instead of the usual gallery. At the sides of the chancel are the pulpit and the organ. The heating chamber is in the basement. The cost of the chapel is estimated at about 2,000 £, and the contract has been let to Messrs. Lund and Swann, of Ekeington. Mr. W. Cecil Jackson, of Chesterfield, is the architect.

WESLEYAN METHODIST CHURCH, LONG EATON.—A new Wesleyan church has just been opened at Long Eaton. It is built to seat about 700 persons, and has a tower at the south-east corner. The main entrance to the chapel is at the base of the tower, and leads into lobbies, which afford entrance to

the chapel itself. There is a central aisle, with pews on either side, and for convenience there are also side aisles to the same pews. The chancel is raised six steps above the level of the nave floor, with a pulpit on the right side and a dwarf screen on the left. The communion table is raised on three more steps. The back of the table is erected with alabaster, green, black, and yellow marble. The choir seats, the purling, 12 ft. high, and pulpit are in oak, with a tracered screen dividing the choir seats from the organ chamber. The length of the building is 150 ft., and the width 40 ft., and it has been erected at a total cost, with the school extension scheme included, of 11,000 £. The contractors for the building are Messrs. Pask and Thorpe, Nottingham, with the following sub-contractors:—Joiner, Mr. Appleby, Nottingham; heating, Messrs. Danks and Co., Nottingham; ventilating, Messrs. Ashwell and Nesbit, Leicester; marble mason, Mr. Gibson, Nottingham; brickwork, Mr. G. Yeung, Long Eaton, while the whole of the work has been executed from the drawings of Messrs. Brewill and Baily, Nottingham.

NEW BAPTIST CHURCH, SLOUGH.—The foundation-stones were recently laid of a new Baptist church at Slough. The building will be constructed of brick, with stone dressings, and will be 50 ft. long and 42 ft. wide. The plan provides for galleries on three sides with vestibules, a rostrum, and organ chamber, and two vestries which can be used as classrooms in connexion with the Sunday school. Accommodation is to be provided for a mixed congregation of 700, the seats to be of pitch-pine, and arranged in circular form with side aisles. The windows will be of stone frame work, with tinted glass. Provision is made for ventilation, and the heating will be by means of hot-water apparatus, constructed beneath one of the vestries, whilst the lighting will be with the electric light. The work is being carried out, from the plans of Mr. R. W. Moore, Bexhill, by Mr. H. Flint, of High Wycombe, at a cost of 3,867 £.

RENOVATION OF CONGREGATIONAL CHURCH, GRANGE PARK, STRATFORD.—The Grange Park Congregational Church has been renovated. The work has been carried out by Mr. Clark, from the directions and plans of Mr. J. W. Dunford, architect, of Walthamstead.

NEW CONGREGATIONAL CHURCH, BOURNEMOUTH.—The foundation-stones were recently laid of the new Congregational church in Charminster-road, which is being built by Messrs. George Shears and Sons, at a cost of about 4,500 £, from the designs of Messrs. Lawson and Reynolds. There will be seating accommodation on the ground floor for 450 people, and provision for 250 in the galleries, making a total of 700.

WESLEYAN CHAPEL, LONGWOOD, YORKSHIRE.—A new Wesleyan chapel has just been opened at Longwood. It is in the decorated Gothic style, with the roof half open, and is faced with Eiland Edge wall stones. The principal features in the front elevation are a doorway entrance, flanked with projecting pilasters and three two-light tracered windows. The church is 54 ft. 8 in. long and 30 ft. 6 in. wide, with transepts 11 ft. 6 in. deep, and will accommodate 700 persons. The body of the building is divided by two aisles, which communicate with a vestibule at the east end of the church. There are three entrances, one for the ground floor and two for the galleries, and also a side door for the use of the minister, choir, and scholars. There is a gallery on three sides containing two rows of pews. The internal woodwork is of pitch-pine, and varnished. The chapel is fitted throughout with open pews; the ceiling is boarded, and octagonal in shape; the windows are glazed with leaded lights, and the church is heated by hot water on the low-pressure system, and lighted by electricity. There are two vestries on the ground floor, and two classrooms in the basement, 32 ft. 5 in. by 20 ft., and 31 ft. 5 in. by 21 ft. 6 in. respectively, a bell-rooms, store-room, and underneath the latter is the heating apparatus room. There are two entrances to the basement and two flights of stairs leading to the ground floor. The church has cost 8,000 £. The plans were prepared by Mr. Joseph Berry, architect, Huddersfield, and the works have been carried out under his supervision. The following are the contractors:—Masons, Messrs. T. Bottomley and Sons, Lindley; joiners, Messrs. Wood Brothers, Huddersfield; plumber, Mr. Samuel Hale, Huddersfield; plasterer, Messrs. J. Robinson and Son, Marsh, Huddersfield; painter, Mr. Albert Wrigley, Longwood; slaters, Messrs. Thomas Allison, Ltd., Milnsbridge; ironwork, Messrs. Calvert and Co., Folly Hall, Huddersfield; electric lighting, Mr. Thomas Armitage, Huddersfield; heating engineers, Messrs. Tomkinson and Milan, Huddersfield; concreter, Mr. J. E. Dyson, Lindley, Huddersfield; gates and railing, Mr. T. H. Raynor, Huddersfield.

NEW WESLEYAN CHAPEL, LONGWICK, BUCKINGHAMSHIRE.—The opening of a new Wesleyan chapel at Longwick took place a short time ago. The building is of red brick, and will seat 120 persons. A couple of Boyle's ventilators are fixed in the roof, also several in the walls. The estimated cost is 5,000*l.*, and the architect was Mr. F. Taylor.

SCHOOL, SHIPMAN-ROAD, CUSTOM HOUSE.—The Shipman-road Council School was formally opened recently by the Deputy-Mayor. The hall is placed in the centre of the building on each floor at right-angles to the main axis of the building, and with a corridor 8 ft. wide to the right and left. Classrooms are grouped on each side of the corridor. The cloak-rooms and teachers' rooms are arranged at the end of the corridors, with staircases and entrances at the angles of the building. The school, which stands upon a site having an area of 1½ acres, consists of three floors. In each department there are eight classrooms, varying in capacity from forty-five to sixty school places. The heating of the school throughout is by low-pressure hot-water radiators, and provision is made for ventilation without mechanical aids. The contract for the building amounts to 25,763*l.*, and has been carried out by Messrs. W. Greger and Son, of Stratford, from the designs and under the supervision of Mr. William Jacques (Architect to the Committee).

NEW COUNCIL SCHOOL, LEYTONSTONE.—The new Council school in Norlington-road was opened a short time ago. The site of the structure has an area of 1½ acres, with a long frontage to Norlington-road, and a shorter return frontage to Pretoria-road. The main building of the school is arranged for three departments on three floors, each department occupying one floor. The infants' department, on the ground floor, has ten classrooms, with seating capacity varying from forty-four in the smaller rooms to sixty in the larger ones. Special provision has been made for very young children. The girls' department, on the first floor, and the boys' department, on the second floor, have eight classrooms each, the capacity per room varying from fifty to seventy school places. The total capacity for which the school is designed is:—Boys, 500; girls, 480; infants, 532; total, 1,512. Each department has, in addition, an assembly hall. The contract for the works amounts to 26,337*l.*, and has been carried out by Mr. F. J. Coxhead, builder, of Leytonstone; electric lighting by Messrs. Allin and Son; hot-water heating by the Lancashire Heating Company; terrazzo paving by the Mosaic Manufacturing Company; situ concrete paving by the Atlas Stone Company; to the designs and under the supervision of Mr. William Jacques, Architect to the Education Committee; Mr. G. W. Ramplin having carried out the duties of clerk of the works.

CHURCH HALL, STOKE NEWINGTON.—The foundation-stone of St. Andrew's Hall, Bethune-road, in connexion with St. Andrew's Church, Stoke Newington, has just been laid. The hall has been erected by Messrs. Sheffield Brothers, and the stonework and masonry has been carried out by Mr. C. W. Walters, of Lower Edmonton. Mr. Percy D. Smith is the architect. The dimensions of the hall are as follows:—The main hall (inside), 70 ft. by 36 ft. The front portion consists of a ladies' and gentlemen's cloak-room, a vestibule, lavatories, offices, in all 47 ft. by 17 ft. In the rear portion are ladies' and gentlemen's retiring-rooms, lavatories, offices, and a fireproof staircase leading into the hall above, which is 38 ft. by 20 ft. The main hall has an open-timbered composite roof, and the floor will be of polished maple.

TOWN HALL EXTENSION, KELSO.—At a meeting of Kelso Town Council on the 3rd inst. plans by Mr. Swanston, architect, of the proposed renovation and alteration of the Town Hall buildings were submitted. The total cost of the improvements, which include provision for a board-room and offices on the basement, which is at present an open space, also the renovation of the main hall on the second floor and the exterior facing up of the fabric, is estimated at 2,385*l.*

POORHOUSE, LEITH.—At a Dean of Guild Court held at Leith on the 3rd inst. warrant was granted to Leith Parish Council for the erection of the new poorhouse at Seafield, on the amendment of the plans to meet the Master of Works report. The site on which the poorhouse is to be erected is at the eastern extremity of the burgh, and extends to about 12½ acres. Accommodation will be provided for 659 inmates—364 from the main house, 203 in the infirmary, sixty-eight in the children's home, twelve in the married couples' quarters, and twelve in the probationary wards. There will also be accommodation for the members of the staff. The general division of the site aims at preserving the higher or south-westerly portion for the sick inmates,

the children, the officials, and the most deserving class of healthy inmates, while the undesirable class of healthy inmates and the labour department will be confined to the north-easterly portion of the site, the main house forming a screen between these divisions. The main house will be in the form of the letter H, the administrative department being in the connecting block, and the inmates' accommodation in the wings. The infirmary will consist of a centre block with four radiating wings, containing wards, and will include an operating-room and quarters for a resident medical officer and for a staff of nurses. In the phthisical block there will be accommodation for twenty-four patients. The plans are by Mr. J. M. Johnston, architect, Leith.

PREMISES FOR ST. GILES'S CHRISTIAN MISSION.—The foundation-stones of the new premises being constructed by the London County Council for the St. Giles's Christian Mission in place of the old mission buildings demolished for the purposes of the Holborn Strand improvement were laid on the 5th inst. The new buildings, which adjoin the site of the old premises in Little Wild-street, Drury-lane, are being erected from the designs of Messrs. Runtz and Ford, and consist of a chapel capable of seating 800 to 1,000 persons, with a schoolroom beneath.

LOUGHBOROUGH ELECTRIC LIGHTING STATION.—Although two or three weeks will probably elapse before Loughborough is supplied with electric light from a municipal source, the erection of the generating station and the laying down of the plant is rapidly approaching completion. The block comprises boiler-house, engine-room, battery-room, condensing-pit, and offices. The offices include the borough electrical engineer's room, general office, testing-room, workshop, and stores. The chimney shaft is 140 ft. in height. The buildings have been erected by Mr. A. Faulks from plans prepared by Mr. A. E. King, Mr. G. H. Saunders has acted as engineer's clerk of the works.

CONSTITUTIONAL CLUB, GAINSBOROUGH.—A new Conservative and Unionist club has been erected at Gainsborough from the plans of Messrs. Eyre and Southall, Retford and Gainsborough, architects.

BUSINESS PREMISES, BRISTOL.—New premises have been erected for Messrs. Lennards in White Ladies-road, Bristol. The total length of the frontage is 120 ft., and the warehouse of five stories reaches a height of 55 ft. Monks Park Bath stone has been used throughout. Messrs. R. Wilkins and Son, of Bristol, were the general contractors. Messrs. Dawney and Co., of London, supplied the steel work, and Mr. Smith, of Montpellier, undertook the carving. The premises were designed by Mr. H. Daro Bryan, architect.

EXTENSION OF THE VICTORIA HOSPITAL, DUNDEE.—A new wing of two stories, with the central portion raised to the height of three stories, is to be added to this hospital. The extension will abut on the west end of the existing buildings. On the ground floor the plan provides for a ward of ten beds. Adjoining is a ward kitchen and bathroom according to a dining-room for the patients. On the other side of the main entrance is an open verandah, which will form a resting-place for the sick. Adjoining is the nurses' sitting-room, and to the back is accommodation for napery and clothing. The first floor is similarly planned, on it also being a ward capable of accommodating ten patients. In the second story above the vestibule are two small wards of two beds each. The plans have been prepared by Mr. James Findlay, architect.

FREE LIBRARY AND LECTURE HALL, WORKINGTON.—The Workington new free library and Carnegie lecture hall, for which the Borough received 7,500*l.* from Mr. Carnegie, was opened on the 6th inst. by the Mayor. The building, after the Queen Anne style, has cost altogether 6,954*l.*, exclusive of furnishing.

NEW OPERATING THEATRE, QUEEN-SQUARE.—The Duchess of Albany attended at Queen-square on Saturday afternoon to open a new operating theatre at the National Hospital for the Paralysed and Epileptic. Mr. R. Langton Cole is the architect of the new building.

STANLEY HOSPITAL, LIVERPOOL.—On the 7th inst. two additions to the Stanley Hospital were opened; a new operating theatre, with rooms *en suite*, comprising anaesthetic and preparation rooms, and a vestibule formed for the isolation of theatre, and the withdrawal of patients. The several door openings are fitted with steel doors made by Milner's Safe Company, the window casements from the Crittall Company, the sinks and basins supplied by Messrs. Twyford and Shanks. All the walls are furnished in Parian cement on a Portland cement ground, the surface being painted with the Torbay Company's paint.

The pavements throughout are terrazzo. Other enlargement is an addition to patients' department, and consists of an operation theatre with male and female cover-rooms in direct communication with the theatre; new male and female rooms, and a surgeons' consulting-room approached from a central wide passage. The contractors are Messrs. Henshaw, Sons, and Messrs. Tomkinson and Co., respectively. The architect is Mr. Alfred Shaw, of Liverpool.

BATHS FOR CHELSEA.—The Baths Corporation of Chelsea Borough Council report Tuesday having adopted a scheme for building of the public baths. The main items are:—Building and engineering, 21,000*l.*; architects' and quantity surveyors' and clerk of works' salary, 1,530*l.*; swimming bath, 6,650*l.*; Turkish bath, 1,000*l.*; additional cost (over the 1,000*l.* already provided) for installing electric light, 5,520*l.*; artistic well and storage tank, 3,520*l.*; additional architects' and quantity surveyors' and clerk of works' salary, 1,000*l.* The committee have further decided (subject to sanction) to appoint Messrs. W. Anderson and the architects to carry out the scheme, and Mr. F. H. A. Harcourt, quantity surveyor.

NEW CO-OPERATIVE PREMISES, BURTON.—The new co-operative premises erected at Burnhope were opened on the 1st inst. The premises have been built to the designs of Mr. W. Forster, architect, at a cost of about 8,000*l.*

PUBLIC HALL, FOUR OAKS, BIRMINGHAM.—Four Oaks and Hill Public Hall, which has been erected at Meres Green, at a cost of nearly 600*l.*, was opened on the 1st inst. The building, which is situated on a site of 1½ acres, consists of a main hall, an assembly-room, 50 ft. by 25 ft., to accommodate 250 persons, a retiring-room, and several offices. It is built of Oldbury brick covered with Hartshill tiles. The building is lighted by both electric and gas. The contract amounted to 455*l.* Mr. Totley prepared the plans.

RESIDENTIAL FLATS, BIRMINGHAM.—A block of residential flats is about to be erected at Moseley. The plans for the work have been prepared by Mr. P. Stanley Dutton, architect.

MUNICIPAL BUILDINGS, TOTTENHAM.—The foundation-stones of the new municipal public baths, fire station, and coroner's building at Tottenham-green were laid recently. The general depot at the rear was first opened. Designs for the building have been obtained, these were submitted to Messrs. Taylor and Jennett, whose plan is now being carried out. Messrs. Lawrence and Son are erecting the new buildings.

regard to the general depot, the buildings were designed by the Council's Engineer, Prescott. The baths will cost 28,000*l.*, the fire brigade station 9,000*l.*, to 10,000*l.* the general depot has cost 18,000*l.* The depot buildings are divided up into fitting buildings—the offices, baths, fire station, coroner's court, and firemen's dwellings. The central block contains the Council offices, and the public offices, which have been placed on the ground floor, those for the engineer on either side of the entrance, those for the medical officer at the back, the principal staircase gives access to a corridor, from which open the chamber and committee-rooms, placed to look on to the green, and form the principal feature of the whole group of buildings on the public baths. This will contain swimming baths, first and second class, private baths for men and women, and a house for a superintendent with rooms overlooking the green. The first-class bath has been arranged so that it can be used in the summer swimming bath, and in the winter for entertainments or meetings, for which purpose a special entrance and cloak-rooms and exits in case of emergency. At the back of the baths are the boiler-house and lavatories with all necessary apparatus for heating the baths. A study has been made of the conjunction with the heating engineers' hope of obtaining the best and most economically-heated baths in the neighbourhood of London. The building on the south side of the site is the fire station. This will contain an engine-room for two engines, and a store-room facing the green. Above will be the fireman's house, a recreation room for the firemen, and some quarters for single men. At the back will be a cleaning yard, wash-stables, stores, workshop, etc. The court and fire quarters for married men are situated at the back of the site.

VED GLASS AND DECORATION.

ST. JOHN'S TOWN HALL, BIRKENHEAD.—A glass window, designed by Mr. Gilbert Gamon, of London, has been set in the main staircase of the town hall, which consists of three lights; the design depicts at hall of the Benedictine Priory of Ebury and James, at Birkenhead, and is dedicated to commemorate the judgment by Edward I. in 1277 of a dispute that had arisen as to rights of territory between King Edward III. of Scotland and Robert de Bruce, Prince Bishop of Durham. In the window are figures of the Bishops of Ebury and Dunblane, and Robert Bruce, Sir G. Garrick, and the Prior of SS. Mary and James, and the Chancellor of the Bishopric of Durham. In the middle light is King Edward I. seated, and habited in a costume upon that shown in his Great Seal.

FOREIGN.

PARIS.—The "Société Americaine des Beaux-Arts," composed of former American students of the Ecole des Beaux-Arts, has for the first time a competition for a "Prix de Rome," which will be to American students what the "Prix de Rome" is to students, and the winner will have a year of education at the Ecole des Beaux-Arts. A funeral chapel is being constructed in the crypt of Bourges Cathedral, to house the remains of the archbishops of Bourges. A monument to Talma has been inaugurated at Poix-du-Nord. M. Fagel, sculptor, has just completed the design for the Rhone connecting the department of Isère and l'AIN. There is talk of a new one over the Seine, between Boulogne-Billancourt. The clock at Gravelines, known under the name of the Bassin Vauban, is to be enlarged at a cost of 500,000 francs. M. Sanson, architect, has been commissioned by a wealthy individual to build a large chateau in Louis XV. style, on the estate at La Muette, between Avenue Raphael and the boulevard de la Chapelle. Six million francs are to be spent on the building. The Armenian chapel in Roubaix has just been opened. M. Guilbert, architect, and the decorative painter M. Leroy. The Government have commissioned M. Vernon, the medallist, to design a new Great Seal of France, to replace the present one from the Revolution of 1793. The Académie des Beaux-Arts has awarded the Felix Duban prize to M. Tony Garnier, architect of the Villa Mairea. M. Garnier, the sculptor, has just completed the design of the pediment sculpture of the new church of Arcis-sur-Aube, which has been assigned among the Monuments Historiques and is now to be restored at the expense of the State.

BERLIN.—The new "Kaiser Friedrich" at Berlin, designed and carried out by Herr Thine and Herr Hasak, is to be a model of the new style of building on an island formed by the Spree and the Havel, and consists of three stories; the top story, having a top light, is to be devoted to sculpture, the middle to sculptures, and the bottom floor to collections of coins, etc.

BRISTOL.—Herr Moses Burstyn, marine electrician, died on September 20, in his 67th year. A new asylum in Bristol was opened on September 27. The building is intended to accommodate 2,000 patients, with provision for further extension. The cost of the building amounts to £100,000. The building of the new hospital at Mattighofen, designed by Herr Bauer, is being superintended by Herr Josef Bauer. The work of the restoration of the cathedral at Parenzo has been entrusted to the architect, Herr Eduard Zotter.

RIO DE JANEIRO.—In August respecting the trade and industry of the capital of Brazil, Mr. Vice-Consul comments on the want of confidence in the fiscal policy of the country, and the consequent risks incurred by investors of foreign capital. For instance, attracted by the prospect of large sums, have been employed in the erection of flour mills throughout the State, and it would seem that the interests of the flour industry, in which British capital is largely invested, are somewhat jeopardised by the departure in favour of flour imported from the United States which is now exempted at 20 per cent. less duty than that on the like goods received from Brazil. Even building property has been found to be a safe investment in consequence of a law recently passed regulating the conditions for public purposes. This law provides that the old processes and basis of valuation, which indemnity prevailing when present conditions required their properties, and places them in the absence of mutual agree-

ment, in the hands of three arbitrators, one of whom is nominated by the authorities, the second by the owner, and the third by the judge in charge of the case. No doubt operations connected with the present city improvements have been much expedited by this arrangement, and, in fact, the law was passed with this particular object, but there is a feeling that the interests of proprietors have not always been adequately acknowledged. The extensive building operations which must ensue upon the present demolition of large areas of the city should afford an opportunity to the suppliers of builders' furnishings greatly to increase their sales. Suppliers of material for street paving should also keep themselves informed of the requirements of Rio, as new methods have for some time been under trial. As a result, asphalt paving is to be adopted over a section of about 30,000 sq. yds., and it has been decided to experiment over an area of some 1,200 sq. yds., with a description of bituminous bricks made in Amsterdam.

CITY IMPROVEMENT IN MEXICO.—A glowing description of the improved condition of Mexico City is given in the Consular report of Mr. L. J. Jerome, who writes:—"If there are signs of progress in almost every part of the Republic, it is in the capital that they are most marked. In the last five years the transformation has been complete, but in another five years it will be even greater. Already, people who have been away for a short period of three years hardly recognise the town, so great has been the change. Clean asphalted thoroughfares, brilliantly lighted at night, new handsome streets, a whole new residential quarter, the magnificent new general post office, the new general hospital, the imposing piles of the new poor houses on the most approved modern principles, the parks and public gardens in the best of order and brilliant with flowers, many other public buildings in course of construction, as well as private houses, residential flats, and American steel frames, business houses in every stage, with armies of masons and carpenters working to complete them, and still more being projected and begun, are to be seen on all sides. With all the building that has been done rents are not lowered, and from all appearances are not likely to be for some time, so great is the demand, alike for houses, shops, and offices. Moderate-sized unfurnished houses of ten or twelve rooms let for from 15*l.* to 30*l.* a month, and rents in the suburbs are almost as high."

Mr. Jerome adds that the British colony in Mexico City has considerably increased, and although their enterprises are not so much advertised as the Americans, they are of importance, notably in electric light and power. The Montreal (Canada) Mexican Light and Power Company has acquired a controlling interest in the German Electric Light Company, and the Mexican Gas and Electric Light Company of London has completed its new modern power station at San Lazaro. The street tramways (the Electric Tramways, Ltd., of London), which is not altogether British, as both Germans and Americans control much of the capital, may be called a British undertaking; then on a smaller scale there are Englishmen making harness, and building carriages, and engaged in numerous trades, all of which, so to speak, have been created in the last five years. Canadians have been even more active, and a Canadian Commercial Club has been formed.

MISCELLANEOUS.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—At the opening meeting of the session the President, Mr. Wm. H. Baxter, delivered his opening address on "The Training of our Apprentice Craftsmen." He deplored the backward tendency and the declining skill on the part of the workman, which was causing quite as much concern in America and Germany as in this country, and emphasised the necessity of greater attention to technical education on the part of both workman and employer, quoting from the reports of the recent Mosely Commission in support of his views. Professor Gourlay moved a vote of thanks to the lecturer, which was seconded by Mr. C. Ernest Monro.

DEMAND FOR ROOFING TILES IN SOUTH AFRICA.—The *South African Trade Journal*, published at Cape Town, asserts that there is a constantly growing demand for roofing tiles in the building trade in South Africa. While objection is raised to their employment on account of the greater difficulty entailed in the matter of forming a water-tight roof, public taste is beginning to incline more and more in their favour. It is added that the manufacture of these goods has been entered upon in many quarters of South Africa, but that there is still ample scope for enterprise on the part of United Kingdom manufacturers. "In any case," observes the *Journal*, "the demand for

their manufacture in South Africa is likely to steadily grow for some considerable time to come, and this feature is well worth the attention of the manufacturers concerned."

SIAMESE TEAK.—In his report on the trade of Bangkok for the year 1903 Mr. Beckett, the British Consul, states that the teak export was a very large one. In fact, the export (53,146 tons, of which 1,508 tons were sent to the United Kingdom), valued at 439,675*l.*, was the greatest that has ever been recorded, the nearest approach to it being in 1894, when it was put down at 57,719 tons. According to the Consular Commercial Report for 1895, however, the export for that year, which was stated in the returns of the custom house to be 48,934 tons, really amounted to 61,823 tons, which, if correct, would leave the record with that year. At all events the increasing, and its total value more than 10,000 tons in excess of the average of the last five years. Prices of first quality teak logs remained fairly steady at from 9*l.* to 9*l.* 10*s.* per load f.o.b., and first-class teak planks from 10*l.* to 12*l.* 10*s.* per load, according to specification. Best second-class logs fetched from 5*l.* to 6*l.* per load. In India prices at Bombay advanced rapidly towards the end of the year, the highest levels on record for Siam teak being reached in January of this year. Calcutta prices only partially followed the advance in Bombay. The export of miscellaneous woods fell nearly 5,000 tons below the previous year. It is to be regretted, Mr. Beckett remarks, that more use cannot be made of the many valuable woods to be found in the forests of Siam. Cost of extraction and transport doubtless mainly accounts for this. The export shows no sign of a resumption of increasing, and its total value during 1903 was less than 20,000 tons.

PROPOSED REGISTER OF EDINBURGH HISTORICAL BUILDINGS.—Baillie Dobie brought before the meeting of the Lord Provost's Committee of Edinburgh Town Council on the 5th inst. a motion with regard to the advisableness of preparing a register of all the old buildings in Edinburgh of historical or architectural interest, and considering whether any steps should be taken for the preservation of those considered of sufficient importance to be retained or restored, and report. The matter was remitted to a sub-committee.

THE BEDE MEMORIAL AT MONKWEARMOUTH.—The national memorial to the Venerable Bede, "the Father of English learning," was unveiled by the Archbishop of York on the 11th inst. The memorial takes the form of an Anglo-Saxon cross placed upon a site in the Cliff Park at Roker, near Sunderland. The cross stands on ground which once was the territory of the twin monasteries of Monkwearmouth and Jarrow, and is near the supposed birthplace and the tomb of Bede. The actual work of designing the memorial was entrusted to Mr. Charles Hodges, of Hexham, and the cross has been sculptured by Mr. Geo. W. Milburn, York. It is 25 ft. high, and the stone for it has, by permission of Lord Armstrong, been taken from his private quarry at Craghead. The shaft on the west side is ornamented with scroll patterns from the Lindisfarne Gospel, and from the stones at Monkwearmouth, and contains, within a twisted loop of the duck-hilled serpent seen on the Monkwearmouth doorway, pictorial subjects from the life of Bede. On the east side are Roman letters, giving two extracts from Bede's works—one from the Ecclesiastical History, and one from his life of St. Cuthbert. On the south side, within a vine scroll, is carved in alto and bas-relief the heads and busts of the friends and associates of Bede. On the north side a scroll introducing birds and animals, springing from a harp, emblematic of his poetic gifts, shows Bede's love of nature. Beneath these four sculptured sides runs in a band the verse written by Bede on his death-bed, beginning "Eboracæ, in Latin, in Rune, in Minuscule, and in English. On the block out of which the cross rises is carved a short inscription as follows:—"To the glory of God and in memory of His servant Bede.—673-735." The foundation for the cross has been prepared under the supervision of Mr. J. W. Moncur, the Borough Surveyor.

HOSPITAL ACCOMMODATION AT CHELMSFORD.—A Local Government inquiry was held at the Corn Exchange, Chelmsford, on the 3rd inst., before Mr. W. W. E. Fletcher, Inspector to the Board, into the application of the Chelmsford Joint Hospital Board for sanction to borrow 2,800*l.* for the extension of their Infectious Diseases Hospital in Baddow-road. The Clerk (Mr. A. S. Duffield) stated that the Board proposed to erect on the land at Great Baddow an additional block, consisting of one building to contain on the ground floor one ward with six beds, one ward with four beds, and two further wards with one bed each, ward kitchen, etc. On the first floor, over the

centre of the building, it was proposed to have one ward with two beds and one day-room. The estimated cost, exclusive of architect's fees, and incidentals, was 2,224. Plans and estimates, prepared by Messrs. Pye and Bacon, had been approved by the Hospital Board. After further evidence the inquiry terminated.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned appointments as follows:—Hackney—Mr. W. C. Vobe as an additional sanitary inspector; Lewisham—Mr. H. L. Hyde as sanitary inspector, in the room of Mr. A. J. Davis; Poplar—Mr. H. J. Langley as sanitary inspector *vice* Mr. E. J. Anthony, deceased; Southwark—Mr. F. Jenkinson as sanitary inspector, in place of Mr. H. Abson; Westminster—Mr. W. Williams as sanitary inspector, to fill the vacancy caused by transfer of Mr. T. G. Dea to a district in place of Mr. T. W. Calverley; Miss C. W. Byrne and Miss M. Carey as temporary female inspectors, from July 15, 1904, to January 17, 1905; Mr. A. L. Ware as temporary inspector, for a period of six months in the place of Mr. J. W. Kirk.

UNIVERSITY COLLEGE, LONDON.—Professor Simpson has commenced a course of instruction in Building Construction and Elementary Design. The system is that plans, sections, and sketch elevations of, say, a small country house are supplied to each student. On the next evening this design is presented drawn out in more complete form, with such modifications as each student may wish to make. This first design is in brick, with wood sash and casement windows. On subsequent evenings the different parts of the building are worked out to a larger scale. The first half of the evening is spent in criticising the drawings made during the previous week, the second half in lecturing on the particular subject for the ensuing week. The following are considered in detail, and exercises set on each:—Walls and bonding, footings and foundations, arches and offsets, chimneys and fireplaces, carpentry, roofs, floors and partitions, external plumbing, slating and tiling, drainage, joinery, skirting, windows, doors, staircases, etc. The result is a complete set of working drawings of one design. In the Spring Term one or more designs will be supplied as before in which various details of construction, such as stone walling, hollow walls, stone mullioned windows, steps, copings, structural ironwork, steel roofs, treproof construction, areas, etc., not previously considered, will be worked out.

Legal.

WHAT IS A "DANGEROUS" BUILDING? IMPORTANT CASE AT EASTBOURNE.

The Eastbourne Magistrates on Friday last week were asked to give their decision in a case which is of peculiar interest to owners and builders of household property. Some time ago a fire occurred at a large block of residential flats in that town. As a result it was discovered that the builder had used inflammable material beneath the hearths—a flagrant breach of the building by-laws—and the Corporation insisted that the defects should be remedied. The building having been taken over by mortgagees, a considerable hardship was placed on them and on the tenants of the flats. The owners undertook to carry out the work, and, in a majority of cases, met with no opposition. One of the tenants, however, Richard S. Topham, refused the owners, The Law Guarantee and Trust Society, Ltd., admission, and for that was summoned before the Eastbourne Borough Bench.

The Town Clerk (Mr. H. W. Fovargue), recalling the circumstances of the case, which had been before the Bench on several occasions, explained that there was a fire at Hartington-mansions, and it was discovered that it was due to improper material found at the back of one of the grates, and on examination every grate was found to be in the same defective condition. Notice was given to the mortgagees in possession giving orders that the defects should be remedied in accordance with the building by-laws. The work was promptly put in hand, but when the owners came to Mr. Topham's flat he refused to allow the work to be completed. The mortgagees offered to allow Mr. Topham to occupy an empty flat whilst the work was being done, but he declined to accept that offer. Mr. Topham contended that his agreement should be cancelled, but the owners refused to take that course. A sum of twenty guineas as compensation was suggested, but this the mortgagees declined to pay. Mr. Ronald, as representing the mortgagees, contended that the mortgagees were innocent parties, because the buildings were erected by the mortgagor, a builder named Ellis, and the mortgagees

now in possession were not responsible for the defects. It was therefore extremely hard on them to be called upon to execute the work, and they had alleged a negligence on the part of the building surveyors in failing to see that the work was properly done at the time the flats were erected. That, said the Town Clerk, was not an unreasonable complaint, but, speaking on behalf of the building surveyor, it was impossible for him to see every detail in every building which was erected in Eastbourne, especially when men were desirous of evading the by-laws. If it was incumbent on him to see every detail it would be necessary to have a building surveyor on every building from morning to night while building operations were in progress. The Corporation could not recognise any responsibility whatever in respect to any negligence made by their surveyor. He respectfully suggested that the Court was not one of equity, and therefore the question of compensation was not one for them to consider.

Mr. P. Lawson Lewis, on behalf of Mr. Topham, said that as the case had been adjourned to permit of a summons being served upon the owners, and as that had been done, the case against the owners should be heard before a decision was given in Mr. Topham's case. If the action failed against the owners, then, of course, it would fall against the tenants.

Mr. S. A. T. Rowlatt, who appeared on behalf of the owners, did not object to this course, and agreed with Mr. Lewis that if the application against the owners did not succeed, then the proceedings against the tenant must fail. The owners were perfectly willing to commence the work instantly, but they contended that the order could not be made against them.

Mr. Mayhew (one of the Magistrates) pointed out that the work could not be carried out without the consent of Mr. Topham, and counsel agreed with this view.

It was eventually decided that the case against Mr. Ronald should be taken before the decision was given in Mr. Topham's case.

Mr. F. J. Ronald, of Quality-court, Chancery-lane, London, was summoned in respect to Nos. 5, 15, 17, 18, and 20, Hartington-mansions for failing to carry into effect within forty-eight hours, an order made upon him by Mr. William Chapman Field, Building Surveyor to the Borough of Eastbourne. The Town Clerk admitted that the onus was upon him to prove that the building was dangerous, and the Borough Surveyor gave evidence that, in consequence of the fire, it was discovered that inflammable materials had been used in making the hearths, and that it was a source of danger to the occupants. The building was therefore dangerous.

Mr. Rowlatt argued at some length that the case did not come within the purviews of the "dangerous construction clauses," and should therefore be dismissed. The section, he said, was intended to apply to structures which were dangerous because they were insecure or ruinous, but it was ridiculous to say that a building was "dangerous" because it contained defects, and because one grate was defective it did not follow that all were.

The Bench, adopting this view, dismissed both summonses. They thought, however, that the work should be carried out, and that compensation should be allowed the tenant as suggested in the case. Defendants applied for their costs, but the Bench declined to make any order as to that.

EMPLOYERS' LIABILITY ACT.

"PACKING" AND "FENCING" SAW BENCHES. JUDGE STONOR, on Monday, at the Marylebone County Court, delivered judgment in the case of Smith v. Giles, which was fully reported in the *Builder*, July 25 last. The plaintiff was George Smith, a builder's machinist, 2, Chichester-road, Kilburn, N.W.; and he claimed damages, under the Employers' Liability Act, against Mr. William Giles, builder and contractor, 25, Macroom-road, Paddington, W.

Mr. Abinger was counsel for the plaintiff, and Mr. Shakespeare, counsel, appeared for the defendant.

The facts of the case are clearly stated in the judgment, as under. His Honour said:—In this action the plaintiff claims damages under the Employers' Liability Act for injuries sustained by him in defendant's employ—namely, the loss of a portion of the second, third, and fourth fingers of his left hand. . . . The plaintiff has been unable to work since the accident, and may continue so for some time longer. The accident occurred on December 12, the plaintiff's hand coming in contact with a circular saw whilst he was in the act of replacing a "slip" or board—which he was holding and guiding, to be cut by the saw—in consequence of the slip having fallen or rather shifted from what is called the "packing"—namely a piece of wood

placed on the saw-bench beneath the slip for the purpose of raising the same. The plaintiff contends that the accident happened in consequence of three defects in the machine and the consequent mode of working. The first of such alleged defects is that the saw was fixed and not raisable; the second, the saw was of too great diameter defects rendering the use of packing necessary to raise the slip. The third of such alleged defects is that there was not a guard in rear of the circular saw.

The issues in the present case appear, therefore, to be:—Whether the defendant is negligent in not having (1) a raisable, (2) a saw of loss diameter; or (3) a guard in rear of the saw.

It appeared by the evidence that first well as raisable, benches are very general and perhaps equally used by the trade it is obvious that the substitution of rails for fixed benches, and providing additional saws of various diameters, would present great trouble or expense, and would be open to practical objections; and it is not prepared to say that the defendant has been guilty of negligence within the Employers' Liability Act in continuing to work with fixed benches, not having saws of various sizes, and consequently using packing hitherto, which appears to be, roughly speaking, the course followed by half the trade at the present time. (See the case of *Whiteley v. McGregor*, Q.B.D., 376.)

With regard to the third issue, the fact that the defendant was not using guards on the saw-bench is quite obvious, and can easily be prevented by a trifling expense without further trouble or inconvenience. Guards also are very general in the trade at the present time, and only objection I have heard made to them is that the men cannot be got to use them. Upon the whole, however, having regard to the case of *Walsh v. Whiteley*, and cases bearing on the subject, I do not feel justified in finding for the plaintiff on this third issue any more than on the first and second issues. I should notice that the defendant, at the hearing, raised the defence of *volenti non fit injuria*, but the plaintiff proved that he had objected to the dangerous mode of working in question, remonstrated with the foreman, who proposed to get smaller saws. This defence consequently failed according to the case of *Holmes v. Clarke* (30 L.J.R., Exch., 15), the present action there must be a verdict for the defendant, but I think that it is a verdict which I ought not to give costs.

Judgment accordingly. It is understood that the man will claim under the Workmen's Compensation Act.

FAILURE TO DEPOSIT PLANS.

At Southwark, on Wednesday, Henry builder, of 81, Peckham-rye, was summoned before Mr. Baggallay by Sanitary Inspector Hoskins, on behalf of the Bermondsey Borough Council, for failing to deposit a plan of a building, the defendant's name being that of the Alma London County Council, Bermondsey, contrary to the London County Council by-laws. The defendant said that he had done a considerable amount of work for this school, for which he had given the principal authority the required plans, and before the men left the job the architect instructed them to put in a new gully in rear of an old one, and a new pipe. The defendant was away on his holidays at the time, and the men omitted to send a plan of this pipe and additional work before commencing it. Sanitary Inspector Hoskins, in reply to the defendant, admitted that plans had been deposited with regard to the other works. Mr. Baggallay: And do you say that another plan was required before this little extra pipe work was done? The witness: Yes, by the by-laws. Mr. Baggallay: This is an essential part of municipal terrorism. Here the man doing a lot of work and plans for a building have been deposited, because he has one in one pipe and one little gully you summon him for not giving another plan. Sir W. Grantham is indeed right. The summons is dismissed; it is perfectly preposterous.

BOROUGH COUNCIL AND DWELLINGS COMPANY.

At Southwark Police Court, on Wednesday, the National Model Dwellings Company were summoned before Mr. Baggallay by the Southwark Borough Council for failing to comply with notices requiring certain saw work to be done at Queen's-buildings, Borough. There were twenty-one defendants in all. Mr. Topham, who appeared for the Borough Council, said that Queen's-buildings, of which the defendants were the owners, comprised 670 tenements, eleven shops, and 3,000 persons. The defendants were very

plying with the Council's notices; some were for which these summonses had been served upon them last May. Mr. Wyles, secretary and manager to the City, said the defendants attended to the matter as rapidly as possible. When there was question of a nuisance the matter was put immediately, but in these cases, where construction of the lavatories was required owing to what might be called a "sanitary" some time was necessary in order to work. He had received altogether 101 notices this year requiring new work to be fitted, and he had complied with four. He kept two plumbers and a boy fully employed at the work. The Company not paying any dividend, and the repairs in 1903, this year. Mr. Baggally: That in 30s. a house. Many of us would be glad if you spent only that on repairs. Wyles: We are doing the work as fast as can. You see it is not as if these were temporary buildings; the death-rate is less than half of the rate for the whole of South London. Mr. Baggally said the defendant employ more men in order to get the work done more quickly. They would be 5s. 6d. and 5s. 6d. costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

1903.—M. N. RIDLEY and T. I. MILL: *Slabs, Blocks, Beams, Arches, Columns, Walls, Roofs, and the Construction of Concrete and Metal.* Blocks, beams, arches, flooring, columns, like, constructed of concrete and metal, taking the form of two or more dovetail sections, the grooves of the sheets being set transversely of one another.

1903.—J. DELASSEE: *Cork Matting Use as a Covering for Floors and Furnishings and for various other purposes.* Mat made from corks or pieces of cork are so united together by means of a passed therethrough, and attached to their framework that the corks lie either in rows or in decorative designs, for the latter object the corks may be coloured and finished.

1903.—P. E. J. A. CHAMPEME: *Refrigerating Chimney Cowl, Ventilators, Sky-lights, Turrets, and the like.* Directing chimney cowl for the purpose of facilitating draught, substantially consisting of a vertical spindle fixed upon a support mounted at the upper extremity of the chimney; the said vertical spindle being tapered at its upper portion and provided with a collar, which is rigidly connected with the upper portion of the chimney, and which receives a tapered lower aperture and internally with the lower portion of the sleeve being provided with recesses furnished with balls resting in place by a collar surrounding the

1903.—P. J. SADLER: *Brick Kilns.* Kiln consisting of an arrangement of flues and dampers between the top of one kiln and the top of another, chimney to each kiln with a main con- flue from each to a stack or fan.

1903.—W. LUCY AND CO., LTD., and LAWRENCE: *Means for Supporting the Sides of Bookcases, and the like.* A device for this invention a vertical rack or is, or are, formed on the uprights at the end of the shelf and the shelves are supported by bearers having formed on them a series of serrations which engage the racks. The bearers are of such a length that when in position they will not allow of movement of the bearers. Preferably the racks or bearers which may be of any convenient material are cast in one with the uprights, and the bearers is made in one with the

1903.—R. CHANTREY: *A Siphon Water-Preventing Apparatus.* The invention relates to the siphon portion of the apparatus. According to the invention the siphon is constructed of two tubes one above the other; the tubes being of such a diameter as to leave sufficient space between the flow of the water which is forced into a cylinder provided with a float, under being provided with a flat valve top. When the water reaches top said inner tube it passes down such

these applications are in the stage in which they are to the grant of Patents upon them can be made.

tube to the flush. The outer tube is covered over.

17,116 of 1904.—W. ECKSTEIN: *Means for Opening and Closing Fanlights, and the like.*

The object of this invention is to provide means for opening and closing a fanlight or the like by which the light may be held steady in any position. This is accomplished by fixing to the light a pin which enters a spiral groove in a disc pivoted to a bracket fixed to the frame at the side of the light.

17,235 of 1904.—C. ROBIN: *A Composition for the Manufacture of Ceramic Products.*

This invention relates to a composition for the manufacture of ceramic products such as bricks, tiles, pipes, and all kinds of earthenware. The new composition is characterised by a high ratio between the weights of the silica and alumina contained in it, which enables ceramic products of great lightness to be made from it. While in those clays the richest in silica which have heretofore been used for the manufacture of bricks and other earthenware products, the ratio of the silica to the alumina is not more than 3 to 3.5, and is generally 2 to 3, this ratio is increased to about 6 in this improved composition. A mixture which has been found to give good results in practice is composed of the following ingredients in about the proportion specified:—Silica, 60; alumina, 15; oxide of iron, 15; lime, 4.5; magnesia, 1.5; water, carbonic acid and organic matter, 12; total 100. This composition can be made either from suitable earth obtained directly from the ground, or by mixing several earths or substances of different origin.

19,644 of 1903.—F. J. TALBOT: *Means for Purifying Air.*

Means for purifying air, consisting in the combination of a fan, discs enclosing the sides of the vanes, a central air inlet opening, a permeable material around the outer extremity of the vanes or periphery of the fan, a casing enclosing said fan, a water tank at the lower part of said casing through which the periphery of the fan passes, a diaphragm extending from one side of the fan casing nearly to the periphery of the fan to form a water seal and an air delivery pipe or duct.

22,534 of 1903.—W. SHARPE: *Non-slipping Segmental Wood-paving Block.*

A wood-paving block made up of segments compressed together, the segments being held in position by stout wires running in grooves cut in each of the two sides of the block. The ends of the wires (the points of which are barbed) are bent at right angles and pressed into the end segments of the block. The segments vary slightly in length, the top of the block presenting an uneven surface.

22,597 of 1903.—T. WATSON: *A Fixing Brick.*

The bricks are made from blast furnace slag, run into water when in a molten state (and known as slag sand) or mixed with cement lime, sand, and like substances, made into bricks by mechanical pressure sufficiently dense to hold nails driven into them. These bricks are intended to be built into walls and chimney breasts of dwelling-houses, and other buildings for the purpose of holding and fixing the woodwork in the desired position, and as a substitute for wood plugs and wood blocks, thus reducing the risk of fire.

6,925 of 1904.—D. D. MCBARN: *Devices for Removing and Excluding Water while Constructing or Repairing Subaqueous and other Masonry.*

A device for sealing locks in masonry, comprising an impervious flexible sheet covering the opening, its extended edges being sealed in to the adjacent material, and being adapted to receive a layer of superposed masonry, and means for draining off the flow of water from underneath the sheet until the superposed masonry has set and afterwards closing the same.

17,015 of 1904.—C. H. GRAY: *India-rubber Tiles for Flooring, and the like.*

The present invention relates to improvements in india-rubber tiles for floor coverings, and the like and is particularly applicable to floorings of the kind described in the British Patent No. 6,339 of 1903, granted to Sir E. J. Harland and C. H. Gray, the object being to provide antiseptic india-rubber tiles suitable for use on ship board, in lavatories, and the like. According to the invention an antiseptic such as carbolic acid, chloride of lime, or the like is incorporated with the india-rubber of which the tile is formed, and the resulting tiles may be laid down separately, or may be combined into sheet and laid down in that form. Conveniently from 1 per cent. to 10 per cent. of the antiseptic may be used, but this proportion might be largely increased if desired.

TO CORRESPONDENTS.

R. W. E.—J. H. (Amounts should have been stated). —J. G.—J. H. F. (Below our limit).

NOTE.—The responsibility of signed articles, letters and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications, and the Editor cannot be responsible for losses, manuscripts, or other documents sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

September 29.—By SPELMAN'S (at North Walsham).	
North Walsham, Norfolk.—"The Lawn" and 3 a. 3 r. 9 p. l.	£1,525
Two houses and s. l. and c. g. yr. 354.	570
Two copyhold cottages	140
Impropriate tithes rent charge of 6311. 0s. 8d. Sketton, Norfolk.—A small holding, 23 a. 2 r. 10 p. l. and c.	325
By W. LUDLOW & BESCOE (at Birmingham). Knowle, etc., Warwick.—Remaining portions of the Packwood Estate, 117 a. 2 r. 32 p. l. (in lots)	7,960
October 4.—By E. H. HENRY.	
Battersea.—3 Northcote-rd. (s.) u.t. 82½ yrs., g.r. 15½, c.r. 100l.	1,000
Clapham.—70, Chelsea-rd., u.t. 57½ yrs., g.r. 8½, y.r. 50l.	440
Oreenwich.—Humber-rd., l.g. rents 21½, u.t. 69 yrs., g.r. nil.	390
Penge.—Croydon-rd., l.g. rents 26½, u.t. 58 yrs., g.r. nil.	500
By MELLERSH & HARDING.	
Regent-street.—14, Ganton-st. (s.), l., y.r. 115½, l.s.	1,600
Clapton.—10, Powerscroft-rd., l., y.r. 50½.	800
By J. HARRIS & SON (at West Meon). West Meon, Hants.—"East End Villa," and 4 a. 2 r. 4 p. l.	2,300
"East End Cottages" (three), and 0 a. 2 r. 9 p. l.	320
"Chappett's Farm," 22 a. 2 r. 17 p. l., l.y.r. 30½.	650
"Garrett's Farm," 23 a. 3 r. 5 p. l.	600
"Shatt's Farm," 19 a. 1 r. 34 p. l.	300
"Elmcroft," "Geneva Cottage," and 3 a. 0 r. 22 p. l.	1,400
"Cleeve's Farm," 12 a. 1 r. 22 p. l.	850
Sixteen freshold Cottages	2,000
"Lynch Meadow," 2 a. 3 r. 29 p. l.	170
Three freshold fields, 10 a. 2 r. 27 p. l.	560
"Ivy Cottage," l.	380
October 5.—By H. DONALDSON & SONS.	
De Beauvoir Town.—70, 76, 80, 82, and 84, Buckingham-rd., u.t. 20 yrs., g.r. 26½, y.r. 170l.	1,210
Buckingham-rd., stabling, coach-house, and yard, u.t. 19 yrs., g.r. nil, w.r. 22½.	115
Hackney.—22, St. John's Church-rd., u.t. 58 yrs., g.r. 4½ 10s., c.r. 30l.	370
October 6.—By BALCH & BALCH.	
Holloway.—15, Foylings-rd., u.t. 66 yrs., g.r. 5½ 10s., p.	320
Kentish Town.—11, Clarence-rd., y.r. 32½, also l.g.r. 4½, u.t. 24½ yrs., g.r. 4½.	205
By CRANFIELD & OLIPHANT.	
Battersea.—St. John's Hill, the "Prince of Wales" b.h., a freshold rental 50l., reversal in 1½ yrs.	3,500
By MORTON & WATERS.	
Edgware-road.—26, Star-st., u.t. 26 yrs., g.r. 35, p.	380
By NEWBORN, EDWARDS, & SHEPHERD.	
Holloway.—72 and 74, Mercer's-rd., u.t. 59½ yrs., g.r. 14½ 14s., y.r. 84l.	1,050
150, 152, and 154, Mercer's-rd., u.t. 71½ yrs., g.r. 21½, y.r. 127½.	1,480
Dalston.—47 and 71, Malvern-rd., u.t. 55 yrs., g.r. 18½ 18s., y.r. 82½.	680
Finchley.—Ballard's-la., "Wentworth Hall," l., y.r. 35½.	550
New Southgate.—Bowers-rd., "Belgrave," u.t. 63 yrs., g.r. 8½ 8s., y.r. 50l.	375
Islington.—38, Gibson-sq., u.t. 22½ yrs., g.r. 9½, c.r. 50l.	520
Canbury.—23, Canbury Pk. South, u.t. 32 yrs., g.r. 7½, y.r. 56l.	510
Holloway.—Fairmead-rd., "Fulford Houses" (flats), area 2,500 ft. 2, y.r. 444½ 12s.	3,500
By STANSON & SONS.	
Old Kent-road.—Nos. 769 to 775 (odd), area 10,700 ft. 2, y.r. 1494.	1,940
Dulwich.—12, 16, 18, 30, 32, and 34, Sharrowbury-rd., u.t. 64 yrs., g.r. 24½, w.r. 214½ 10s.	1,390
Bermondsey.—57 and 63, Canilla-rd., u.t. 31½ yrs., g.r. 9½, w.r. 634 14s.	410
Old Kent-road.—24, 28, and 28, Mina-rd., u.t. 17½ yrs., g.r. 12½, w.r. 78l.	445

Table listing real estate properties with details such as location (Forest Hill, Hextable, Bow), size (651, 307, 116, 20 and 22, 704, 18), and price (£1,130, 900, 565, 510, 775, 325).

MEETINGS. FRIDAY, OCTOBER 14. Architectural Association. Mr. E. Dockree on "Photography as Applied to Architecture." S. SATURDAY, OCTOBER 15. Institute of Sanitary Engineers, Ltd. Visit to the Lierun System of Sewerage at Stanstead. MONDAY, OCTOBER 17. Liverpool Architectural Society. Mr. G. H. Morton on "Modern Decoration." TUESDAY, OCTOBER 18. Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science). Mr. A. A. H. Scott on "Building Construction so far as it Relates to Sanitation." WEDNESDAY, OCTOBER 19. Architectural Association Discussion Section and Camera and Cycling Club (Joint Meeting). Mr. G. H. Smith on "Canterbury Cathedral." THURSDAY, OCTOBER 20. Carpenters' Company (Lectures on Sanitary Building Construction). Mr. H. D. Seale-Wood on "Construction of Water Closets."

PUBLISHER'S NOTICES.

THE INDEX (with TITLE-PAGE) for VOLUME LXXXVI (January to June, 1902), was given as supplement with the issue for July 9. CLOTH CASES for binding the Numbers are now ready, price 2s. 6d. each. READING CASES (cloth, with Springs, price 9d. each. THE HIGHLY SIXTH VOLUME of the Builder (bound), price Two Shillings and Sixpence, is now ready. SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

SIX LINES or under 6s. 6d. Each additional line 1s. 6d. SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS. Six lines (about fifty words) or under 4s. 6d. Each additional line (about ten words) 6s. 6d. TERMS for series of Trade advertisements, and for front page, and other special positions, on application to the Publisher. SITUATIONS WANTED (Single-handed—Labour only). Four lines (about thirty words) or under 2s. 6d. Each additional line (about ten words) 6s. 6d. PREPARATION IS ABSOLUTELY NECESSARY. "S" stamps must not be sent, but all sums should be remitted by Postal Order, payable to J. MOORE & Co., and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C. Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY. ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS to DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publishers cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent. PERSONS advertising in "THE BUILDER" may have Replies addressed to the Office, Catherine Street, Covent Garden, W.C., free of charge. Letters will be forwarded if addressed envelopes are sent together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication. AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing various materials and their prices. Includes sections for BRICKS, &c. (Hard Stocks, Rough Stocks, Facing Stocks, etc.), STONE (BATH STONE, PORTLAND STONE), and WOOD (White Oak, Yellow Pine, etc.).

SLATES (continued).

Table listing slate prices by size and type. Includes sizes like 20 x 10, 20 x 12, 18 x 10, 16 x 8, 18 x 10, 16 x 8.

TILES.

Table listing various tile types and prices. Includes Best plain red roofing tiles, Best Blue Faced Staffordshire, Do. Ornamental, etc.

WOOD.

Table listing wood prices by species and size. Includes White Oak, Yellow Pine, Fir timber, etc.

WOOD (continued).

Per square.	£ s. d.
ed Flooring (continued).....	£ s. d.
by 7 in. yellow, matched	0 11 0
by 7 in. white do. do.	0 14 0
by 7 in. white do. do.	0 10 0
by 7 in. do. do. do.	0 11 6
6 in. at 6d. to 9d. per square less than 7 in.	0 13 6

JOISTS, GIRDERS, &c.

In London, or delivered	£ s. d.
Steel Joists, ordinary	6 5 0
and Girders, ordinary	8 2 6
Tees and Channels, ordi-	7 17 6
sections.....	8 5 0
Iron Columns and Stan-	7 2 6
ds including ordinary pat-	8 5 0

METALS.

Per ton, in London.	£ s. d.
Iron Bars.....	7 5 0
Yorkshire Crown Bars, good	7 15 0
rehand quality.....	8 5 0
Steel Bars.....	8 15 0
Iron, basis price.....	9 5 0
Galvanized.....	17 10 0
And upwards, according to size and gauge.	
Iron, Black.....	9 15 0
ary sizes to 20 g.....	10 15 0
ary sizes to 22 g. and 24 g.	13 5 0
Iron, Galvanized, flat, best quality—	16 0 0
ary sizes to 20 g.....	16 10 0
ary sizes to 22 g. and 24 g.	18 0 0
Used Corrugated Sheet.....	13 15 0
ary sizes 6 ft. to 8 ft. 20 g.	12 10 0
ary sizes to 22 g. and 24 g.	13 0 0
ft. Steel Sheets, 6 ft. by 2 ft.	13 15 0
ft. by 20 g. and thicker	11 15 0
ft. Steel Sheets, 22 g. & 24 g.	12 15 0
ls, 3 in. to 6 in. wide.....	9 10 0
(Under 3 in., usual trade extras.)	

LEAD, &c.

Per ton, in London.	£ s. d.
Sheet, English, 3lb. and up	14 10 0
in coils.....	15 0 0
pipe.....	17 10 0
to pipe.....	17 10 0
Sheet.....	27 10 0
an.....	27 5 0
g Sheet.....per lb.	0 10 0
or nails.....	0 10 0
g Sheet.....	0 0 2 1/2
nging Fish Hooks.....	0 1 3 1/2
Plumbers'.....	0 0 6 1/2
en's.....	0 0 8
ipe.....	0 0 9

ENGLISH SHEET GLASS IN CRATES.

23d. per ft. delivered.	£ s. d.
birds.....	0 0 8
urths.....	0 0 8
urths.....	0 0 8
urths.....	0 0 8
urths.....	0 0 8
urths.....	0 0 8
urths.....	0 0 8
Sheet, 15 oz.....	0 0 8
ey's Rolled Plate.....	0 0 8
.....	0 0 8
.....	0 0 8

OILS, &c.

Per gallon.	£ s. d.
ased Oil in pipes.....	0 1 7
in barrels.....	0 1 8
in drums.....	0 1 10
in pipes.....	0 1 9
in barrels.....	0 1 10
in drums.....	0 2 0
ine, in barrels.....	0 3 4
in drums.....	0 3 6
Ground English White Lead, per ton	15 10 0
id, Dry.....	18 10 0
Oil Putty.....	0 6 6
lin Tar.....	1 12 0

VARNISHES, &c.

Per gallon.	£ s. d.
ak Oak Varnish.....	0 10 6
al Oak.....	0 10 6
le Pale Elastic Oak.....	0 12 6
tra Harl Churck Oak.....	0 10 0
es Hard-drying Oak, for seats of	0 14 0
ches.....	0 12 6
le Pale Elastic Carriage.....	0 16 0
le Maple.....	0 16 0
le Durable Copal.....	0 18 0
le French Oil.....	1 1 0
Flating Varnish.....	0 15 0
oil Enamel.....	1 4 0
le Fayer.....	0 12 0
an Gold Size.....	0 10 6
ak Japan.....	0 16 0
Mahogany Stain.....	0 9 0
ack.....	0 16 0
ack.....	0 10 0
nd Brush Polish.....	0 10 0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 18s. per annum (52 numbers) FREE. To all parts of Europe, America, Australia, New Zealand, China, Ceylon, &c., 36s. per annum. Remittances payable to J. MORRAN, should be addressed to the Publisher of "THE BUILDER," Cabot-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS, by prepaying at the Publishing Office 18s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder" by Friday Morning's Post.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the tender is stated, nor any list in which the lowest tender is under 100l., unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

ALNWICK.—For sewerage works at Radcliffe, for the Rural District Council:—
McLaren & Son, £230 0 0 | A. Douglas... £185 10 0
R. & G. Brown, 198 15 0 | R. Carse & Son,
J. Thompson... 189 17 0 | Amble*... 149 19 8

BOLTON-UPON-DEARNE.—For erecting Council offices and Carnegie Library, for the Urban District Council:—
Mr. J. W. Wilson, architect, Heyland:—
H. Sydney, Nora-street, Goldthorpe,
Rotherham..... £3,636

BOLTON-UPON-DEARNE.—For private street works, Nora-street, Goldthorpe, for the Urban District Council:—
H. Sydney, Nora-street, Goldthorpe,
Rotherham..... £749 12 6

BRENTFORD.—For forming new roadway and retaining wall at Kew Bridge, for the Urban District Council:—
Mr. Nowell Parr, Engineer and Surveyor,
Clidden House, Boston-road, Brentford:—
J. Macklin... £3,688 3 0 | Wimpey &
Wilkinson
Co. £2,815 0 0
Brook... 3,411 0 0 | Nowell & Co.,
E. Thacker... 2,750 0 0
T. Wain... 2,073 16 5
Jun... 3,321 9 9 | F. Ball..... 2,619 0 0
London and
County
Builders... 3,182 10 6 | Brentford... 2,549 0 0
Mowlem &
Co. 3,018 0 0 | Kavanagh &
Co. 2,547 0 0
W. Neave &
Son..... 2,825 0 0 | W. H. Wheeler 2,384 0 0

BRIDGEWATER.—For alterations to cottages on the Ashleigh Estate, for Mr. Albert Lewis. Mr. John W. Hill, architect. Quantities supplied:—
Fursland..... £145 | Bryer..... £140
Geen..... 143 | Glead Bros.*..... 138

BRIDGEWATER.—For walls, railing, and gates to private enclosures on the Ashleigh Estate, for Mr. Albert Lewis. Mr. John W. Hill, architect. Quantities supplied:—
Geen..... £171 0 0 | Fursland..... £139 0 0
Bryer..... 140 0 0 | Glead Bros.*..... 137 10 0

BROADSTAIRS.—For the erection of a pair of villas in Rectory-road, Broadstairs, Kent, for Mr. G. A. Holmes. Mr. W. L. Dowton, architect, City Bank-chambers, Bedford-row, W.C.:—
R. J. Court, £1,415 0 0 | J. T. May... £1,105 0 0
Huskell &
Grimby... 1,371 0 0 | R. E. Yates 1,150 0 0
H. W. Riggs..... 1,366 0 0 | E. Brown... 1,140 0 0
den..... 1,366 0 0 | Horro & Co.,
G. H. Fuggle 1,352 2 9 | hall & Son,
J. H. Forwalk 1,340 0 0 | Ltd. (in-
Price Bros. 1,332 0 0 | formal)... 1,024 10 0
G. Miriams... 1,209 0 0

DENABY MAIN.—For new hospital, for Denaby Main Collieries workmen, for the Workmen. Mr. H. L. Smethurst, architect, Colchester, near Rotherham:—
Salmon & Co., £4,651 17 6 | B. Robinson
Wellerman &
Bros. £2,558 0 0
Bros. 3,293 10 0 | B. Wortley,
Doncaster* 2,444 11 0

DORCHESTER.—For making-up the eastern half of Maunbury way, for the Town Council. Mr. G. J. Hunt, Borough Engineer and Surveyor, Dorchester:—
Grounds & Newton, Bournemouth* £715 12 4

DURHAM.—For building a house, for Mr. K. C. Bayley. Mr. Stephen Wilkinson, architect, 30, Mosley-street, Newcastle-on-Tyne:—
Graddon &
Son..... £1,295 6 0 | R. Gardner... £1,109 15 1
Arkless Bros. 1,271 1 6 | Cheston-ic-
W. Lodge... 1,227 0 0 | Street*... 1,099 0 0
J. G. Bradley 1,193 0 0 | H. C. Howe 1,097 0 0
Davison &
Bolam... 1,192 5 1

EGREMONT (Cumberland).—For erecting seven houses at Scurliff, for Messrs. Muncaster & Cook. Mr. J. S. Skone, architect, 1, Grosvenor-street, London:—
Mason: H. Tinnion, Flimby, Cumberland £906 10 0
Joiner: H. Tinnion, Flimby, Cumberland... 353 10 0
Plumber: W. Holloway, Queen-street,
Whitehaven..... 52 11 11
Plaster: J. Lawson & Son, Bordon-street,
Workington..... 175 0 0
Slater: E. Burrows, Station-road, Work-
ington..... 93 12 8
Printer: R. Downes, Main-street, Egremont 31 10 0

ELBURTON.—For the erection of dwelling house on site No. 8 of the Above Town Building Estate, Elburton-cross, near Plymouth, Devon, for Mr. F. J. Moor. Mr. J. Harvey, architect and surveyor, Plymouth:—
B. Gardiner, Elburton*..... £400

EPSOM.—For a detached house, Hylands Estate, Epsom, for Mr. W. J. Payne, and under the supervision of Mr. Arthur L. Dartnell, architect and surveyor, 34, High-street, Croydon:—
Roll & Taylor..... £825 | H. Bacon..... £697
Crompton Bros. 709 | W. Roberts*..... 629
Truett & Steel..... 740

HARROGATE.—For private street improvement works in roads off Walker-road, for the Corporation. Mr. F. Bagshaw, Borough Engineer and Surveyor, Municipal Offices, Harrogate:—
Bilton Drive.
E. Long, 5, Albert-street, Starbeck*..... £378 6 6
Back Road on N.W. Side of Walker-road.
E. Long, 5, Albert-street, Starbeck*..... £480 18 11

HERNE BAY.—For road works, Bellingde-road, for the Urban District Council. Mr. F. W. J. Palmer, Surveyor, Town Hall, Herne Bay:—
C. Cassell... £2,470 0 0 | J. Trueman... £1,956 0 0
G. Pordige... 2,125 0 0 | J. Mills... 1,985 18 9
W. Wilson... 1,544 0 0 | A. S. Ingleton... 1,467 0 0
Carr & Co... 1,723 0 0 | Herne Bay*
H. Beadle... 1,397 0 0

HERNE BAY.—For new drainage work, decorations, etc., to the Grand Hotel, Herne Bay, for Messrs. Mackesson & Co. Messrs. Law & Allen, architects, Dacre House, Arundel-street, London, W.C.:—
A. G. Ingleton & Co..... £367
W. W. Martin & Co., Ramsgate*..... 332

KING'S HEATH.—For erecting a depot, including a fire-station, for the King's Norton and Northfield Urban District Council. Mr. A. W. Cross, Engineer and Surveyor, 23, Valentine-road, King's Heath:—
G. W. Harvey, King's Heath..... £3,503

LITTLE BOWDEN.—For sewerage works, etc., Church-street, for Mr. J. W. Newcombe. Messrs. Coales & Johnson, architects and surveyors, Bank-chambers, Market Harborough. Quantities by architects:—
Thurley Bros. £317 8 8 | T. Panter... £909 10 11
Kirk & Dobson 673 19 2 | A. Jewell... 535 0 0
W. J. Payne 634 10 0 | T. Hickman,
J. Holme... 623 18 10 | Market Har-
G. W. Brown 619 0 0 | borough*... 509 11 1
G. H. Eastwood 610 0 0 | W. Higgins... 494 0 0
: Withdrawn.

LONDON EDUCATION COMMITTEE TENDERS.

Walworth, Mina-road (for Heating Apparatus).

W. G. Cannon & Sons.....	£1,075 0
O. Kite & Co.....	750 0
B. Clarke.....	723 0
Brightside Foundry & Engineering Co.	699 15
Wontner-Smith, Gray, & Co.....	649 0
Wippell Bros. & Row.....	630 0
J. Richardson & Co., Ltd.....	622 0
J. J. Deffies & Sons, Ltd.....	612 10
J. Yetton.....	597 0
Lancashire Heating Co., 34, Temple- courts, Temple-row, Birmingham*.....	520 0

No. 23, Blackheath-road, Greenwich (for Executing Sanitary and Decorating Works).

W. Martin.....	£162 A. Spears, 40, West- W. J. Howie... 149 minster Bridge-rd.* £90
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London County Council Sydenham Technical Institute (for the installation of the electric light).

Drake & Gor- ham.....	£239 0 0	Spagnoletti & Co., Gold- hawk-road, Waters... 167 16 7	W.* (alterna- tive No. 4)... 1150 0 0
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LONDON.—For the erection of a disinfecting station at Tooting, for the Wandsworth Borough Council. Messrs. H. J. Marten and P. Dodd, surveyors, Council House, Wandsworth:—
J. Nicks... £4,092 10 6 | Jones Bros... £3,233 0 0
T. S. Page... 4,005 7 3 | J. Garrett &
T. Pearce... 4,000 0 0 | Son..... 3,212 0 0
R. E. Wil-
liams &
Sons..... 3,790 0 0 | Ltd..... 3,197 0 0
H. Dakin &
Co. 3,574 0 0 | J. Wells... 3,105 0 0
C. Horro... 3,452 0 0 | B. E. Night-
Aldridge &
Son..... 3,280 0 0 | W. Lawrence
A. Leather... 3,267 0 0 | R. & Son... 3,064 0 0
Thistle &
Appleton... 3,245 0 0 | Co.*..... 2,748 0 0
W. Johnson
& Co. 3,239 0 0

LONDON.—For erecting central library, for the Green-wich Borough Council. Mr. Sidney Smith, architect:—
Founda-
tions-
structure.
F. J. Gorham..... £540 .. £4,093 .. £6,633
W. Mills..... 539 .. 6,077 .. 6,616
Harris & Wardrop... 610 .. 5,780 .. 6,448
H. G. Brown..... 648 .. 5,855 .. 6,445
W. Lawrence & Son,
Canal Works, Wal-
tham Cross*..... 690 .. 5,302 .. 5,992

LONDON.—For painting and other works at work-house and infirmary premises, for the Guardians of St. Leonard's Parish, Shore-ditch. Mr. F. J. Smith, architect, Parliament-mansions, Victoria-street, S.W.:—
P. McCarthy, 441, Fulham-road, S.W. £607

LONDON.—For alterations, decorations, etc., to 3, Stanford-road, S.W., for Mr. E. B. Crowe. Messrs. Law & Allen, architects, Dacre House, Arundel-street W.C.:—
Creaton & Co., 13, Lancaster-street, W. £394

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Desi be D
*School	Croydon Education Committee	Not stated	No

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Ten be D
Catchment at Pumping-station on Risby Warren	Seanthorpe U.D.C.	A. M. Cobban, Engineer, Seanthorpe, Doncaster	Oct
Connexion to Main Sewer	Wharfedale Omnibans	Mr. Jones, Workhouse Master, Newall, Otley	
Pipes	Covenry Corporation	J. E. Swinburnst, City Engineer, St. Mary's Hall, Coventry	
Cattle Market Improvements	Stockton-on-Tees Corporation	Borough Engineer's Office, Town Hall, Stockton	
Painting Deanhouse Workhouse Prem., Netherthong	Huddersfield Guardians	E. A. Rigby, Clerk, Union Offices, Ramsden-street, Huddersfield	
*Making-up Roads	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	Oct
Extension of Workshops, Upper Seymour-st., Bradford	Tamworth R.D.C.	H. A. Johnson, Engineer & Architect, 15, The Exchange, Bradford	
Telephonic Installation	Leicester Omnibans	Giles, Gough, Trollope, 28, Craven-street, Charting Cross, London	
Improvement to Cateshall-road and Bridge	Oodahming Town Council	J. H. Norris, Borough Surveyor, Municipal Offices, Godalming	
Arc Lamps, etc. (Contract No. 15)	Barrow-in-Furness Corporation	H. R. Burnett, Electricity Works, Barrow	
Broken Granite	Fulham Borough Council	H. J. Clason, Surveyor, 22, Church-street, Tamworth	Oct
3,000-Volt Main Generator Switchboard	Leeds Corporation	A. J. Fuller, Electrical & Consulting Engineer, Town Hall, Fulham	
Road Materials	Glamorgan County Council	S. Mitchell, Clerk, Council Offices, Horsham	
600 yds. Dwarf Stone Boundary Wall, East End Park	Aberdeen City Parish Council	City Engineer's Office, Leeds	
800 yds. Wrought-Iron Railings and Two Gates	do.	do.	
Surface Water Drain, Park-street, Bridgend	do.	T. M. Franklin, County Council Offices, Westgate-street, Cardiff	
Renovating Woodville-road Baptist Chapel, Cardiff	do.	W. Beddoe Rees, Architect, 37, St. Mary-street, Cardiff	
Electric Light Plant, Engines, etc., Oldmill Poothouse	do.	Brown & Watt, Architects, Aberdeen	
Steam Boilers	do.	do.	
Steam Distribution and Heating	do.	do.	
Non-Conducting Covering for Boilers	do.	do.	
Factory, St. George, Bristol	Bacup Waterworks Committee	J. H. Woodington, Bethel-road, St. George, Bristol	
Road, Fence and Walls, Cowpe, near Waterfoot	Rochdale Gas Committee	W. H. Elee, Borough Engineer, Municipal Offices, Bacup	
Water-Gas Plant, Wrought-Iron Boilers	East India Railway Co.	P. B. Hall, Manager, Gas Works, Duns-street, Rochdale	
Rolled Material for Construction of Waggon	do.	C. W. Young, Secretary, Nicholas-lane, E.C.	
Oalvanised Sheets and Wind Ties	do.	do.	
House, Sawley, near Nottingham	Glasgow Corporation	G. Newcombe, Draycott	
Reconstruction of Floor of Winter Garden	Southend-on-Sea Corporation	E. J. Elford, Borough Surveyor, Southend	Oct
Making-up Streets	Stepney Guardians	J. Rider, Esq., & Co., Bridge House, 181, Queen Victoria-st., E.C.	
Laundry Building at Workhouse, Bromley-by-Bow	Greenwich Borough Council	Borough Engineer, Town Hall, Greenwich-road, S.E.	
Paving, etc.	Devonport Corporation	Stevenson & Burstal, Engineers, 68, Parliament-st., Westminster	
3 1/2 in. of Pipe Sewer, East Greenwich	Coatbridge Town Council	Simpson & Wilson, 175, Hope-street, Glasgow	
Valve House, Swilley	Swansea Harbour Trustees	Carstaker	
Widening Bridge over Monkland Canal	Croydon R.D.C.	A. O. Schenk, Engineer, Harbour Offices, Swansea	
Paint, and Repairs, Minors' Institute, York-rd., Leeds	do.	R. M. Chart, F.S.I., Office of Council, Town Hall, Croydon	
Steel Vertical Tubular Boiler	do.	do.	
Banstead-road Sewer, Purley	do.	do.	
Street Works, Tavlor-road, Wallington	H.M. Office of Works	H. T. Gradon, Architect, Darham	Oct
Street Works, Mitcham	Admiralty	Supt. Engineer, H.M. Naval Estab., Royston, Inverkeithing, N.B.	
Wesleyan Methodist Chapel, Brandon Colliery	Manchester Gas Committee	City Architect, Town Hall, Manchester	
*New Sorting Office at Streatham	do.	do.	
*New Coastguard Buildings at Cockburnspath	Burma Railways Co.	A. G. Begbie, 76, Gresham House, Old Broad-street, E.C.	
Gas Meter Depot, Whitworth-street West	Norfolk Education Committee	G. Dickinson, Westholme, Bolton-on-Deerne	
Steel Structure, Part of Gas Meter Depot	do.	A. J. Scott, Architect, 24, Castle Meadow, Norwich	
Engine Shed Roofs	St. George-in-the-East Omnibans	Clerk's Offices, Raine-street, Old Grand Lane, Sheffield	Oct
Tower Restoration, St. Andrew's Church, Bolton	Bedwelly U.D.C.	J. H. Lewis, Surveyor, Blackwood, Mon.	
Additions, Coltishall Schools, Norwich	Levenshulme U.D.C.	J. Jepson, Surveyor, Guardian-chambers, Tiviotdale, Stockport	
Additions, Swanor Abbot Schools, Norwich	Selby U.D.C.	B. McC. Gray, Town Surveyor, Town Hall, Selby	
*Repairs to Roof of Infant Wards, Raine-street, etc.	Olsgow & South-Western Railway	Stores Superintendent's Office, Kilmarnock	
Valves, Derwent Aqueduct	Bishop's Stortford Guardians	A. G. Gwynn, Clerk, Bishop's Stortford	Oct
Road, Pengam	Steyning East R.D.C.	G. W. Warr, Surveyor, Council Offices, Southwick	
Private Street Works	Repton R.D.C.	C. E. Chamberlin, Clerk, Union Offices, Belvedere-rd., Burt'n-n-Trent	
Seaweging	Lighting Committee, Dublin Corp.	S. Clark, City Engineer, City Hall, Dublin	
Flooring Swimming Bath, Selby	Ipswich Corporation	F. Avton, Chief Engineer and Manager, Ipswich	
Stores	Milton-next-Sittingbourne U.D.C.	W. R. Warlow, Surveyor, Town Hall, Milton-next-Sittingbourne	
Cornish Boiler, etc.	Dunshaughlin Guardians	F. Morris, Clerk, Board Room, Dunshaughlin, Ireland	Oct
Private Street Works, Preston Rural	South-east-on-Tyne Corporation	E. J. Elford, Borough Surveyor, Southend	
Severing	Pontypridd Fresh Ld. Bld. Co., Ltd.	T. R. Phillips, Architect, Old Bank-chambers, Pontypridd	
Making-up Streets	Aldershot U.D.C.	do.	
Water Closets and Bathroom, etc., at Fever Hospital	Ollingham Corporation	E. C. Uren, Surveyor, Aldershot	
Refuse Destructor, London-road	Wirral R.D.C.	F. C. Priest, Engineer, Town Clerk, Ollingham, Ken.	
Twenty-eight Workmen's Cottages, Pontypridd	Aberbeeg (No. 5) Building Club	F. E. Priest, Engineers, 13, Harrington-street, Liverpool	
Road and Drains	Erdington U.D.C.	J. Rowlands, Olynceod, Llanbilleth, Mon.	
Granite	Ware U.D.C.	H. H. Humphries, Surveyor, Public Hall, Erdington	Oct
Open Corrugated Iron Sewer	Newcastle-on-Tyne Market Com.	City Architect, Town Hall, Newcastle-on-Tyne	
Sewer, Great Sutton	Inebriates' Home Joint Committee	J. Vickers Edwards, County Hall, Wakefield	
Twenty Houses at Aberbeeg, Mon.	Southwark Borough Council	Borough Engineer, Town Hall, Walworth-road, S.E.	
Broken and Unbroken Stone	Wood Green U.D.C.	Clerk's Office, Brook-street, Farnington, S.E.	
Broken Gurnsey or Quarant Quarant	Walthamstow U.D.C.	Council's Surveyor, Town Hall, Wood Green, N.	
Iron Pens, Boundary Wall, etc., Scotswood-road	Chatham Corporation	E. J. Partridge, F.S.I., Bank-chambers, Richmond	Oct
Pumps for Water Supply from Wells, Cattal	Sunderland Corporation	C. Davy, Borough Surveyor, Town Hall, Chatham	
*Erection of Museum Building	Walthamstow U.D.C.	J. C. Snell, M.Inst.C.E., Town Hall, Sunderland	Oct
*Engine's Workshop, etc., at Inebriates' Home	Caledonian Railway Co.	E. W. Holmes, Engineer, Town Hall, Walthamstow	
Making-up Roads	The Company	Office of Engineer, Buchanan-street Station, Glasgow	Oct
Electric Telephones at Workhouse, Grove-road	Heaton Norris U.D.C.	Vieers & Co., 4, Frederick's-place, Old Jewry, E.C.	
172 Yards of Wrought-Iron Fencing	Thorton, etc., Sewerage Committee	W. Banks, Engineer, Council Offices, Heaton Moor	
Electrical Machinery	do.	A. Hindle, Engineer, 44, Abingwood-street, Blackpool	
Heating Council Chambers, Town Hall	do.	do.	
Station Buildings at Larkhall, etc.	do.	do.	
*Formation of New Road at Wood Green	Mgm. Maint'ned Sels. Gt. Berk'hamst'd	C. H. & N. A. Rew, 185, High-street, Great Berkhamsted	
Gas Engines and Pumps, etc.	Wellingborough U.D.C.	J. M. Sharmam, Architect, Market-square, Wellingborough	No
Stoneware Pipes, Thornton Sewerage (Contract 17)	do.	do.	
Main Sewers—Northerly Portion (Contract 16)	do.	do.	
Main Sewers—Southernly Portion (Contract 15)	do.	do.	
*New School for Girls, Prince Edward-street	do.	do.	
Corn Exchange, Offices, etc.	do.	do.	
Cattle Pens, etc.	do.	do.	
Levelling, Draining, etc.	do.	do.	

ROTHERHAM.—For alterations and additions to St. Ann's Boys' School and alterations to out-offices at Ferham-street Schools, for the Education Committee. Mr. J. Platts, architect, High-street, Rotherham. Quantities by architect:—

Table with 2 columns: Name and Amount. Includes St. Ann's Boys' School, G. Saul, T. Green, R. Snell, J. W. Bygate, J. Cooper*.

Perham-street Schools. J. Cooper* £75

SALISBURY.—For erecting the Carnegie Free Library buildings in Chipper-lane, for the Free Library Committee. Mr. A. C. Robbans, architect, 32, Chipper-lane, Salisbury. Quantities by architect:—

Table with 2 columns: Name and Amount. Includes J. Long & Sons, Vincent & Fol-land, Bailey & Marlow, T. Dawkins, Webb & Co., W. Webb, E. Hale.

Accepted subject to certain variations.

SOUTHWOLD.—For erecting sixteen workmen's dwellings, for the Corporation. Mr. T. E. Key, architect, 5, Bloomsbury-square, W.C., and Aldeburgh, Suffolk:—

Table with 2 columns: Name and Amount. Includes C. Gimson, C. W. Fowler, J. C. Smith, E. Willmott & Sons, H. Thompson, A. G. Beckett, J. Wales, Lowes-tott*.

STRABANE (Ireland).—For erecting two cottages, Main-street, for Mr. J. M. Kane. Mr. Wm. Stuart, B.E. Men. San. Inst. Quantities by architect:—

Table with 2 columns: Name and Amount. Includes S. Donnell & Co., J. McGrath, Danl. M. Cafferty, Strabane*.

TAMWORTH.—For erecting two cottages, stabling, store-rooms, and sheds at Kettlebrook, for the Rural District Council. Mr. J. W. Goodridge, architect, Belvoir-street, Tamworth:—

Table with 2 columns: Name and Amount. Includes H. Clifford, G. Emery & Co., Watson & Sons, H. Bouson, B. Musson, Glas-cote*.

TOTTINGTON (Lancs).—For making-up part of Sobell-street and Holly-street, for the Urban District Council. Mr. L. Kenyon, surveyor, 33, Chapel-street, Tottington:—

Table with 2 columns: Name and Amount. Includes J. A. Greenhalgh, Radcliffe & Woodhead, Mosley-street, Bury*.

WALSALL.—For erecting a public library in Lichfield-street, for the Corporation. Mr. J. S. Gibson, architect, 5, Old Bond-street, London, W. Quantities by Messrs. Young and Brown, London:—

Table with 2 columns: Name and Amount. Includes H. Willcock & Co., Wolverhampton*.

WALTHAMSTOW.—For warehouse, Somers-road, Walthamstow, for Mr. A. G. Bean. Plans and specification by Mr. H. W. Oxley, surveyor, 4, Addison-road, Walthamstow:—

Table with 2 columns: Name and Amount. Includes E. Fuller & Son, J. A. Reed, J. & J. Dean, West Bros., Pettet, H. W. Stone, D. Fairhead, W. Mess, Green*, T. Stinfield & Co.

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ILLUSTRATIONS.

New Tower, St. John's Church, Cowley, Oxford.....	Mr. G. F. Bodley, R.A., Architect.
Beredos, All Saints, Maidstone	Mr. F. L. Pearson, F.R.I.B.A., Architect.
Design for English Church, Entebbe, Uganda	By Professor Beresford Pite.
House, "Gwysaney"	From a drawing by the late Mr. Arthur Baker.
Schools at Knowle, Bristol.....	The late Mr. J. D. Sedding, Architect.

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Heating by Hot Water.



LONDON is a smoky city. It is a strange delight to see the dome of St. Paul's clearly defined, even from Hungerford Bridge, a short mile away; there are many days on which it is impossible for the clearest-eyed to see across Oxford-street or the Strand; and this opacity of the air is almost wholly due to sheer waste of household coal. After all these years of Smoke Prevention Acts, it is idle to lay the whole blame on factory chimneys. Domestic fires are the chief offenders. It is not our purpose at present to consider whether the open fire-grate can be so constructed as to prevent the formation of the greater part of its smoke, although this would be an interesting topic. We are merely concerned to say that the number of such fires would be greatly reduced if a supplementary method of warming were installed in every house containing, say, more than eight or ten stoves. There are many days in spring and autumn when the single fire of such a heating apparatus would render the lighting of three or four open fires unnecessary, and the furnace of the heating apparatus would probably yield less smoke than any one of the open stoves.

The subject is of so much importance to the community as well as to the individual that we gladly welcome a new and

greatly enlarged edition of a work* dealing with it in a practical and comprehensive manner. It is not our custom to devote much space to reviews of new editions of books, but in this case an exception to the rule may well be made. The third edition differs so much from the second, both in form and matter, as to be almost a new work. The size of the page has been increased from 7½ in. by 5 in. to 9 in. by 6 in., and the number of pages from 220 to xvi., plus 344. In the second edition there were ninety-six illustrations and twenty-four chapters, in the third there are 142 illustrations and thirty-seven chapters. Much of the old matter has of course been brought forward into the third edition, but the figures given above show that much new matter has also been introduced.

The only alteration of any moment in the first chapter (on "The High-Pressure System") is in Table L, which is extended to give in greater detail the lengths of ¾-in. radiating pipes and the heating surface of the boiler coils required per 1,000 cubic ft. of air space for temperatures ranging from 55° to 300° Fahr. Chapter II. deals with a modification of the high-pressure system, in which a supply cistern with relief valve takes the place of the sealed expansion tube, and here, again, with the exception of one illustration and half a page of text, the matter remains as in the second edition. The chapter on bread-baking

* "Heating by Hot Water, Ventilation and Hot Water Supply." By Walter Jones, M.I.M.E. Third edition. London: Crosby Lockwood and Son. 1904.

by hot water or steam includes three new illustrations with accompanying descriptions, but still remains inadequate. Chapters IV., V., VI., and VII. are reproduced verbatim, but some additional memoranda of a simple arithmetical nature are inserted in Chapter V., and a new table on the conducting and radiating powers of various materials is substituted for the old table in Chapter VII. There is also a new paragraph of merely historical interest on thermometers. Keith's automatic air valve is the only novelty in the next chapter.

The subject of boilers is now discussed in two chapters (IX. and X.) instead of one, and it is in these that we find the first new matter of any real importance. Illustrations of some modern sectional boilers of cast-iron have been obtained from the American Radiator Company and the Beeston Foundry Company, and the new hints on "Selection of a Boiler" are good, but nothing is said about the advantage which some sectional boilers possess in being easily extended, when, in consequence of additions to the building and for any other reason, more heating surface is required. It is not uncommon to find in a building to which additions have been made one or more supplementary boilers used in conjunction with the original inextensible boiler; if a sectional boiler had been used in the first instance, new sections could have been added, and the result would have been more economical in fuel and labour and more satisfactory in

heating. Chapters XI., XII., and XIII. contain no new matter, and the old "rules" for ascertaining the velocity of air currents "in chimneys or ventilating flues" remain as before; they do not include any allowance for friction or bends, or take into consideration the effect of winds and other disturbing influences, and are, for all practical purposes, as unreliable as those formulas for calculating the amount of radiating surface for heating rooms, which the author criticises so severely. In Chapter XIV. the table giving the diameters of main pipes for various quantities of radiating surface has been altered, the quantities being less than in the older table; thus, for 1½-in. horizontal and 1-in. vertical mains the maximum radiating surface has been reduced from 100 sq. ft. to 80 sq. ft.; for 2-in. horizontal and 1½-in. vertical mains the radiating surface has been reduced from 600 sq. ft. to 300 sq. ft.; and for 3-in. horizontal and 2-in. vertical from 1,000 sq. ft. to 700 sq. ft. A table, copied from a report of Professor Ordway, has also been introduced, in which the relative efficiency of non-conducting materials is given; of the non-carbonising materials, loose calcined magnesia is accorded the first place, and "best slag wool" the second. Other tables relating to the areas and circumferences of circles have been extended, a new table giving the head and pressure of water inserted, and also a table giving the metrical equivalents of English sizes and weights of cast-iron pipes. The last contains a curious column of figures, stating the weight of pipes in kilogrammes per yard; to have been of service in foreign trade the equivalents of the weights in pounds per yard ought to have been given in kilogrammes per metre.

So far, it must be confessed, the third edition of Mr. Jones's book does not differ materially from the second, but the next two chapters, which together occupy forty-nine pages, now appear in the work for the first time. The first of the two is entitled "Radiation of pipe-surface as provided by different authorities for various buildings critically examined," and is an interesting piece of work, although it is questionable whether the criticism is always entirely fair. Hood's rule, for example, was not intended for extraordinary temperatures, but, as Mr. Jones himself points out on page 122, for the moderate temperatures required in "habitable rooms and public buildings" and also "for horticultural work," and it is therefore somewhat unfair to apply it for high temperatures from 90° to 120°. We hold no brief in favour of Hood's rule, which bears on the face of it every mark of empiricism and necessitates a good deal of guesswork on the part of the engineer when dealing with conditions in any way abnormal. Mr. Jones has done good service in pointing out the great discrepancies between the amounts of radiating surface obtained by this and other rules, and in comparing the theoretical results so obtained with the amounts of radiating surface which are required, as ascertained by careful tests, to heat a certain room to different degrees of temperature. In the comparative table (No. XIX.) the test results are not given, as the temperatures

of the external air and of the radiating pipes were not uniform. We presume that they are those numbered 14 to 20 in Table XXX., page 163, and if this is the case they certainly approximate closely to the theoretical results calculated according to Mr. Jones's new method and given in the first column of the comparative table.

Chapter XVI., which deals with the amount of "radiation or pipe surface" required in buildings of different kinds and for different temperatures, must be read in connexion with Chapter XV., as it is merely a continuation of the same subject. In passing, we may note that Chapter XVI. is a revised reprint of a paper read by Mr. Jones at a meeting of the Institution of Heating and Ventilating Engineers, and, as the author states in the preface, the members of the Institution "showed their appreciation of this work by awarding the first prize (silver medal) for the best paper read at their meetings during the year 1903." The chapter contains additional examples of the discrepant results obtained from some of the best-known formulas, and of the difference between these and the results obtained from tests. The recorded tests cannot be described as exhaustive; there are eight tests of horticultural buildings, one of a dining-room, six of a large office, one of a church, and two of drying-rooms. Of these the six tests of the room described on page 163 as an office, and on page 130 as "a room on the first floor over my offices," are the most interesting. The room had a capacity of 23,500 cubic ft., an exposed wall surface of 1,540 sq. ft. (p. 130, or 1,530 sq. ft. p. 163), and a glass surface of 370 sq. ft. Around this room seven rows of hot-water pipes were fixed, having a total surface of 1,278 sq. ft., and so arranged that any number of rows (from one to seven) could be in use. The first row had a radiating surface of 168 sq. ft., and each of the other rows a surface of 185 sq. ft. With the first row only in operation, the mean temperature of the water being 171° and the external temperature 20°, the temperature in the room was 44°; with two rows (mean temperature of water 167° and external temperature 20°) the internal temperature was 56°; with three rows (water 175°, external temperature 22°) the internal temperature was 68°; with four rows (water 167°, external temperature 16°) the internal temperature was only 70°; with five rows (water 161°, external temperature 30°) the internal temperature was 76°; with six rows (water 161° external temperature 42°) the internal temperature was 87°; with seven rows (water 157°, external temperature 48°) the internal temperature was 96°.

These results are very instructive, but, in order to render them more easy of apprehension, we have worked out the square feet of radiating surface per 1,000 cubic ft. of space in the room, and thus obtain the following figures:—7.1 sq. ft. of radiating surface per 1,000 cubic ft. gave an internal temperature of 44°, when the external was 20° (an increase of 24°), but 15 sq. ft. were required to give an internal temperature of 56° (an increase of 36°), and 23.7 sq. ft. to raise the temperature from 22° external to 68° internal (an increase of 46°). In

other words, one unit of pipe show difference of 24° between the internal and external temperature, but two were required to raise the internal temperature 12° higher, and three (with the water at a higher temperature to raise it an extra 10°. Four (30.7 sq. ft. per 1,000 cubic ft.) gave a difference between internal and external temperatures of 54° (namely, 70°—16°); five units (38.6 sq. ft. per 1,000 cubic ft.) a difference of 46° only (namely, 30°); six units (46.5 sq. ft. per 1,000 cubic ft.) a difference of 45° (87°—42°); seven units (54.3 sq. ft. per 1,000 cubic ft.) a difference of 48° (96°—48°). The tests and those of the two drying-rooms show clearly that every increase of internal temperature requires a greater increase in the amount of radiating surface, if the other conditions remain constant.

Mr. Jones has not, however, been content to give the results of his tests has based on them a new method of calculating the radiating surface required under different conditions. The method is somewhat complicated, and takes into consideration the cubical contents of the room to be heated, the exposed surface, and the area of glass, in addition to these, the allowance made for every increase of internal temperature. By means of elaborate tables and diagrams, the difficulty of calculation has been greatly simplified. With the tests on which Mr. Jones's method is based were sufficiently exhaustive to only be proved by experience, but the method seems to us to be without comparison in advance of any of the formulas now in general use, and to be one which the heating engineer cannot afford to ignore.

We can only briefly indicate the features in the remaining chapters. Chapter XVII. some hints are given on the defect known as "short circuiting," which is often found in systems containing a number of radiators. An interesting account of the method adopted for preventing draughts in the tower at Stonbridge is given in Chapter XVIII. A new and useful chapter, entitled "Mansions, Villas, or other Buildings," contains valuable information on the methods of connecting radiators. Chapter XXVI. on "Ventilation" also appears for the first time.

The last portion of the volume, which in the second edition, is devoted to water supply, and contains a new chapter in criticism of the ordinary method in which the heat is obtained from the kitchen range, and also additional notes on the subject of indirect heating means of double cylinders, or cylinders containing coils of pipes—a method which is particularly advantageous when the water is of such a nature as to deposit in the apparatus. Chapters XXXI. to XXXV. are also new, and bear the following titles:—"Ventilation Analyses," "Explosion of Theories to Have Been the Cause of Boiler Explosions," "Domestic Boiler Explosions," "Experiments with Red-hot Boilers and 'Safety Valves.'" We have repeatedly pointed out that nearly all boiler explosions are due to the circulation pipes being blocked with ice, and that by far the greater number of

have been prevented if proper safety valves had been fitted to the boilers, and Mr. Jones in these new chapters expresses the same opinion. As a sign of the times, it may be noted that the author is in favour of the metric system, and devotes the final chapter to the subject.

The misprints in the volume are not numerous, but we may point out that "390" on page 130 should be "370," and "1,530" on page 163 should be "1,540." "Verticles" on page 152 is an obvious printer's error, but the word "data" followed by a singular verb occurs so frequently that we are loath to lay all the blame in this case on the much-abused and long-suffering compositor.

We have pleasure in recommending this edition of Mr. Jones's book to architects as well as to heating engineers. It can scarcely fail to command a wide circulation.

NOTES.

At a time when the adoption of the metric system is persistently advocated, interest may certainly be taken in reasonable criticism of such proposals. An organisation has recently been formed, under the style of "The British Weights and Measures Association," with the primary object of combating the metre, and the secondary object of standardising and simplifying British Imperial weights and measures, so as to make them more useful than at present. A small pamphlet published by this association sets the adverse case in exceedingly simple terms, and the arguments raised are based on essentially practical considerations. For instance, it is pointed out that the metre is unsuitable for navigators and for those engaged in the textile industries. Also, that in navigation, in the measurement of shipping, and in the manufacture of cotton woollen, linen, jute, and hemp, British standards are practically universal, even in France and other strongholds of the metric system. Some striking estimates are given of the heavy cost to engineering firms of any radical change in the present Anglo-Saxon units, the outlay being computed at 100,000,000*l.* for British, and 200,000,000*l.* for American manufacturers. These figures may seem absurdly high, but they are supported by the testimony of prominent engineers in both countries, as well as by calculations made on behalf of the Franklin Institute of America. It ought not to be overlooked, however, that metric units are already much used by both British and American engineering firms, and that the change to the metric system could certainly not be made suddenly. In any event it is not likely to be made in many years, and in the meantime things but good can result from attempts to simplify the use of British weights and measures, and to abolish the unnecessary and meaningless variations now attending their application to many departments of commerce and industry.

ADVOCATES of the proposed barrage at Gravesend present glowing accounts of the advantages to be derived from the realisa-

tion of the scheme. According to Sir Thomas Brooke-Hitching, who recently delivered an address on the subject, the barrage would give London a clear water free from smell and pure enough for drinking in case of need. Launches, house-boats, and palatial steamers are among the concomitant delights he anticipates, and "London-on-the-Lake" is to become another Windermere or Geneva. Statements of such roseate hue are not altogether wise, and may tend to obscure the real merits of the project. As the width of the Thames will not be increased, its appearance will never resemble that of a lake, and, although the water in the enclosed river might probably be rendered purer and clearer, we should never want to use it for drinking purposes. For sanitary reasons houseboats would be distinctly undesirable, but to pleasure launches and steamboat services there could be no objection. One of the most valuable results to be obtained, however, would be the encouragement of commercial activity on the great natural highway. The establishment of permanent high-water level so as to facilitate the conduct of shipping business in the Port of London could alone justify the heavy expenditure involved by the Barrage Scheme. In some respects the proposal seems worthy of most serious consideration, but satisfactory answers must be given to several most important questions before approval could be given, even in principle, to the claims of the promoters.

ALL round the coast object lessons are to be found at the present moment demonstrating the relentless activity of the sea on the one hand, and the negligent sloth of man on the other. We have already commented upon the case of the Dee embankment, which, since our recent "Note" was written, has been almost destroyed and will entirely disappear before long. At one time the expenditure of a few pounds would have saved the embankment if the parties concerned could only have been reasonable. As things now stand the landowners have lost their property and the railway company are committed to an outlay that will probably amount to many thousands of pounds. In the Isle of Wight, again, the authorities at Yarmouth continue to play with danger in the hope of avoiding necessary expenditure. We recently pointed out that there was imminent danger of an incursion by the sea down the Yar valley. Since then a local inquiry has confirmed previous statements as to the serious disaster threatening the western portion of the island, and it is by no means improbable that the next severe south-westerly gale may sweep away the only barrier remaining between the sea and the river Yar. In spite of this urgent situation nothing is being done in the way of protective works, as the local council decline to move unless with the co-operation of other councils and private owners. Sheerness is another place threatened by the sea, from which it is protected merely by sea-walls. Two years ago the defences were damaged on the most exposed part of the foreshore, and although the cost of repair was estimated at less than 200*l.*

the Urban Council declined to sanction the necessary expenditure. About a year afterwards the defences were so much injured by heavy gales that the estimated cost of reconstruction involved no less a sum than 2,000*l.*, which has now to be provided perforce by the dilatory and pennywise authorities. Other examples of the kind could be quoted, but we have said enough to demonstrate the spine folly of some bodies upon whom devolves the defence of the coast line.

A CORRESPONDENT signing "F. R. S." has made a plea in the *Times* against the ruin of Philæ from the proposed further raising of the Nile, and is answered by Sir W. H. Preece in a letter which shows more candidly than usual the typical attitude of the engineering mind towards questions of the preservation of architectural beauty and of monuments of archæology. All the talk against the heightening of the dam is, in Sir W. Preece's view, "sentimental rot." It is not often that we have it put in such plain terms, but that is the general mental attitude of engineers in respect of all accusations that in the course of their schemes they are destroying objects of beauty in nature or in art; and it is well to have this frank and typical confession kept in mind. According to Sir W. Preece, the destruction of the Philæ temples matters nothing because they are only Ptolemaic. If Karnac stood in the way of an engineering enterprise, we have no doubt some argument would be found to prove that Karnac was of no real value.

THOUSANDS of Londoners daily subject themselves to the depressing and noxious atmosphere that flows along the tunnels and through the carriages of deep-level electric railways. Fortunately for them, the period of immersion in this poisonous bath is of short duration, and means of escape occur at frequent intervals. Hence the only immediate effect in those of strong constitution is a temporary reduction of vital energy, which appears to be cheerfully suffered in return for the benefit of rapid transport from place to place. In long railway tunnels where steam locomotives are employed, far greater risks await the adventurous traveller. Only a few days ago five railway employees, including members of a rescue party, lost their lives in the well-known St. Clair tunnel between Canada and the United States, owing to the breakdown of a goods train amid the deadly fumes with which the tunnel is always filled. What would happen if a passenger train were disabled in similar fashion is too terrible for contemplation, but it is well that attention should be called to the grave risks attending railway journeys below the surface of the earth. The St. Clair tunnel is only 2½ miles long including the approaches, a short distance as compared with some modern European tunnels. Discomfort is experienced in the latter, even during the fairly rapid passage of passenger trains, and the result of any stoppage would be truly disastrous. This consideration alone is

The Thames Barrage.

sufficient to negative any lingering feeling in favour of the Channel tunnel, the construction of which has been discussed in France since the happy restoration of cordial relations between the two countries concerned.

Trade Drawbacks. IN the list of barriers to business enumerated by the President of the South Staffordshire Iron and Steel Institute at Dudley on Saturday last the subject of high railway rates occupied a prominent place. This matter is already engaging the attention of the Government, owing to the persistent complaints made by agriculturists of undue preference in favour of foreign produce. Figures have been quoted in support of their contention which, in view of the Act called forth by a similar agitation a few years back, seem almost incredible. At the Dudley meeting it was stated that the unfair advantages which railway companies offered to our foreign competitors tended more to create unfair competition than was generally known. If this be so, the sooner the Government are put in possession of the facts the better for all the industries concerned. The sidings owners received active parliamentary sympathy this last session, and effected a satisfactory compromise with the railway companies with respect to some of their grievances. Unfortunately for themselves, the South Staffordshire manufacturers labour under the disadvantage of being situated very far from the seaboard, and the incidence of railway carriage may quite conceivably tend to the removal of works from that district, even in the absence of any discrimination in favour of foreign competitors. We were certainly under the impression that "undue preference" had been effectively dealt with by legislation; but such abuses have a tendency to creep in again. If they are found still to exist, the law should be strengthened, for relief in the direction of reductions in rates will otherwise be found difficult, if not impossible, of attainment. Better results may be looked for from a more thorough utilisation of canal transport—a subject we have recently dealt with—for just now every railway manager has "economy" in large letters in the forefront of his programme.

The Mersey Railway. THE paper on the electrification of the Mersey Railway, by Mr. H. L. Kirker, which has just been published in the *Journal of the Institution of Electrical Engineers*, is of considerable interest to engineers at the present time. The whole work of electrifying the line was completed without interrupting the ordinary traffic, and an instantaneous change over from steam to electric working was made. The speed of the trains on the line is increased from fifteen to twenty miles an hour, and the train mileage per week has been increased from 6,000 to 15,000, a three-minute schedule being maintained all through the day. In order to avoid the loss incident on running lengthy trains during the times when traffic is light, "multiple control" has been adopted. On this system the electric motors are distributed amongst several cars of the train, and electric locomotives

are used only on special occasions: Instead of having two controllers, one at each end of the train, to regulate the total current required, a number of smaller controllers are put on several of the motor cars, and they can be operated from several points on the train by means of an auxiliary control system which is worked by a small battery. The change to electricity has effected a very considerable saving in the cost of ventilating the tunnel. With steam the average cost was nearly 5,000*l.* per annum, while with electricity the total cost is less than 400*l.* In electrifying the line great difficulty was experienced in retaining workmen, as the work on the permanent way was of a highly disagreeable nature owing to the vitiated atmosphere. The actual working hours were from 12.30 a.m. to 4.30 a.m., except on Sundays, when the men worked till noon. As the greater part of the cable work was in the ventilation headings, where, in addition to the smoke, there was a seventeen-years accumulation of soot to contend with, the working conditions were very trying. One highly satisfactory feature in connexion with the change over to electric working is that of the 250 men employed in operating the trains over 90 per cent. are old steam employes. This speaks well for the simplicity of electric traction.

The Sandby Bequests. MR. WILLIAM ARNOLD SANDBY, who died in last May at an advanced age, leaving numerous bequests to the Council of the Royal Academy and to public Art collections in this country, was a nephew of Thomas and Paul Sandby, natives of Nottingham, and foundation members of the Royal Academy. Thomas, the elder brother, was first Professor of Architecture to that body, from 1768 until his death in 1798. Many of his architectural drawings, in water-colour, were then sold, and are preserved in Windsor Castle, the Soane Museum, and the National Collections. When twenty-two years old he was, in 1743, appointed military draughtsman to the staff in Scotland, and, having accompanied in that capacity the Duke of Cumberland in Flanders, was made deputy-ranger of Windsor Forest; during his fifty-two years' tenure of that office he effected many improvements in the park, and laid out the lake of Virginia Water. Paul Sandby, one of the earliest English artists who engraved in aquatint, first found regular employment in the drawing-office at the Tower of London. In 1748, being then twenty-three years of age, he joined the staff for making a survey of the Scottish Highlands. His prints and tinted drawings of scenery in Scotland and Wales, and a set of seventy etchings of the Windsor and Eton country, brought him great reputation. In 1778 he published "The 'Virtuoso's' Museum," a series of 150 engravings by him of views in England and Wales. He was appointed drawing-master to King George III's children, and from 1768 to his decease in 1809 was chief instructor of drawing at the Royal Military Academy, Woolwich. Paul Sandby's popular "tinted drawings" were done with a reed-pen, the tints being obtained with thin translucent washes. Mr. W. A.

Sandby bequeathes a capital sum of 1,000*l.* to the Royal Academy for annual "Sandby Gift," in his undying memory, to be awarded to an architect and a landscape painter, alternately, or to the families of such artists under certain conditions. His other bequests comprise his MS. copy (to the Academy) of Thomas Sandby's lectures on Architecture, autograph letters (to the British Museum) written by his two uncles, and specified examples of their drawings to the Universities of Oxford and Cambridge, the National Gallery of Scotland, the City of London Art Gallery, and Art Galleries of Manchester, Liverpool, Glasgow, and other provincial cities.

The Autumn Salon at Paris. THE "Salon d'Automne" which has succeeded in emerging from the basement of the Petit Palais, and secured footing in the main galleries of the Grand Palais, is to a great extent consecrated (as might have been expected) to Impressionist School. It may be said once that good pictures are few, and good taste (on the part of the public) somewhat outraged by the fantastic character of many of the works. It may make an exception in regard to Carrière, whose exhibits have really qualities in spite of his prejudicial favour of a melancholy monochromic colouring and an effacement of outline. M. Besnard on this occasion has abstained from exhibiting, but his wife and daughter have taken part in exhibition, the general arrangement of which is carried out; but to place in juxtaposition to the room consecrated to drawings of Puvis de Chavannes works as those of MM. Odilon Redon, Cezanne, and Toulouse Lautrec, is a poor compliment to pay to the memory of a great artist. Amongst architectural designs the façades of houses by M. Phmet, and the costumes by M. Sézille, are worth mention. Sculpture is worse than mediocre; short, this attempt at a third Salon, which no one wanted, may have a healthful result of disgusting the public with the eccentricities which a clique of dealers endeavour to force upon them, to the prejudice of the true art.

Mr. C. W. Furse. THE death, at so early an age, of Mr. C. W. Furse, a great loss to English art, is not only for what he had achieved, perhaps even more for what he might have been expected to achieve. He has always shown original style in his treatment of portraits, but he would not have been only feeling his way in the last year or two, when his large picture of "The Return from the Regiment" suddenly gave an entirely new idea of the breadth and power of style which were within his grasp; and his beautiful "Diana of the Uplands," in this year, Academy, showed again a new power of movement, and life, and energy, and all who saw it to feel that henceforth Furse's picture would be among the pictures of interest in each Academy exhibition. It is sad indeed to think of that joyful vision of life and health, and of an author cut off in the full vigour of his artistic power and promise.

again drawn to the publication of the Sketch Book, which represented the work of some of the finest architectural draughtsmen of the day, and, he believed, needed only to be better known to secure much wider support. In this year, however, by far the most important item concerned their capital account in respect of the new premises which they now occupied. Very generous donations had been made by members and friends, for which the Committee was most grateful. The Council of the Institute of Architects had most liberally voted 500*l.*, and several manufacturers and merchants had contributed in kind, the total representing 5,633*l.* in all, but their indebtedness to the building contractors still amounted to some 4,000*l.*, and a further sum of about 1,000*l.* was requisite to complete the reinstatement of the museum and efficiently equip the classrooms, reading-room, and library. Towards this 1,000*l.* had been promised by a valued friend conditionally upon the balance being secured during this session, and Mr. Aston Webb, R.A., another tried friend, had offered 500*l.*, in addition to his former donation, upon similar terms. The Architectural Association was doing work for its members and students which was increasingly recognised and appreciated, and, in addition to this, it was pledged to maintain the Royal Architectural Museum for the public benefit. The Committee, therefore, confidently hoped that a generous response would follow the publication of a statement of the present financial circumstances from that ever-widening section of the community which was interested in the advancement of art generally, and of national architecture in particular.

The report and balance-sheet was then adopted.

The President announced the following further donations to the New Premises Fund:—Messrs. W. A. Aickman, 5*l.* 5*s.*; A. S. Gover, 2*l.* 12*s.* 6*d.*; T. L. Dale, 1*l.* 1*s.*; and T. R. Hooper, 1*l.* 1*s.*

Mr. L. Ambler, Hon. Sec., announced that the Conversazione would be held on Thursday, October 27, at 8 p.m., at 18, Tufon-street.

Photography as Applied to Architecture.

Mr. E. Dockree then read the following paper:—

If I commence my paper this evening with a few remarks on the ethics of "Photography as Applied to Architecture," or, in other words, architectural photography, I must at once disclaim any intention of raising that wearisome and unprofitable controversy over the respective merits of sketching and photography as a means of depicting buildings. I recognise that very exhaustive claims have been made on both sides—claims not supported by any substantial basis of fact; and while my personal sympathies naturally tend towards work with a camera, I am quite willing to grant that the use of the pencil by the architect and student is a very necessary and proper thing.

But architectural photography has its field. The late John Ruskin, no enthusiast concerning photography in general, said "it was the foremost means of translation or reproduction in a graphic form of architecture." I do not affect a belief that by this utterance the great art critic excluded all other methods of depiction; his own exquisite drawings of architecture would at once dispel such a claim. But I do believe that by this utterance he recognised the supreme claim of the architectural photograph—its impersonality. A drawing must necessarily be tinged with the individuality and perception, or want of perception, of its author; in short, you do not receive an impression of the building through your own eyes, but through the eyes of the artist—may, it is but an impression of his impression. So that, whatever pleasure you derive from the drawing as a drawing, you do not necessarily receive from it the impression of the building that would result from a sight of it in the substance. Some medium is therefore required for affording an impersonal depiction of a building from which each beholder can draw his own deductions and impressions. Such an impersonal basis is afforded by the photograph, which I claim is the only effectual means for the exhibition of architecture; and by exhibition I not only mean a public display of architectural views, but also their publication in books and magazines, or any other method intended to appeal directly to the criticism and judgment of the individual. The first case is even more important than the second, because if ever an

impersonal basis is needed, it is required by a judge who has to decide the merits, not of drawings or photographs, but the buildings depicted in them. That I am not alone in my contention is shown by the efforts that have been and are still being made by some of the leading architects to obtain a revision of the Royal Academy rules with regard to architectural exhibits; a revision that would permit architects to show their work by means of photographs, geometrical drawings and models, as well as, or instead of, perspective drawings, to which they are at present practically restricted. My claim for the photograph as the best means of exhibiting a building will doubtless be met by two objections:—

(1) That the photographs can be "faked."
(2) That buildings seen in photographs are frequently distorted and are not truly represented.

Both these objections must be admitted; in regard to the first, I might rest content to say, so can drawings. One has only to study perspectives at the Royal Academy for this fact to be self-evident. But if absolutely sharp, clear detail be insisted upon in a photograph, it will be exceedingly difficult, if not impossible, to fake it without detection. Only fuzziness or impressionism will disguise the efforts of manipulation. And architectural photographs in general cannot be too sharp. In regard to the second objection, the fault lies entirely with the operator; if you see a distorted building or one in impossible perspective, blame not the science but the photographer.

For the benefit of architects employing professional photographers, I should mention that many of the monstrosities in architectural photography that one sees are due entirely to the architect, whose orders the photographer is naturally obliged to carry out, however much they go against his better judgment. The most common causes of failure are:—

(1) The architect desires to get too much in one plate; he wants "to look over his head" or "round a corner"—in short, tries to achieve the impossible—in which amiable endeavour the photographer collaborates. Occasionally, for a special purpose, it may be necessary to take a somewhat distorted view. For instance, one of the photographs of Westminster Cathedral which is hung on the wall to-night is a very sharp perspective of the campanile from the roof of the nave. This photograph, which took me three hours to focus and get into position, was specially asked for by Professor Lethaby, who selected all the points of view. In general, the photographer should resist a request for a view he knows will appear distorted.

(2) The operator receives instructions to do "the best he can" (a favourite form of request), and with some operators the best does not amount to much. In this case the photographer goes blindly to work, never pointing out drawbacks or defects (from a photographic standpoint) in the views suggested or offering a workable alternative.

I am tempted to add a third reason—a want of knowledge on the part of the operator of either the science of optics or the laws of perspective, or both.

I do not wish to pose as an authority on architecture; there are too many already; but in more than one instance I have succeeded in bringing the architect round to a point of view widely differing from his original idea, although still retaining the same angle of the subject that he required to be taken.

Some subjects are quite impossible to render in a pleasing way, and unless they are required for litigation purposes, I strongly urge that they be left alone.

Concerning size, the larger the photograph of an architectural subject can be made, the better in every respect: the details and the proportions of the structure are shown to a greater advantage. A small picture may be a gem of photography in its way, but you instinctively feel you would like to see it done larger. Of course, you can enlarge by means of one of various apparatus on the market, but why make two hits at a cherry? The resulting picture lacks that "quality" and "vim" only to be obtained by working direct. An enlarged negative is another alternative, but that requires a skill and power of manipulation far beyond the average amateur, who only requires one or two prints of the subject he is interested in.

Again, small plates are "small" in price and tend to carelessness and slipshod work; whereas

a large plate and its after manipulations enable you to walk round and study your subject, consider every standpoint—the final one selected only after mature deliberation.

I would like, while still speaking generally, to say a word about artificial light. For architectural work artificial light should never be resorted to if it can be avoided. Though an interior appear absolutely dark to the naked eye, there are always rays sufficient to act upon a sensitive plate if time be given. Thus, my friend of the Chester crypt had to be focussed by torch, consisting of a newspaper rolled up and held a certain distance in front of the camera. The plate was exposed five hours, and a slide of the result only you will see later. Such prolonged exposures are not always possible, and one is frequently forced to employ some sort of artificial light. Though I have never employed it, I believe acetylene gaslight is the best for photographic purposes, as the spectrum of this light closely approximates to that of the sun, and have invariably used electric arc lamps for photographing the auditoriums of theatres and other dark interiors. In the case of the Hallows Church, Lombard-street, the very interior of which I photographed in February last year, the building was wired for electric light and electric lamps could not be utilised. I therefore employed six lime boxes, using the oxy-hydrogen light, the gas being contained in polyethylene cylinders. The resulting photographs are on the walls this evening. One light I was not to use for architectural purposes, and is the one most commonly resorted to—light magnesium. Its use results in a glare over the objects nearest to the camera, and the elimination of detail in the foreground, so that delicate undercut carvings look as flat and formless as a stencil pattern on a wall.

Unfailing patience and effort are required to obtain success in architectural photography. One must be prepared to work at it all hours of the day and night. I have secured excellent negatives by exposing plates in subdued light between 3 a.m. and 7 a.m., as the fascination of the work gets a firmer grip of the worker, so the various difficulties are overcome and in the end practically disappear, the intervening stages serving to encourage the earnest enthusiast. There are obstacles to be overcome undoubtedly, but none of a magnitude as cannot be surmounted by careful application.

Apparatus.

In dealing with my remarks on photographic apparatus and photographic processes, I include in this paper for the benefit of those who are or intend to become architectural photographers, I have endeavoured to eliminate as far as possible technicalities or technical terms, hoping that my lay hearers may understand and join in the discussion which hope will arise.

The Camera.

Bearing in mind my remarks as to size, I do not recommend anything less than a whole plate camera. Personally, I use a 12 by 10, and a 15 by 12 if I could get about with it and in a comfortable manner. A camera should possess double extension; the "front" and "back" should be capable of being adjusted by means of a pinion and worm-work, the bellows slightly tapering; and the "front" carrying the lens should have a "rising movement" and, better still, a "sliding movement" in addition. All up-to-date cameras have a "swing-back" capable of two movements, "to" and "from" the lens, a "reversing back" to carry the dark slide that oblong and upright pictures can be obtained. Some workers find fault with "turntable"; they say that "focussing" is difficult in a dark interior—what light there coming up through the same from the ground floor and detracting from the visibility of the image on the "focussing screen." This is so, but personally I have found no inconvenience of any moment up to the present.

To my mind the turntable has advantages over the solid base board; it reduces the weight of the camera, it facilitates your movement in finding the desired view, and gives rigidity to the whole apparatus, the latter a very important feature when working with long focal and in exposed positions. The turntable, or tripod used with the turntable

ould be folding, with a sliding leg—two or ee-fold, if of the right weight, is immaterial; camera and tripod when set up for use ould not exceed 5 ft. 6 in. to 5 ft. 10 in. ght, this being an average sight-line. A slow ving spirit-level, circular in shape, should eed on the "base board" of the camera just he side of the front; on the front itself at e side of a "plumb index" should be eed, and another one on the side of the wing-back." These three working together urately place beyond dispute the absolute ticality of the resulting photograph.

Lenses.

he next thing to be considered, and certainly most important one concerning architecture, he lens or lenses. One lens will not do rthing required of it; and, before deciding at to get, I would strongly urge the enthusiast consult someone well versed in the matter. f, if the pocket will allow, to purchase the t make possible. Then, should your results not satisfactory, blame yourself and not the s. I hold no retainer, so cannot advertise, whatever make is selected let it be a lens ng no wider angle than 65° for an interior ect, whereas 60° to 65° is a very pleasing ge for exteriors of buildings.

I quote "focal lengths" of lenses it will ibly only tend to confuse, so I will merely e that lenses for architectural work must of the rectilinear type and possess great ering power and marginal definition; those the genuine "anastigmatic" series are hately the finest procurable for the purpose. an afraid I must depart from my original ntion to avoid "technical terms," but e n alternative in giving the following eiculars. Where the purse will allow, I ngly recommend the earnest worker to ure a "battery" of lenses for his use; instance, for a whole-plate camera, a 6½-in., and 12-in. focal lengths; for a 10 by 8 era, an 8-in., 11-in. and 14-in. focal lengths; for a 12 by 10 camera, a 10-in., 13-in. and n. focal lengths. And to the last-named I dd add an 8½-in. lens.

Focussing.

he apparatus complete, the first operation r the selection of your view is the "focussing," e screen upon which this is effected should ruled into small squares, say, of an inch; will facilitate the worker in composing picture. In "focussing" get your subject sharp as you can, roughly so at first; ee r vertical lines are vertical, and not, as sometimes sees, converging to meet at some t. Your "uprights" not being true, the era must be generally "levelled" and the wing-back "manipulated until the said lines vertical, the levels all working true to e each; your picture should then be dead "up-t." Now re-focus, fixing upon some object way between the camera and the middle your subject; note the appearance of the e at the top, bottom, and sides of your en, using the lens's stops to bring the whole y into general sharpness—and in archi- tural work I have already said it cannot be sharp.

Exposure.

he knowledge of the exposure to be n is only gained by experience; and there e no fixed rule, subjects, light, and shade ing to an enormous degree. But bear n mind—always give plenty; look after shadows, the "high lights" will look themselves. Better "over-exposure" than nder-exposure"; the former can be modified evelopment, but no amount of development ve detail which through "under-ex- ure" is not in the plate. Bear in mind e each consecutive stop requires twice as h exposure as the one immediately pre- ging it.

Plates.

those having a medium rapidity will be d the most serviceable, satisfactory, and y to work. Some workers like one e of plate, others prefer another; personally, ink the Imperial Company's or Elliott's et give all that is required of them; but ry plate used must be "backed." The eence in the resulting picture obtained a "backed" and an "unbacked plate" ost marked; in fact, in some cases, especially e windows assert themselves in an in- or, a "backed" plate is an absolute nec- s, otherwise "halation," the beggar of

photography, will be so evident as to quite nar the picture, though everything else is quite satisfactory.

Developer.

One composed of pyro, in combination with potash or soda as the accelerator, is, to my idea, the best for the class of work under consideration. It yields, if properly adjusted in its components, a negative soft but vigorous, the class best suited for printing in either "silver" or "platinum." In development the watch-words should be "Detail first, density afterwards," not the reverse. To obtain the correct gradation, keep your pyro down to a minimum to start with; it can easily be increased as development proceeds.

All detail out and the desired stage of density reached, rinse the negative well and fix in the usual manner—say, for ten to fifteen minutes—in hypo 1 oz. to each 4 oz. of water; remove, well wash under running water for forty minutes to an hour, drain, and stand to dry in a place free from dust and draught.

The negative now obtained, when dried should be carefully examined, and the various defects, such as pin-holes, etc., remedied, and the shadows, if too pronounced, should be strengthened by one of many devices, such as papring, etc., on the glass side.

Prints.

I have no doubt that the numerous printing processes are known to you; each one has his own particular idea in that direction. But a note on prints intended for reproduction by the press may not be amiss.

A print to give the finest block for reproduction is the "silver print." By that I mean that done on one of the various P.O.P. papers and toned with gold. I prefer that "toning" which includes the "sulphocyanide of ammonium"; the range of tones and the latitude it gives is excellent. The "process worker"—by that I mean the "block maker"—likes a good, plucky "blue-black" print full of "vim" and "contrast"; it yields a block far superior to any other class of print.

In bad or dull weather one of the numerous "gas-light papers" must be employed; no toning is required, the image being developed by one of the various "Metol" formula.

For framing and keeping for show purposes there is no process equal to the "carbon" or "platinum," but suitable negatives are required to give the finest results—any class of negative will not do; for carbon a strong, plucky negative, and for platinum a soft but vigorous one.

My paper is now ended. I am aware that on many points I have only been able to touch briefly; but I shall be most happy to answer any questions or explain any matters arising out of the subject. I will now submit for your inspection some of my slides from negatives by Mr. Ashton and myself. They comprise views of buildings in England, Italy, France, etc., and will, I hope, show what can be done in the way of architectural photography without either "faking" or "distortion."

[At the conclusion of his paper Mr. Dockree exhibited 166 slides, selected out of over 3,000 made by him from negatives taken by himself and Mr. Ashton. They illustrated some of the possibilities of architectural photography and included also sculpture and metal-work subjects. The views were splendid examples of the photographer's art, many of them, as explained by Mr. Dockree, being taken under very difficult circumstances.]

Mr. A. C. Bulver Booth proposed a bearty vote of thanks to Mr. Dockree for the very interesting paper, and also for the splendid photographs. What struck one so very much was the wonderful way in which the different substances of the object photographed were rendered. One could see at once whether it was brasswork, stone, or bronze, and so on in every case; but beyond that they could see the texture and the material in the way of marbles. The views did not want much explanation, for one saw at once what the substance photographed was. Perhaps what were especially interesting to them were the photographs of interiors. Mr. Dockree had spoken of the photographing of interiors where there was little or no light, and he had an instance of that early this year, when a friend of his and a member of the Association—Mr. Hemmings, who was a very enthusiastic photographer—went to Abbots Langley. The church there was very dark, and, in addition, it was a dull day; but Mr. Hemmings wanted to photograph

a Jacobean pulpit. They got there about a quarter to one and obtained the keys of the church, and, having set up the camera, left it whilst they went to lunch. They returned in an hour and a quarter, but the light was so bad that they could see none of the detail of the pulpit with the naked eye. When, however, the photograph was developed the amount of detail to be seen was wonderful; one would have supposed that the interior of the church was flooded with sunlight. He was not sufficiently acquainted with the art of photography to know how that came about, but certainly the print gave the appearance of sunlight, for, instead of having a dull interior almost black, it appeared to be almost in sunlight.

Mr. Dockree: That shows its truthfulness. That opens up another question as to whether photography can lie. It does not.

Mr. Booth said it was certainly a revelation to him to see what could be done in the way of the details of an object in a dark place being reproduced by the camera.

Mr. C. H. Freeman, in seconding the motion, said that one remarkable thing about Mr. Dockree's work was the amount of detail he managed to get in the shadows. Mr. Dockree told them to do so, but he really did not give much information as to how it was done, and that was the sort of thing many of them would like to know. Another thing which struck him was the reference to long exposures, which was a thing many people seem to be very much afraid of. He himself had never given such a long exposure as five hours, but he had given an hour. He had been photographing interiors when people had asked him how long an exposure he was giving, and when he told them about an hour they seemed quite alarmed at the idea of giving more than about ten minutes' exposure. He remembered seeing some photographs taken by Mr. Sandell, who said he had left the camera up all day and night, and there was no trace of over-exposure on his plates. A little while ago these plates seemed to be recommended a great deal for architectural work, but Mr. Dockree had not mentioned them in the course of his paper.

Mr. Ambler read a letter from Mr. S. P. Bolas, who had been invited to attend the meeting. Mr. Bolas said he had read an advanced proof of Mr. Dockree's paper, and sent a number of photographs of Westminster Abbey for inspection. He apologised for his inability, through illness, to be present, and said the whole of the views of the Abbey were made from points selected by his firm; but the main difficulty was the general view, which took them three-quarters of an hour from the time they arrived in the street and got to the top of the roof and back again. The detail of the campanile was a telephoto, and the interiors were troublesome and tedious. The building was dark, but even then the longest exposure did not exceed one and a half hours. Again, they found that the most handy flashlight was magnesium, but the lamps one bought in the shops were absolutely useless. The one they used was made to their own design, and was got out of a solid block of metal. In light interiors, etc., they frequently only required a puff or two to illuminate dark corners and get their correct shadows. As regarded the focal length of the lens, everyone knew the 18° was most satisfactory to use, but ninety-nine times in a hundred one had to use a 9°, which covered an angle of about 120°.

The Chairman said he was sure they had all had a most enjoyable evening, and on the wings of his camera Mr. Dockree had taken them to some of the most beautiful places in Europe. They could heartily congratulate him on the excellent series of modern work that he had shown that night. Apart from anything else, he thought the clearness and brilliancy of the detail and the selection of the points of view in all of them were worthy of high commendation. If this was the result of architects telling Mr. Dockree "to do the best" he could, they had not very much to complain about. Mr. Dockree had touched upon a point which was a very debatable one—whether we should illustrate our work by photographs or drawings. He thought that executed work was better shown by photographs than by drawings. Of course, there was no comparison between the two—they were so absolutely distinct—and Mr. Dockree was very wise in not pitting one against the other, as so many people did. From his own personal point of view, he must admit that a great part of the paper was beyond him. It was an excellent paper for those who took

photographs, but, so far as the technical part was concerned, he was rather lost. He felt that there was no doubt that the perfection which photography had reached in the last ten or twenty years, and to the way in which architectural subjects had been treated, was to be attributed in no small degree the interest which the public took nowadays in architecture. The illustrated papers gave photographs of country and town houses in a way that fifteen or twenty years ago was absolutely unheard of, and to the professional photographers a debt of gratitude was owing for the way they had popularised architecture amongst the people. He had never seen a better collection of lantern slides than those shown, and the way in which absolutely black interiors had come out was simply marvellous. With the vote of thanks he would also couple the name of Mr. Ashton, who had worked the lantern.

The motion having been carried,

Mr. Dockree, in reply, said the question was whether he had succeeded in persuading them of the impersonality of photograph? That was the point—that it could not be faked, or, if it was faked, it was open to detection. That was really the purport of his paper—as to whether photography was impersonal. Nobody was more sorry than himself that Mr. Bolas was not present, for there was no lens made which would take 120°. He was asked how they got the details, and he could only say that it all came back to the one point—detail first, density afterwards. As to the question of why the pulpit came out, it was one of those things they could not understand. The plate itself was more sensitive than the eye; if they could get something to focus and sufficient exposure, and proper development, they would find something there. He was disappointed that the paper had not produced some discussion. He came down there to learn something about architecture and to teach something about photography, but he was afraid they had both failed. If he could help anyone out of a difficulty, he would be glad to.

A member remarked that, whilst the slides were being shown, a gentleman asked how the colouring was produced, and Mr. Dockree did not answer.

Mr. Dockree said that had nothing to do with the negative. He had not come to teach slide work, but some day, when the Association had a strong body of photographers, and wanted to learn something about slide work, then he would be glad to touch upon that.

The Chairman announced that the next meeting would be held on November 11, when Mr. Henman would read a paper on "Ventilation."

THE ARCHITECTURAL ASSOCIATION: VISIT TO CHARING CROSS HOSPITAL.

AN unusual opportunity of viewing an important London hospital induced the Committee of the Architectural Association to arrange a special Saturday afternoon visit on the 15th inst., and a very large attendance of members, combined with what proved to be a deeply interesting subject, more than justified the experiment.

Charing Cross Hospital, like kindred Metropolitan institutions, has found it necessary to enlarge its accommodation to cope with increasing demands; but instead of removing to a more spacious site, the Governors elected to acquire surrounding property, in order to extend existing premises, and it was of these recently completed additions that an inspection was made, under the guidance of the architect, Mr. A. Saxon Snell. In an early stage of the new work we gave a historical "note" of the site,* but, in order to convey a more comprehensive idea of the completed scheme, it may be interesting to recall that the hospital now occupies almost the whole of the triangular plot bordered by Chandos-street, Agar-street, and King William-street. Amongst many buildings cleared away was Toole's Theatre, latterly the home of the Beef Steak Club, at which time the hospital stood principally upon the Agar-street front. The new buildings on the Chandos-street, or north, front chiefly consist of a large nurses' home, whilst the old and new blocks fronting the remaining two thoroughfares, comprise wards, administrative and other hospital departments. The central part of the site is occupied by a large tower, containing the main

staircase, automatic electric lifts, chimney shaft, and isolation wards. Cross ventilated bridges give access to the respective floors of the surrounding blocks, which are again connected with one another by iron stairs and landings at the ends of the wards, thus producing a ready means of escape from fire.

The greater part of the basement accommodates the out-patients' department, conveniently arranged and satisfactorily lighted. More accident cases are treated here than at any other London hospital, and ample provision is now made for their reception and rapid disposal. The casualty department is entered at the south-east angle facing Strand, and is so sited that a cab can draw up at the doors of two top-lighted theatres, which are in close touch with the surgeons' consulting rooms, and with the central stairs and lifts. Baths of various kinds are also found on this floor, the practical details of which are well considered.

The ground floor, generally speaking, consists of staff quarters and administrative departments. The next three floors in the new, and four stories in the old, building contain wards which are planned very much in the usual way, with scullery and small ward in the middle and sanitary annexes at each end. The maximum number of beds is 265, of which 100 are located in the extension. On the fourth floor of the new building the operating and lecture theatres, clinical laboratory and X-ray rooms are well placed. The fittings throughout these, and, indeed, in all departments, are of tank, very suitably designed. In the operating theatre the students are located in a balcony surrounding the working table, and yet are in closer touch with the actual operation, leaving the floor space clear for surgeons and assistants. This is the suggestion of Mr. Stanley Boyd, one of the chief surgeons of the institution.

In the matter of details very great thought and attention has been given, and, in many instances, departure made from the usual forms of construction. Foremost of these is the ward floors, where a boarded finish is dispensed with, and a linoleum laid direct upon the concrete. The windows on the King William-street front are glazed with an opaque material, set in a series of louvred casements, controlled and regulated by a simple mechanical contrivance, specially devised by the architect to prevent overlooking from the windows on the opposite side of the street. The ventilation, although occasionally in the nature of experiment, is on simple, natural lines; no mechanical system is provided.

It was generally observed that, considering the drawbacks of such a site, the architect has produced a very successful scheme, making full use of the limited area at disposal. The general information which he willingly gave to the members, and the opportunity of studying the hospital buildings, were much appreciated.

MANCHESTER ARCHITECTURAL SOCIETY.

ON Thursday, the 13th inst., Mr. J. W. Beaumont, the President of the Manchester Architectural Society, delivered an address at the opening of the present session. A considerable portion of the address was occupied with points of local interest; but we print those portions of the address which referred to subjects of more general interest. In the course of his address, referring to the possibility of interesting persons outside the profession, Mr. Beaumont said:

"Many advantages are offered, as I said in my address last year, to members joining our Society, but I think it is well worth considering whether we could not make our Society still more useful by extending its advantages and trying to interest those who although not members of a profession, yet take some interest in our art. The more the public are induced to take some interest in architecture, the better, I am convinced, it will be for our profession, and I do not see why we should not invite men outside our members to attend our meetings when papers are read. Judging by the success which has attended Professor Capper's excellent public lectures on architecture at Owens College, I feel sure that if a really interesting series of papers could be arranged for our sessional meetings, or we could organise a series of lectures on architecture similar to the 'Addresses to Craftsmen' being given by Mr.

Glazier at the Municipal School of Art, people invited to attend them, we should be doing a useful work. It is to societies like this that the public should be led to look for information in architecture and the allied arts, especially in provincial towns where facilities for study of architecture are not easily obtained elsewhere; and if we could offer them means for the study of these arts I believe these means would be taken advantage of, and the public would be led to an appreciation of our profession. It would be a great public benefit if, in all towns possessing an art gallery, the municipal authorities devote a portion of it to the formation of an architectural gallery or museum, where means of casts and drawings and reproductions of examples of the various styles of architecture of the history of architecture might be seen from its earliest days. In such a museum there might be a collection of building material where the art student and workman would be able to study the characters and methods of such materials, and more especially specimens of those materials the most suitable for the locality. It should also be preserved means of drawings and models, a record of ancient buildings which in so many towns in the course of events to be cleared a make room for town improvements and improvements.

"There are very few places outside London where the art student has facilities for studying his art from actual examples, and it is few who can spare the time and expect frequent visits to London for this purpose, is only by enlisting the sympathies of the public in matters of art that we can expect to see such a museum successful, and it should be the duties of our society to make the art gallery I feel sure that in making such an attempt should have the sympathy and hearty cooperation of the members of the Committee of the Municipal School of Art. This Committee have taken an excellent step in forming a collection of architectural subjects at the end of Art in Cavendish-street, but to be of use to the public it should be on a large scale and housed in a more central position.

"In Dublin there is an excellent collection in the Art Gallery of examples illustrating only of early Irish architecture, but also of some of the finest buildings in Europe.

"It is to be hoped that when a new gallery is built in Manchester, our Corporation will be able to provide for an architectural gallery and museum. At the right time it will be the duty of our Society to take the matter and to persuade the authorities of the necessity of carrying it out.

"A subject which has again received considerable amount of attention from the profession during the last twelve months on which I spoke pretty fully in my address last year. I refer to the question of registration of architects, or, I would call it, the compulsory qualification of architects.

"The question of the meaning of the term 'qualified architect' was brought up some few months ago. A young architect practising in Manchester, came to tell me he was applying for a public appointment, and that one of the conditions of the appointment was that the applicant should be a 'fully qualified architect,' and he wished to consult me as to what that meant. I told him there was no such legally recognised term. I supposed that he must be a member of the Institute of British Architects; but that certainly not confer upon him any legal qualification as a qualified architect; if it would exclude a very large number of men occupying the highest positions in our profession but who are not members of the Institute.

"I frankly confess that my feeling on this matter is that any man before he is allowed to call himself a qualified architect should have passed compulsory examinations which would show that he is entitled to use the term, and no architect should be eligible for an appointment until he is duly qualified.

"During the past year alterations have been made in our Articles of Association with a view to facilitating the alliance of neighbouring societies of architects to our own society under those new provisions the Blackpool and Fylde Architectural Association have allied to our society. This is a most important event in our history, and it is to be hoped it will lead to further alliances. The architects bind themselves together for

* November 9, 1901.

port and assistance, the stronger they will come as a profession. There must be a large number of architects practising in towns com- posed in our district who would for many reasons find it beneficial to belong to a society such as ours. I feel convinced that before many years are passed Manchester will become a very important centre for the education of architectural students, and that the training which will be given at the Manchester School of Architecture will draw students from all parts of the district. It is most encouraging to learn that a very fair number of students have entered this session for the degree course as well as for the ordinary classes. There is no doubt in my mind that, for a student who can afford it, the best course he can take is to enter the degree course; this will take him three years after he has passed his matriculation. He should be articled from the commencement to the practising architect, and during the time he is studying at the university he should pass his spare time in the office. The first year's time will be taken up very largely with his studies, but during the second and third years he will have some time to spend in the office; if he articled for four years, his last year will be spent entirely in the office. Such a course as will be an excellent training, combining both theoretical and practical teaching. At the end of his four years' course, he will be able to take his B.A. degree, and will be exempt from passing the Intermediate examinations of the R.I.B.A. The range of studies through which he will have passed will help him very considerably in preparing for the final examination of the R.I.B.A. When one sees the enormous advantages in the matter of education which are now open to architectural students, one cannot help feel a strong feeling and a strong feeling of regret that such advantages were not to be obtained by one's younger days. It is a perfect treat to go through the curricula of the Architectural Association and to see the variety of subjects which instruction is given—perspective, descriptive and solid geometry, Greek and Roman architecture and classic ornament, principles of building, construction, mediæval and renaissance architecture, elementary physics as applicable to building, drawing and design, and application of materials, construction, hygiene, ventilation and heating, professional practice, land surveying, quantity surveying, modelling, water colours, sketching and painting, etc., etc. This long list shows that an enormous variety of subjects are taught and it is expected to have some knowledge of all makes one think that this life is almost short to acquire all the knowledge requisite to make a successful career in our profession.

An excellent line of the Association is that its members may send in designs to classes of design by post, and the visitors to their criticisms upon the drawings. This, I think, would be a useful line for our Education Committee to take up in respect of our country schools.

The Council of the R.I.B.A. have had under consideration for some time a scheme for extended architectural education, and a very interesting committee has been engaged formulating a scheme; no doubt, before very long we shall have an official intimation of this.

A very important resolution, and one that should be generally known by architects, was passed this year by the general body of the R.I.B.A., that after December 31, 1906, entrance to the Fellowship of the Institute should, except under special circumstances, be confined to Associates or those who have passed an examination qualifying for Associateship.

No doubt, this decision will materially help to increase the numbers of the Fellows, for there must be many practising architects who are put off joining the R.I.B.A. till a more convenient or less busy season, knowing that the probability they would be accepted on probation. It will, however, be a very serious matter if a man is obliged to pass an examination before being admitted. How many of us who are busily employed in our office could find time or be disposed to prepare and pass an examination?

During the last year many important architectural schemes have been decided upon throughout the country; the commencement of the building of the cathedral at Liverpool has been made, and during the next few years we shall be able to watch the growth of a great church under the hand of one of the greatest of our church architects, in conjunction with a

young architect who bears the honoured name of his grandfather, Sir George Gilbert Scott. The appointment of an architect to carry out important extensions to the national building, the British Museum, has been decided, and, in connexion with this appointment, it is interesting to remember that the assistance of the Royal Institute was asked by the Government.

“But more closely concerning ourselves, the long-discussed question of a new infirmary for Manchester has been decided upon. We congratulate our colleague, Mr. Brooke, on his success in the competition which took place.

“Many of us, no doubt, will see with regret the removal of the old infirmary from the central position in our city which it has for so many years occupied. Its black and grimy walls have been known to most of us all our lives, and we shall miss them when they have gone. Despite its blackness, there is a dignity in its design which, favoured by a splendid situation, has endeared it to all of us, but, independently of the question of convenience or inconvenience of working, we shall all, I think, agree that it is better to have the infirmary built in the comparatively healthy air of Oxford-road.

“An important question which will before long have to be decided is what is to be done with the site when the old buildings are removed. My own feeling is that it should be left as an open space entirely unbuilt upon, possibly laid down partly with grass and planted with trees which, if the air of Piccadilly is so good as some of the doctors have told us it is, should thrive well there. On this space I would reserve positions for statues of those of our townsmen who are considered worthy of this honour and of other public men. If this large space were left open, and much of the surrounding properties rebuilt, Manchester would possess one of the finest squares in the world.

“Our old city certainly wants some brightening up; it has in many parts of it only a second-rate appearance, its streets are mostly too narrow, and although during the last few years a large part of it has been rebuilt, yet for the most part, especially in our principal street, with a few exceptions the buildings are old and dirty. It is a very serious question what materials should be used for new buildings in such an atmosphere as we have in Manchester, although this atmosphere has doubtless improved immensely since the use of hydraulic and electric power took the place of steam power, which required boilers and large chimneys belching out their black smoke continuously. All materials get dirty, and I cannot help thinking that in streets such as Market-street the best materials to use for facing the buildings is cement, on condition that the Corporation have authority to compel owners to paint them every two years. It would, no doubt, be objected that this would be very expensive to owners, but I do not think so; the interest on the difference in the initial cost between a stone front or a brick and terra-cotta front and a cement front would go a long way towards paying for the painting. I am afraid I shall be considered rather a heathen for suggesting this, but I believe if it were carried out our streets would be lighter and brighter and cleaner and healthier than they are at present. Cement, if properly used, is a perfectly legitimate material, though generally not a very desirable material for building purposes. It should be treated as a plastic substance and not used as a mere imitation of stone. Mouldings should be small and refined, and ornamental panels and decoration can be freely used if not made to look constructional; a great drawback to the use of it is that by continual coats of paint the mouldings get distorted and destroyed.

“The narrowness of our streets is becoming a very serious matter now that they are so much used by electric trams. It often strikes me, when standing at some of the busy crossings—as, for instance, where Corporation-street and Cross-street meet Market-street—whether light bridges for foot passengers could not be erected, which, if well designed, might be picturesque objects in our streets.

“A deplorable cause of ugliness in some of our streets is the necessity for many of the buildings having to be kept low or mutilated on account of owners on the opposite side of the street being possessors of certain rights of light. The difficulties in connexion with this matter have been very great in the past, but, since the judgment in the Colle's case, I think the difficulties will be minimised in the future. Probably before long the Bill promoted by the

Surveyors' Institute and the R.I.B.A. may become law, and we shall then have some definite points to work to.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

THE following is the greater portion of the opening address delivered last week by Mr. Thomas Winder, the President of the Sheffield Society of Architects and Surveyors:—

“There are at present no burning questions affecting us professionally; registration, having been taken up by the Royal Institute of British Architects, should, I think, be treated by us as *sub judice*, especially as most of the allied societies have expressed their opinions upon it, and have nominated representatives upon the Committee which the Institute has formed to consider it.

“I would take this opportunity of impressing upon our members the importance of loyalty to the principal representative bodies of our profession. I believe, however, such loyalty would be better assured were we properly represented on the councils of these institutions. For some years past our Society has not been represented on the Council of the Royal Institute of British Architects—a state of things which, we feel, should not continue.”

“The Institute is capable of even greater usefulness than at present. I cannot understand why it leaves the Competitions Reform Association to do work which I think should be done by the Institution. It is now many years since our then president, Mr. Reginald Fowler, expressed the hope that we might soon be allied to the Surveyors' Institution, but this desirable alliance is still unaccomplished. We could be of mutual assistance to each other, and at this time we need to stand shoulder to shoulder to resist encroachments which are being daily made upon our duties by members of other professions—witness the fearful and wonderful plans recently drawn and deposited by a judge, whose own profession is protected by law against amateur encroachments.

“Last year I expressed my views upon the administration of by-laws by local authorities, and the experience of the past year has in no way modified such views. A suggestion was recently made that the Corporation should nominate a Court of Appeal, to which aggrieved property owners could have easy access. If such Court were properly constituted it might do valuable work. It should, however, consist of sensible men who would not take the usual official and erroneous view that property owners, builders, and even architects and surveyors, are continually attempting to evade the law and to scamp their work. What we ask is that councillors should make themselves acquainted with the true facts of the case, and that common sense and uniformity should be exercised in the administration of the by-laws.

“We have heard nothing more of the proposed new by-laws, but we have the assurance of the Town Clerk that we shall be consulted before these are finally put forward.

“Has not the time fully arrived for the consolidation of by-laws and of local and other Acts of Parliament relating to new streets and buildings? At the present time one's knowledge needs to be as extensive as that of the daring property owner who attempts to take advantage (save the mark) of the London Lands Registration Act of 1899, with its three hundred and odd rules. Why, for example, should Chapel-le-Frith, which embraces an extensive country district, require rooms of greater height than Sheffield, with its slums and smoke? It is with grim satisfaction that I have read the remarks of urban and city officials upon the administration of the Model By-laws by the Local Government Board; an application which we are told renders it impossible for urban authorities and corporations to compete with builders and private enterprise in the erection of artisan dwellings; a result which, I am sure, none of us regret, professionally or as ratepayers. It is to be regretted that a section of the Sheffield Corporation still adheres to the policy of providing artisan's dwellings, but I am thankful to see that this question has

* Presidents of allied societies are, *ex officio*, eligible as members of the R.I.B.A. Council if they are Fellows of the Institute, but the number of seats available (by the constitution of the council) is not equal to the number of the allied societies, consequently it is to some extent a matter of majority votes. This, we think, might and should be altered. But if a society elects a President who is not a Fellow of the Institute, it debars itself from representation by its own act.—Ed.

been taken out of the arena of party politics, and that those men of each party whose opinions we value most highly are giving the subject careful and fair consideration, apart from party interests. The provision of dwellings for artisans by corporations, as at present carried out, is totally unnecessary and extravagant. The private capitalist does, and will, if given fair play, provide more than enough of such dwellings at a reasonable cost, as witness the ridiculous *fiasco* at a Local Government inquiry held in a neighbouring town. After the inspector had been assured of the great need for corporation-provided artisans' dwellings, evidence was given that something like four hundred of the cottages in that town were unoccupied.

"The provision of cottages for the extreme poor is quite another matter, and none of us will grudge those even if provided at an apparent loss. Ordinary cottages are completely worn out in less than one hundred years. This is fortunate, as long before that time has elapsed most of them are out of date, sanitarily and otherwise, and very many of them are then in the wrong part of the city. This will be even more so in the future, as the extension of rapid transit in, around, and (I hope before long) far outside of our towns and cities will solve the artisans' dwellings question. I would suggest that the extreme poor should be catered for by the erection of one-story wood and galvanised iron huts upon land to be purchased by corporations. These have a life of twenty to twenty-five years, and I am assured by those who have lived in them that they are very comfortable. If properly-protected wood is used, the fear of fire should be almost nil, and, if fire did occur, there would be little danger with single-story buildings. At the expiration of twenty to twenty-five years these huts might be destroyed and new ones erected in more convenient positions. The increased value of the sites would often show a good profit on the transaction.

"Last year I drew attention to the danger of the heavy trades being driven from Sheffield through the administration of the by-laws, but a far more probable cause of this is the awful increase in our rates; an increase largely consequent upon the reckless manner in which Sheffield is keeping ahead of most other towns and cities in the amount to which its rates are mortgaged. A further loan of 270,000*l.* is to be asked for in addition to the five and three-quarter million pounds we already owe. The President of the Auctioneers' Institution in his very able address informed his hearers that Sheffield is indebted to about 10*l.* per head of population, but it perhaps puts it more graphically to say that it is indebted to the extent of probably 50*l.* per ratepayer, and the Corporation is asking for power to increase that indebtedness by another 6*l.* or 8*l.* per ratepayer. The payment of interest and sinking fund upon these loans constitutes a very serious burden upon property, and although we are constantly told that part of this debt has been incurred for profit-earning concerns (profits, by the way, to be earned from the unfortunate debtors, the ratepayers), we know that other parts are for work which has since become more or less obsolete, and some of which has actually been replaced by work paid for out of later loans. Those of us who are daily dealing with values of property are only too well aware of the seriousness of the position which is being created throughout England and Wales by this second national debt, a debt which now amounts to almost three hundred and forty-three millions. It is satisfactory to see that the Public Loan Commissioners are making a decided stand against further increases. I believe the present 'slump' is largely due to the fact that for some years past we have, in addition to our incomes, been spending vast sums of borrowed money, thus creating an artificial prosperity; and whilst perhaps delaying the periodical visit of bad trade, leading to a far greater depression in the end. In proof of this the demand for building land is less at the present time than I have known it during an experience of a third of a century.

"Last year I suggested the desirability of the Sheffield Society of Architects and Surveyors undertaking the chronicling of the names of architects of old and new buildings in Sheffield. I am the more convinced of the desirability of this being done from noting how seldom the architect's name appears in notices of new buildings in the daily press, even where such notice is illustrated by the architect's own drawings;

I also mentioned the work which we might do towards the preservation of archaeological facts and drawings, and although our Society has done nothing towards this, I am pleased to see that a local branch of 'The National Trust for Places of Historic Interest or Natural Beauty' has been formed.

"A question which concerns us as surveyors and valuers is that of street dedication charges, and of the costly way in which road-making is done, in cases where it can be imposed upon the owner. During the past year I have come across the two following cases. A person paid 700*l.* for an old property abutting upon two streets—he received an account from the Corporation for 217*l.*, or almost one-third of the price he had paid for the property, this being dedication charges upon one of the streets. Another owner with four cottages showing a gross rental of 70*l.* per annum, was mulcted in about two years' gross rent. Each street was made upwards of twenty-five years ago, at a cost of probably 3*l.* per lineal yard, and has since been maintained by the owner. These are but two out of scores of cases, but they are particularly hard upon the owners from the fact that each property abuts upon two streets. It is patent to every one that cottage properties do not require frontages to two streets, and that the second street in each case must have been provided for the benefit of the public. Unfortunately there is an idea amongst certain of our citizens that the ownership of property is a crime to be punished wherever possible by the infliction of charges in one form or another, but we, as experts in property, should do our best to educate them out of this, remembering that those who are most hardly hit by these grossly extravagant dedication charges are the thrifty lower middle-classes, and the careful working-man, who has often invested the whole of his savings in the purchase of a home, only to find that his thrift has landed him in serious financial difficulties.

"The Bill recently before Parliament for the taxation of ground values deserves careful consideration by us. Its supporters claim that it is needed to counteract the holding over of ground by land-owners price. This is fallacious, as such holding over seldom occurs. The greatest difficulty in the administration of the Bill, should it become law, will be the determination of what is building land. Six years ago a client of mine was compelled to pay Succession Duty (in itself a heavy tax on land) at building land valuation upon ten or twelve acres of land, which my brother and I rightly contended was merely agricultural land; and although I have advertised this land, I have not received half a dozen applications for building plots upon it, and more eligible land abutting and near it has just been sold by public auction at about one-third the value put upon mine by Somerset House. Had this Bill become law six years ago my client would by now have paid six years' rates, at building land value, for land for which there is no demand, and which is let at about twenty-six shillings per acre per annum. Any legislation which tends to reduce the open spaces in and around our centres of population will be as injurious to public health as Pitt's Window Tax, and such must be the result should the Bill become law, as the authorities must in fairness tax all open land which the ingenuity of the rating surveyor can possibly ticket 'Building land,' including commons, parks, recreation grounds, squares, and those valuable adjuncts to our large towns and cities, the old-fashioned gardens of mansions.

"As architects and surveyors we should be interested in the question of the universal adoption of the metric system. This has been largely adopted in other countries, and although strongly recommended by our Chambers of Commerce, we are too conservative or too conceited to follow suit. Our commerce is suffering in consequence, and all who have to make much use of figures lose valuable time by the present system. Our valuations, estimates, and quantities would be more readily calculated in decimals. The Ordnance Surveyors have recognised this, and have adopted decimals in showing the contents upon the new ordnance maps. I think we should support the Bill which is being promoted to introduce the system universally.

"Attention should be drawn to the acceptance by Somerset House of valuations for probate made by persons who are totally incompetent to make a fair valuation, but who do this work

at prices which a properly qualified man can possibly afford to do.

"In conclusion, I had intended to say something upon the valuations submitted by valuers in arbitrations, etc., but after a careful comparison of the reports of numerous cases find umpires and juries have discovered the fair value can generally be arrived at by taking the average between the amounts given by valuers on each side; and as the figures in which I have arrived at this conclusion can be such examples as the following, taken all at random—

Valuation on behalf of Vendor.	Purchaser's behalf.	Valuation on behalf of Purchaser.
£20,108	£13,808	
1,801	387	
3,125	900	
12,594	950	
4,392	1,562	
3,008	251	
2,786	1,129	
20,228	13,122	

figures which were supported on each by well-known competent professional men, I have come to the conclusion that the question is far too vast for my comprehension and that whatever one may think, it is perhaps best to say little, beyond asking, is this the reason why Somerset House does accept valuations from men who are not known as competent valuers?"

SEWAGE PURIFICATION WORKS FOR SMALL POPULATIONS.*

It is often assumed that the design of sewage purification works for a private house or small institution is a much simpler matter than where the sewage of a large town has to be dealt with; but the author's experience with a large number of sewages of both classes, some of which, as at Yeovil, Manchester, and Leeds, have been highly charged with manufacturing refuse, points to the conclusion that the sewage from a single house is often more difficult to treat than that of a large town. There are several reasons for this.

In the first place the amount of work to be done in a town can generally be ascertained beforehand with some degree of exactness. The present population and the rate of increase are known, accurate information as to the volume of the water supply is often available, and many cases the sewers are already in existence so that the flow therefrom can readily be gauged.

In a private house, on the contrary, especially if it is a new one, it is often a matter of greatest difficulty to ascertain even approximately how many people are likely to inhabit it, and it is seldom that any reliable information as to the amount of water consumed can be obtained.

Furthermore, the population of a town is generally fairly constant, or, if it varies, as in the case of a watering-place, the limits within which such variation takes place are known and the resident population usually forms a considerable proportion of the whole. Variations in the number of occupants of a country house are often much greater, and do not take place with anything like the regularity.

The designer of a private sewage purification plant must, therefore, run the risk, on the one hand, of making the works too small, or, on the other, of spending money unnecessarily, providing more accommodation than is actually required.

The sewage of a single household, moreover, presents wider differences in composition and strength than that of a larger population, which tends more nearly to an average; in the case of a town a representative sample of the sewage can more often be obtained for analysis than in that of a private house.

From houses of the class for which private sewage disposal works are most often required very large amounts of grease is usually washed down the drains. This occurs also at certain public institutions, more particularly at asylums. At one institution with which the author has dealt the waste of fat was enormous, and great difficulty was experienced in inducing the authorities to take proper measures for its interception.

It is to be feared that cases in which it is present to such an extent as to exert a marked effect on the purification of the sewage are no means uncommon. The difficulty was

* A paper read before the Institute of Sanitary Engineers at a meeting on the 6th inst., by Mr. Arthur Martin, A.M.I.C.E., Mem. San. Inst.

causes is often aggravated by the fact that it reaches the purification works in a liquid state, its sojourn in the drains being too short to allow it to cool and solidify. The consequence is that it forms a coating over their solid matter, thus to a great extent hindering it from effective bacterial action.

It may be noted in passing that grease traps, where they occur, are generally too small, and in too many cases they are not properly looked after. Their action would be greatly assisted by allowing the scullery waste to run for a short distance in an open channel before it enters the trap.

Another substance which is sometimes present in sewage in such quantities as to cause appreciable difficulty in its purification is soap. In the sewage from a private house the amount is rarely so great as to give any trouble; but in institutions which take in washing, or in asylums where a great deal of foul linen has to be washed every day, very large quantities are often used. In one case which came under the author's notice recently the amount of anhydrous soap found in an average sample of tank effluent was no less than 32 parts per 100,000. This is, of course, irrespective of the quantity destroyed by use and in the preliminary treatment, and takes no account of the proportion of moisture which soap always contains. The difficulty caused by soap is due partly to its intractability, and to the large amount of oxygen which it absorbs, and partly to the greasy and offensive slime which it forms on the surfaces of the filtering material.

That fat and soap are by no means the only enemies with which the engineer has to contend in dealing with the sewage of public institutions is shown by the revelations made in connexion with a case which recently came before the magistrates at Epsom. It was stated in the course of the trial that sugar, margarine, and even bacon, were melted and sent down the drains, and that pepper, mustard, and condensed milk were got rid of by the same channels. The effect on the sewage purification works was not stated; but there is little doubt that the manager must occasionally have had a very trying time.

The sewage of private houses and of infectious diseases hospitals often contains large quantities of disinfectants; and while these, if used in season, should not interfere to any serious extent with its purification, certain kinds, such as bichloride of mercury, when present in a too large a proportion, are very inimical to bacterial action.

A further illustration of the difficulties which are met with in dealing with sewage of small communities is afforded by the case of a small installation which was laid down under the author's advice some years ago. As a rule it did its work satisfactorily; but occasionally there was a marked falling off in the results, and the liquefying action of the septic tank seemed to be temporarily suspended. Inquiry disclosed the fact that the drains around the house were subjected to a quarterly cleansing, hydrochloric acid being used for the purpose. Under these circumstances it is hardly surprising that the purification works were subject to recurring and severe attacks of indigestion.

Cases are occasionally met with, more often in connexion with a village than with a mansion or public institution, in which, for want of an adequate water supply, the sewage is excessively strong. It is generally believed that bacterial purification processes are inhibited when the sewage is concentrated beyond a certain point; and evidence was given before the Royal Commission on Sewage Disposal to this effect. While it is probable that the limit in question is seldom reached in practice, and that any sewage can be effectually dealt with in suitably designed works, a real difficulty is presented by the practical certainty that sooner or later a proper water supply will be provided. A purification plant designed to meet the present need will, therefore, in all probability become inadequate in the course of a few years, while works for the ultimate duty are laid down at the outset, they will not only be far too large or the immediate requirement, but will be incapable of effecting the high percentage of purification which the concentrated sewage requires.

Apart from all differences in the original composition or strength of the sewage, there is a further consideration which is too often lost sight of in the application to small installations of the data obtained from works on a larger scale. The sewage of a city or large town is

generally collected at a considerable distance from the outfall. During its passage through the sewers the solid matter is subjected to a process of continuous disintegration, so that it reaches the purification works in a more or less finely divided state. This is particularly noticeable where pumping is resorted to. Over and above this mechanical breaking down of the solid matter, the sewage undergoes in the sewers a preliminary bacterial action, which is of great importance in its subsequent treatment. In particular, the whole of the urea, containing a large proportion of the nitrogen in the sewage, is often decomposed before the latter arrives at the outfall. The purification works of a large town are thus relieved of an important part of the work which would otherwise fall to them, while smaller installations, which, as a rule receive their sewage in a comparatively fresh condition, have this work still to perform. This consideration has often been lost sight of in the design of small septic tanks, the duration of stay provided for in them having been only the same as was found to suffice in larger works, with the result that the tanks have sludged up in a surprisingly short space of time, and large quantities of undigested solid matter have passed on to the filters.

There is another circumstance which leads to the escape of solid particles from a small septic tank, and which often does not receive the attention which it deserves—namely, the disturbance caused by the inflow. In tanks of considerable length there is ample room for the incoming sewage to come to rest, even where the inlets are not arranged to the best advantage. In a small tank, on the other hand, the inlet and outlet are so close together that the disturbance caused by the one is communicated almost immediately to the other, with the result that appreciable quantities of organic matter are washed out of the tank. This tendency is aggravated by the fact that the sewage comes down in flushes, which, where the drains are short, arrive at the works in something like their full force. The emptying of a bath or washtub causes an enormous disturbance in a small tank, to the contents of which the discharge even of a water-closet bears a greater proportion than that of a large flush tank to those of the septic tanks serving a town.

Passing on to considerations of a broader nature, we come first to the question of choice of site. For dealing with the sewage of a town or village a suitable site can generally be found somewhere in the neighbourhood, and the Local Authority can obtain compulsory powers for acquiring it, which are denied to private owners and to the governing bodies of many public institutions. The latter must therefore, as a rule, deal with their sewage on their own land, which generally means that the sewage works have to be in fairly close proximity to the house or other building. In such a case the utmost care must be taken to prevent smell from the works, in addition to which it is sometimes necessary to render the latter invisible.

Where, on the other hand, a site can be obtained at some distance from the house, its utilisation often involves a difficulty of another kind, namely, lack of the fall, which is absolutely necessary for any complete system of purification. Of this, as little as 9 in. or 1 ft. may be made to suffice, while from 4 ft. to 6 ft. is desirable; undue limitation in this respect involving a material increase in the extent and cost of the works.

In dealing with the sewage of a town, where it is possible to use gradients of 1 in 1,000, or even flatter in case of need, a thousand yards of outfall sewer, more or less, do not entail any serious loss of fall; but to convey the sewage of a single house to any such distance, at the flattest gradients which it is considered safe to use in such cases, some 30 ft. or 40 ft. of fall is required. It is often impracticable to obtain anything like such a fall, except by pumping. The construction and operation of a pumping plant involve more expense and trouble than most private owners are willing to face, and are no light matter for an Institution or good-sized village.

The difficulty of lack of fall has been met with in several cases with which the author has recently had to deal. He has overcome it by liquefying the sewage at the head of the outfall drain, whereby he has been enabled to carry the effluent to filters at any desired distance in a sealed main without appreciable fall. Unnecessary difficulty is often caused by postponing the question of dealing with the sewage until after the drains have been laid, and using

up in the latter the whole of the available fall, leaving none for the outfall drains and purification works. Gradients of 1 in 40 and 1 in 60 are very desirable for house drains where the necessary fall can be spared; but where their adoption involves difficulties in the disposal of the sewage, flatter gradients should be used, which, with due care in laying the pipes and proper means of flushing them, may quite safely be done.

The difficulties inherent in the purification of small quantities of sewage are enhanced to no small extent by the limitations under which one has to work in dealing with them. The restrictions imposed by proximity to buildings have already been referred to. Not less important are those due to the scale of the works. In treating sewage in large quantities the engineer may avail himself of every device whereby labour can be saved or the efficiency of the treatment enhanced. In a small installation, on the other hand, such elaboration of the design would be quite out of place, partly on the ground of cost, but chiefly because the refinements which are natural and proper in large works involve undue complexity when reproduced on a small scale.

There is yet one other disadvantage under which the small installation labours as compared with larger works. The latter are almost invariably placed in charge of an attendant, who may or may not devote his whole time to them, but who does, at all events, pay them a visit every two or three days. The small domestic installation also has its nominal caretaker, who is generally a gardener, or other functionary about the place; but his interest in his charge and manner of performing his duties only too often present a marked contrast to those evinced by the trained sewage works manager. The fate of the small installation is well illustrated by a case which came under the author's notice a couple of years ago. The works comprised a septic tank and three filters, two of the latter constituting the working set, and the third being held in reserve. In order to bring the spare filter into use, it had to be connected with the supply and discharge pipes respectively, a very simple operation for which plain printed instructions were provided. After a time complaint was received that the filters were not working properly. It would have been a miracle if they had been, for the author, on proceeding to the spot, found filters Nos. 1 and 2 connected with the supply pipe, and Nos. 2 and 3 with the discharge. The mistake was pointed out and duly rectified, and for a while everything went smoothly. At the end of a few weeks, however, more complaints were received, when it was found that precisely the same mistake had been made as on the former occasion. The caretaker was an intelligent man, whom it would be an insult to describe as incapable of understanding his duties; and the author has little doubt that had there been more for him to do about the installation the work would have engaged his more serious attention. In other cases works have been left absolutely without attention for months at a time. Experiences such as these pointed unmistakably to the necessity for making these small works as far as possible independent of attention, and so laying them out as to leave no loophole whatever for error to creep in. The author has accordingly in his later work kept this consideration steadily in view.

He has set forth the difficulties met with in the design of small installations in considerable detail, not because they are insuperable, but because he believes that they do not, as a rule, receive the attention which they deserve, the rules which apply to larger works being followed without due regard to the differences in the circumstances. In other cases little or no care is taken in the design of the works, the owner merely telling his builder to put in a "tank," and leaving it to his imagination to supply the necessary directions. A "tank" of a kind is accordingly laid down, bearing a more or less distinct resemblance to something which the owner or builder has at some time or other seen or heard of. It may happen by good luck that the "tank" meets the case, no actual nuisance being caused, and the effluent being discharged into a body of water which is not under the charge of a Rivers Board or other vigilant authority. In other cases trouble is experienced, and after a certain amount of fruitless tinkering a professional man is at last called in. By this time so much money has been wasted that the owner is reluctant to spend more, and especially loth to give up the "tank" upon

which so much has already been expended, and with which the engineer has accordingly to do the best he can, when it would be true economy to start *de novo*.

It will now be convenient to sum up the requirements to which a sewage purification plant for a mansion or public institution ought to conform.

It should be unobtrusive, and capable of ready concealment in case of need.

It should give off no perceptible smell.

It should be simple, automatic, and as far as possible foolproof.

For obvious reasons automatic working is particularly desirable in the case of hospitals in which infectious diseases are treated. In this connexion it should be distinctly understood that no amount of skill in the design of an installation will remove the need for reasonable attention to cleanliness in its management. Inattention to this point has been the cause of the greater part of the nuisance which has been experienced from works of the kind.

In view of the fresh condition in which the sewage arrives at the outfall, the necessity for some form of preliminary treatment will be generally conceded. Mere screening will not, as a rule, suffice; and the frequent attention required by screens, and the liability to nuisance therefrom, render it undesirable to use them in such cases as those under consideration.

A defect of screening, as compared with more thorough modes of preliminary treatment, is that it does not effect that blending of the sewage which is desirable, especially in small installations, where its composition varies so greatly at different hours of the day. Some form of tank treatment may, therefore, be regarded as absolutely necessary in such cases. Such treatment may be either chemical or bacterial; but chemical precipitation, while undoubtedly efficient for the removal of suspended solid matter, has certain drawbacks which will prevent its general adoption for small installations. Of these drawbacks the cost of the chemicals must be regarded as the least, the chief being the necessity for frequent attention, the difficulty of disposing of the sludge, and the risk of nuisance from the latter and from the tanks, which must of necessity be open.

It may be added that the chemicals commonly used for precipitation, unless their addition to the sewage is regulated with a precision which it would be hopeless to expect in small works, are found in practice to be inimical to the purification of the liquid. The preliminary treatment will, therefore, as a rule, be bacterial, and will take place either in cultivation tanks or septic tanks. Of these the author personally prefers the latter, largely for the reason that a septic tank, which may be completely hidden, can be used in situations where any open tank would be inadmissible.

In this connexion it may be remarked that a great deal of nonsense has been spoken and written as to the alleged "enormous cost" of arching over septic tanks, and a roof of peat litter has been suggested as being permeable by the tank gases and at the same time deodorising them. Inasmuch, however, as these gases will diffuse freely through concrete, and the overlying soil constitutes an excellent deodorant, a peat roof possesses no advantage over the more substantial covering, which will in most situations be preferable; and everyone who has any practical acquaintance with the subject knows that a concrete arch is in reality a comparatively inexpensive item.

One great practical advantage of covering a tank in this way is that it admits of the latter being placed on any site on which room can be found for it, not only without risk of nuisance, but without giving the slightest indication of its presence on the surface. It will, moreover, in no way interfere with the utilisation of the ground over it.

In view of the variations which take place in the population of a country house, which may at one time be crowded with visitors, and at another be occupied by only a few servants, it has been suggested that the septic tank therefor should be in duplicate, so that the working capacity may be made to conform in some measure to the flow. The same consideration applies to an infectious diseases hospital, which may be empty, except for a small staff, for months together.

Regarding the matter from a purely theoretical point of view, it is possible that for certain sewages an excessive stay in the septic tank may be in some degree disadvantageous. The author's own experience shows that

any difficulty consequent thereon can in most cases be overcome without going to the expense of duplicating the tank. He is also convinced that in small works, at all events, there is nothing to be gained by sub-dividing the filter, and that the smallest flows which are met with during slack seasons will suffice, if properly utilised, to keep a full-sized filter in good condition.

The great practical objection to duplication, apart from its cost, is that it renders the working of an installation dependent on the judgment and vigilance of the attendant. From a long experience of the way in which these small works are looked after, the author has little doubt that one tank or one filter would often be found at work when both are required, and *vice versa*.

Although some septic tanks seem to go on indefinitely without requiring to be cleared, it is not safe to reckon on this; and facilities should always be provided for removing any residuum which may accumulate in them without first drawing off their liquid contents. The reason for this is twofold. In the first place, the emptying of the tank destroys the septic condition therein, which may take some weeks, or even months, to re-establish; and, secondly, the process of emptying, especially in inexperienced hands, is liable to be a very offensive one. The removal of the mineralised residuum, on the other hand, may, if proper means are provided for the purpose, be effected expeditiously and without nuisance.

The final treatment of the sewage may be effected either by irrigation or in bacterial filters; but the treatment of sewage or sewage effluent on land in the neighbourhood of a house or public institution is liable, unless under exceptionally careful management, to give rise to nuisance. Under favourable circumstances the tank effluent may be got rid of by means of a series of open-jointed agricultural pipes laid just under the turf; but scrupulous care must be taken in the execution of the work, or failure is bound to result.

It will generally be found best to complete the purification in a bacterial filter or filters, and this course has the important advantage of placing the whole of the treatment of the sewage under ready control.

A sprinkling feed to the filter is an important aid to purification; but, inasmuch as the showering of tank effluent through the air is liable to give rise to a certain amount of smell, this method should not be used unless the filter is at a safe distance from the house. The exposure of the tank effluent may be avoided by the use of a contact bed, either alone or as a preliminary to a trickling filter. Whatever method of filtration is employed, the tank effluent should not be allowed to run into the filter continuously, but should be ponded until the proper charge has accumulated. By utilising the upper part of the septic tank for this purpose, the expense of a separate ponding chamber will be saved. For the ponding and release of the tank effluent the author uses a very simple automatic gear, consisting merely of a supply valve, a discharge valve, a weighted lever, and a float on each of the valve rods. The working is as follows—As soon as the proper quantity of effluent has accumulated, the float on the supply valve rod rises, opening this valve and closing the discharge valve. The tank effluent is then delivered to the filter, either through a series of perforated distributing pipes, or below the surface of the material, as the circumstances of the case may render advisable. If sprinklers are used, means should be provided for freeing the tank effluent of any suspended matter which it may contain, and which would otherwise choke the perforations. The author prefers fixed sprinklers to moving ones, especially in small installations, where the attention required to keep moving distributors in order would constitute a serious drawback to their use. A perfect distribution of the tank effluent over the surface of the filter is secured without movable distributors by simply varying the head on the orifices.

The weak point of the trickling method—namely, the tendency, which has been pointed out by several experimenters, for the effluent to find short cuts through the filtering material—is overcome by the use of a contact layer in the bottom of the bed, wherein every part of the liquid is held for a short but sufficient period in contact with the filtering material. On the expiration of this period the discharge valve is opened, releasing the filtered effluent.

In dealing with an ordinary sewage, a simple filtration, conducted as above described, with a filter of adequate depth, will, in the majority of cases, effect sufficient purification; but concentrated sewages of, say, two or three gallons per head, a second filtration is sometimes desirable. In such cases the depth of the liquid in the first filter will be the necessary head for the sprinklers.

For filling the filters the author has found it better to beat ordinary furnace clinker broken to a small gauge and freed of dust, in some localities there is a difficulty in obtaining clinker, but in no case within his experience has the difficulty proved insuperable, and is generally worth while to pay the cost of carriage from a distance for the sake of obtaining a material which can be relied on to give satisfactory results.

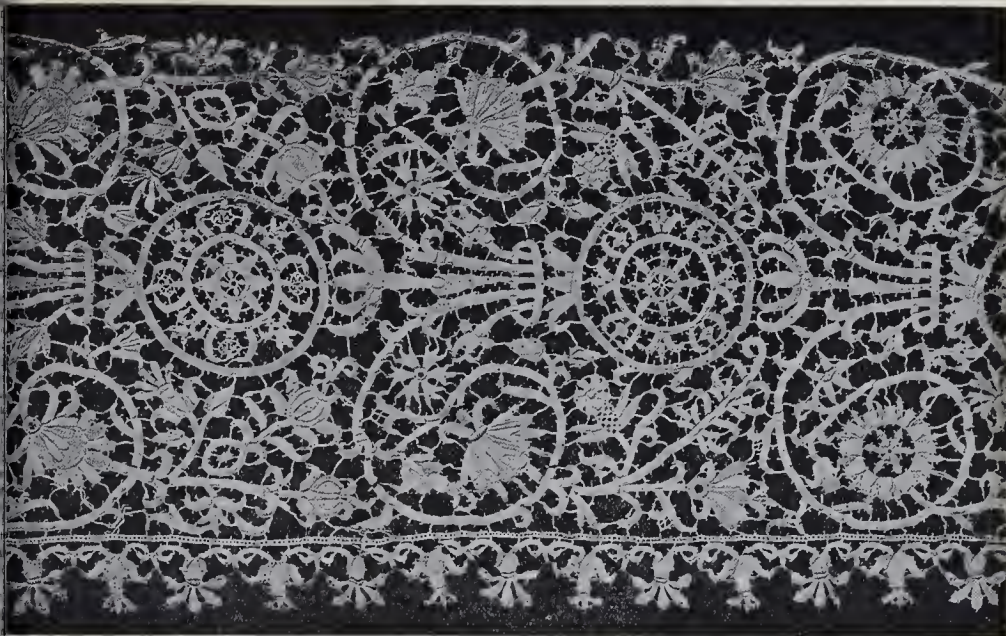
As it is customary for writers who have used the particular process of purifying sewage to claim that their process is the best, if not the only which should be employed, it may not be amiss for the author, while expressing his belief in the method which he has described as simple and effective a solution of the problem under consideration as can well be found, to state that he is fully alive to the possibility that other methods, properly applied, may yield equally satisfactory results. His main object in this paper is not to inculcate any particular mode of purification, but to lay stress on the method whatever method may be adopted, for careful collecting and checking the data required in the design of the works, and especially for the utmost vigilance in watching for any circumstances which may by any possibility interfere with the process employed.

It may not be out of place to utter a word of warning as to the laying down of the works. Where these are small, and at a considerable distance from the office, there is always a temptation to save the owner's pocket by relying upon local supervision of the construction. In nine cases out of ten possibly this is safely done; but in the tenth all concerned may find abundant reason to regret that the designer did not keep the superintendent of his own hands, even at the cost of what he might like a disproportionate expenditure of time and money in travelling to and from the works.

The care of these small installations deserves more attention than it sometimes receives. In particular, written instructions should be provided, clearly and explicitly setting forth what the caretaker has to do, and what is not less important, what he should abstain from doing. In the absence of written instructions, there is always the risk of the caretaker in charge leaving and his place being taken by another who has not the faintest idea of what he is required to do. Many breakdowns and much disappointment would undoubtedly be saved—especially where the owner himself does not take an active interest in the works—if these are periodically inspected by the designer. In saying this, the author wishes to avoid any reflection on the large number of caretakers whose performance of their duties leaves nothing to be desired. There is, unfortunately, a minority who seem to be under the impression that the microbes does everything, leaving nothing to be done by the man with disastrous results to the installation. Caretakers such as this an occasional surprise visit from the designer of the works will be a wholesome stimulus.

In the foregoing remarks the author has endeavoured to show that the efficiency of a sewage purification plant, on the smallest scale as well as the largest scale, is dependent on a number of factors, namely, its design, construction, and management, inattention to any of which will almost certainly result in failure, but that the exercise of reasonable care in each branch of the work success may be assured.

PARISH CHURCH RESTORATION, STENNINGTON, YORKSHIRE.—The ancient parish church of Stennington was reopened recently after restoration, costing about 1,300*l*. In addition to this a stained-glass window has been inserted in the east end, a new oak pulp lamp for the interior of the church, and lectern from the old oak of the church. A Hodgson Fowler, of Durham, was the architect for the work, and Mr. Alfred Barnes, of Malton, the contractor. A new heating apparatus has been inserted by Messrs. Richardson and Co., of Bridlington; the bed has been rebung by Messrs. Malaby and Son, Masham; and the east window is the work of Mr. Knowles, of York.



Venetian Needlepoint Lace. (From an illustration in the "Burlington Magazine.")

VENETIAN NEEDLEPOINT LACE.

As an example of decorative work produced, by permission, from one of the illustrations to an article in the *Burlington Magazine* on the examples of old lace in the collection of Mr. Arthur Blackborne. It is called as "flat Venetian needlepoint," but the name is not given.

As a beautiful example of the application of design to lace work, it cannot fail to be of interest to architects and decorative designers. The size of the original piece is 58 inches by 26 inches. We are indebted to the *Burlington Magazine* for kindly lending us the photograph of which their illustration was produced.

MEETING OF MEDICAL OFFICERS OF HEALTH.

At the annual meeting of the Incorporated Society of Medical Officers of Health was on Friday last week at the Rooms of the Royal Statistical Society, No. 9, Adelphi-ice. Dr. J. F. J. Sykes (Medical Officer of Health for St. Pancras), the President, in the chair, and a vote of thanks was accorded Dr. Groves (Isle of Wight), the retiring president.

Public Health and Architecture.

Dr. Sykes then delivered his presidential address, in the course of which he said that the chief object of the officer of health is constantly called upon to express opinions as to constructive architectural conditions in buildings, old and new.

He should have a knowledge of the construction of dwellings and be familiar with the various methods of construction and arrangement of buildings as affecting health. He should be able to follow an architect in his suggestions for amelioration of unhealthy conditions and to grasp the relative hygienic value of the various alternatives upon which the architect may seek his opinion. His work should be complementary to that of the architect, the two must harmonise for the benefit of the public. In prehistoric dwellings would be the first rudimentary shelters, subject to the grosser unhealthy conditions under which primitive man must have suffered. The types for temporary use were not unknown to us in this country to-day. In nomadic life the picturesque forms of construction were varied, together with the elements of the decorative arts; but, whereas the occupants of the movable dwellings escaped some con-

ditions inimical to life, they incurred other risks. Some types of these dwellings still wander through our land. Early fixed dwellings foreshadowed later types, by illustrating the experiences later gained by man in regard to site, materials, form, and arrangement; experiences that made towards permanency, defence, greater dryness, warmth, cleanliness, and other improvements to better life and health. Dwellings of this rough class, and even rock-dwellings, we also knew in this country at the present time. From these early forms it was not difficult to reconstruct the main outlines in the evolution of the dwelling, generally, and of the English dwelling in particular. Each nation had evolved its own type of building according to time, place, and tradition, and each type showed the attempts to cultivate or avoid conditions favourable or inimical to health according to the exigencies of climate, soil, habit, and other influences. In historic times we found the elements of architectural construction proper commencing in the houses of the Pelasgians. Cottages of similar picturesque, but insanitary type, were still extant, varying only in details. Timber houses were adopted mainly by peoples north of a line drawn across the Eurasian continent through the Aryan centre from south-east to north-west. Abundance of forests facilitated their construction; and they afforded warmth and dryness, and in the east more security during earthquakes. The Mohammedan nations suited their architecture to tropical heat and sandy desert winds by contracting the size of the openings, seeking coolness in darkness, stagnant air, and dirt. The Mediterranean civilisation passed through several stages of architecture, extending over various non-contemporaneous periods—Assyrian, Phœnician, Egyptian, Hebrew, Greek, Etruscan, Roman, Mediæval, and Renaissance. Of the earlier of these we judge the architecture by the remains of palaces, but the common people still dwelt in mud huts, clay-brick cabins, or cobblestone cots. And even down to the spacious days of the Tudors in this country, history tells us of the unhealthy dwellings of the common folk—the flimsy shanties, with clay floors, and hearth in the centre, with smoke-hole above and wind-hole at side. Passing onwards to the present day, the conditions in cities and towns were much ameliorated by Building Acts and By-laws, but a large number of questions are still in a state of flux, and the increasing pressure of buildings one upon the other in

crowded centres was continuously raising fresh questions as to unhealthy influences and physical degeneration. The width and formation of streets, so as not only to subserve traffic requirements, but also to secure circumflation, and the relationship of the height of buildings were in a fair way towards settlement. The adoption of angles of light was simplifying the problem; and attempts to deal with ancient lights by legislation in a more reasonable manner was making slowly towards the solution of the very troublesome question of open space about buildings. But we were still far behind the Continent in neglecting to adopt a system of "zonification" and "stratification" of our buildings in our cities, a system that had become highly developed in German cities and towns, preventing their extension in the haphazard manner permitted in this country, by which endless difficulties as to light, air, and open space were created. The regulation of the construction of courts within buildings was still very unsatisfactory, and the possibilities of creating unhealthy conditions threaten us with disastrous effects in the future. With regard to the movement of air in relation to buildings, we did not sufficiently differentiate between circumflation about a building, perfilation through a building, ventilation within a building, and aerial disconnection from a building. The first had been previously explained. The second was becoming more important now that the vertical perfilation and ventilation of a dwelling-house through the staircase-well is disappearing with the reconstruction of houses in flats, in which only the horizontal movement of air was possible, and emphasised the imperative necessity for preventing the obstruction of perfilation or through-ventilation in these apartments. It was easy to convert flat dwellings into cave dwellings and to create a new generation of troglodytes, if a sufficient proportion in a degenerated condition survive the process without the saving grace of wild or country life. It was too often forgotten that the origin of the word window is wind-hole, and that glass is impervious to air. The ventilation of an under-crowded dwelling-room and of a temporarily excessively over-crowded place of assembly required totally different treatment. The provision of open areas to sunken parts of buildings was much neglected, and they were permitted to disappear in a manner little conducive to produce healthful results. The exclusion of wetness and dampness from

buildings had in recent years received beneficial attention; but some of the regulations for excluding effluvia were very trying to the architect, and equally good results might be obtained by less onerous conditions, especially with regard to the excessive requirements for sanitary conveniences external to buildings, as compared with the less sufficient for those inside. The dwelling requires to be made the principal sanitary unit in legislation and administration on the lines of the precedent set for the regulation of underground dwellings. There should be a limit to the extent to which domestic and sanitary conveniences may be combined, together with regard to health and architectural possibilities. Different classes of dwellings require different regulation, but those of the working classes require most consideration. "There is more hope for the country from the improvement of our homes than from any other source," said the Bishop of Manchester recently. In the centres of our large cities flats for all classes appear to be a modern necessity, and they are increasing in numbers. There was no reason why none but perfectly healthy flats should be constructed, but we had not reached that stage yet. The details and possible hygienic errors of arrangement and construction were numerous, and require fuller consideration than had hitherto been paid to them; and this applied not only to those intended for the working classes, but also to those for the well-to-do. The duties of the medical officer of health in certifying certain of these composite buildings were very important, and would influence the future health conditions of English homes for better or for worse, according to the seriousness with which they were regarded, and the thoroughness with which they were performed. The sub-let tenement house, in its unadapted original architectural arrangement, was also their serious concern. The present legal provisions and by-laws as to this class of house did not sufficiently differentiate between constructive arrangement, fitting, and usage; and the first two of these were lamentably uncontrolled. The provisions for underground dwellings had much improved since 1891, but it was easy to evade them, and there were no provisions for regulating certain unhealthy conditions in dwellings partly underground, but not technically within the legal definition. The improvement of underground hakehouses must have brought home vividly to many medical officers of health the importance of studying structural conditions and architectural alternatives for reducing the unhealthiness of such places; and the feeling that underground restaurant kitchens require similar treatment was testimony to the increasing attention paid by medical officers to the architectural side of their work. The same applied to other premises where food was prepared, and also to other work-places. With the improvement of transit, the erection of suburban dwellings was engaging more attention, but the possibilities in suburbs and more open country were much greater and much simpler towards healthful arrangements, although two-flat cottages and similar erections were becoming numerous. Building regulations in rural districts were engaging particular attention at the present moment, with a view to simplifying them in some directions and strengthening them in others; and it was a hopeful sign that medical officers of health advising rural district councils were taking such deep interest in the framing and modification of such regulations. Perhaps too many details had been entered into, but many more remained to be considered, and the accumulation of these details showed how wide and complicated was the architectural side of the duties of a medical officer of health. One of the fundamental errors of administration at present was that the medical officer was called upon to certify after construction, and had no opportunity of advising before, and of suggesting improvement and simplification, often with the saving of considerable expense. As curative medicine was followed by preventive medicine, so curative sanitation was impatient to be followed by a new era of preventive sanitation.

In the evening the members dined together at the Trocadero Restaurant, Piccadilly-circus, the President occupying the chair. Among those present were:—Mr. Alderman Idris (Mayor of St. Pancras), Dr. Whitelegge, Dr. Pye-Smith (Vice-Chancellor of London University), Dr.

W. A. Bond, Sir T. Stephenson, Dr. G. Millson, Mr. Courthope Munro, Dr. Brown, Mr. T. W. Cutler, F.R.I.B.A., Dr. Shirley Murphy, Dr. Groves, Dr. Newsholme, Mr. Andrew Clark, Dr. Priestley, Mr. I. Young, and Mr. W. A. Lawton (Secretary).

The loyal toasts having been honoured, Dr. Whitelegge proposed "The Municipal Authorities," remarking that the Municipal authorities of this country had a great and increasing burden cast upon them, because the tendency to decentralisation increased as time went on. One thing no public authority could hope to escape, and that was occasional Acts which were mistakes, or which looked like mistakes. One of the mistakes a Municipal authority could least afford to commit was a mistake in the selection of a medical officer of health.

The Mayor of St. Pancras, in responding, said it was difficult to realise the importance of the position of the medical officers of health. Their duty was not only to prevent disease among those who had every possible opportunity of repelling diseases, but their mission was the still higher one to give equality of opportunity to the poor and rich alike of our great city.

In proposing "The Incorporated Society of Medical Officers of Health," Dr. Pye-Smith said it was due to their untiring efforts, prolonged for several generations now, that this country had taken the lead in all the great improvements and reformations which had turned a fever-stricken, foul, and unhealthy country into one of the most wholesome in the world.

The President, in replying to the toast, said the Society had progressed considerably. From eighty all told in the year 1870 their numbers had risen to 937, and he hoped that before his year of office was concluded they would number 1,000. A society which numbered 1,000 members was a society of some weight, especially when they remembered that the majority of those members were Fellows and acting medical officers of health. He held it to be essential that in the course of their duties they should make themselves acquainted with those branches of architectural construction which were so important at the present time, for in these days the tendency was to pack the populations of towns in a manner that was injurious to public health and led to that physical deterioration of which so much was heard. In all classes of society there was this tendency to overcrowd, and the medical profession should join hands with architects and agree among themselves as to the limits of aggregation of population. There was a limit beyond which we could not go without danger to the health of the whole community. We do not want to be decimated by disease; that sort of thing happened in days long past, and it would be a general discredit if it were to happen again.

Dr. W. H. Roberts, President of the Metropolitan branch, and Dr. E. Davis, President of the Western branch, also responded.

Dr. Grove, J.P., then proposed the toast of "Other Kindred Societies," and in response Mr. Andrew Clark said the British Medical Association were endeavouring to forward a Bill in Parliament to get rid of the insecurity of tenure of office of which medical officers complained, and he hoped that during the coming session that Bill would become law, and medical officers would no longer be under liability to removal from office in consequence of doing what they considered to be their public duty. The matter not only concerned medical officers of health; it seriously affected sanitary inspectors.

Other toasts were "Our Guests," proposed by the Chairman and acknowledged by Mr. Cutler and Dr. Beaton, and "The Officers," proposed by Dr. Newsholme, F.R.C.P.

LECTURE HALL, SOLDIERS' HOME, SPITAL TONGUES, NEAR NEWCASTLE-ON-TYNE.—A new lecture hall has been provided at this building, to seat 300 people. In the side overlooking the grounds in Hunter's-road, two stained-glass windows have been provided by Sir Henry H. Scott, illustrating Tennyson's "Idylls of the King and the Holy Grail." The wall behind the platform is prepared as a lantern screen. The old lecture hall has been divided by a passage-way leading to the new hall; and two rooms have been made in the area, one for billiards and the other for devotional meetings. The building was designed by Mr. J. W. Taylor, and has been erected by Mr. Craven, of Newcastle. The exterior is of red brick, with a square tower.

Illustrations.

TOWER, ST. JOHN'S, COWLEY.

THE Church of St. John at Cowley, Oxford, has recently been completed, as regards the interior by the erection of a tower at the west end, shown by the illustration.

The tower is large, being the full width of the nave. It is of low, massive proportions. Like the rest of the church it is simple and indeed, severe in character, as was especially desired by the Cowley Fathers, for which the church was built.

It is entirely of Bath stone ashlar except internally the wide space of this tower, considerably to the effect of the building, and tower are the design of Mr. F. L. Bodley, R.A.

REREDOS, ALL SAINTS, MAIDSTONE.

The scheme of the reredos is suggested by the "Te Deum." It is divided into main compartments, the centre of which contains a panel representing Our Lord in glory surrounded by adoring angels. The side compartments contain each two figures, those on one side representing Apostles and martyrs, and on the other prophets of the Holy Church. The main compartments are divided and flanked by clustered pinnacles, niches containing figures representative of the English Church. The whole is surmounted by a group of angels.

The work has been carried out by Mr. Hitch in Chilmark street, under the direction of Mr. F. L. Pearson.

ENGLISH CHURCH, ENTebbe, UGANDA.

This church was designed for the purpose of the English officials and commandants, Entebbe, the seat of the British Government in Uganda.

The only materials available are sun-dried local bricks, with a small quantity of kiln-burnt bricks and tiles which have to be imported. The timber is cut and worked locally.

After the working drawings had been prepared and forwarded the prevalence of "sleeping sickness" caused a postponement of the commencement of operations until the advisability of continuing Entebbe as the seat of the Government had been determined.

The drawings exhibited at the Royal Academy this year, and now published, are working drawings. Professor Beresford is the architect.

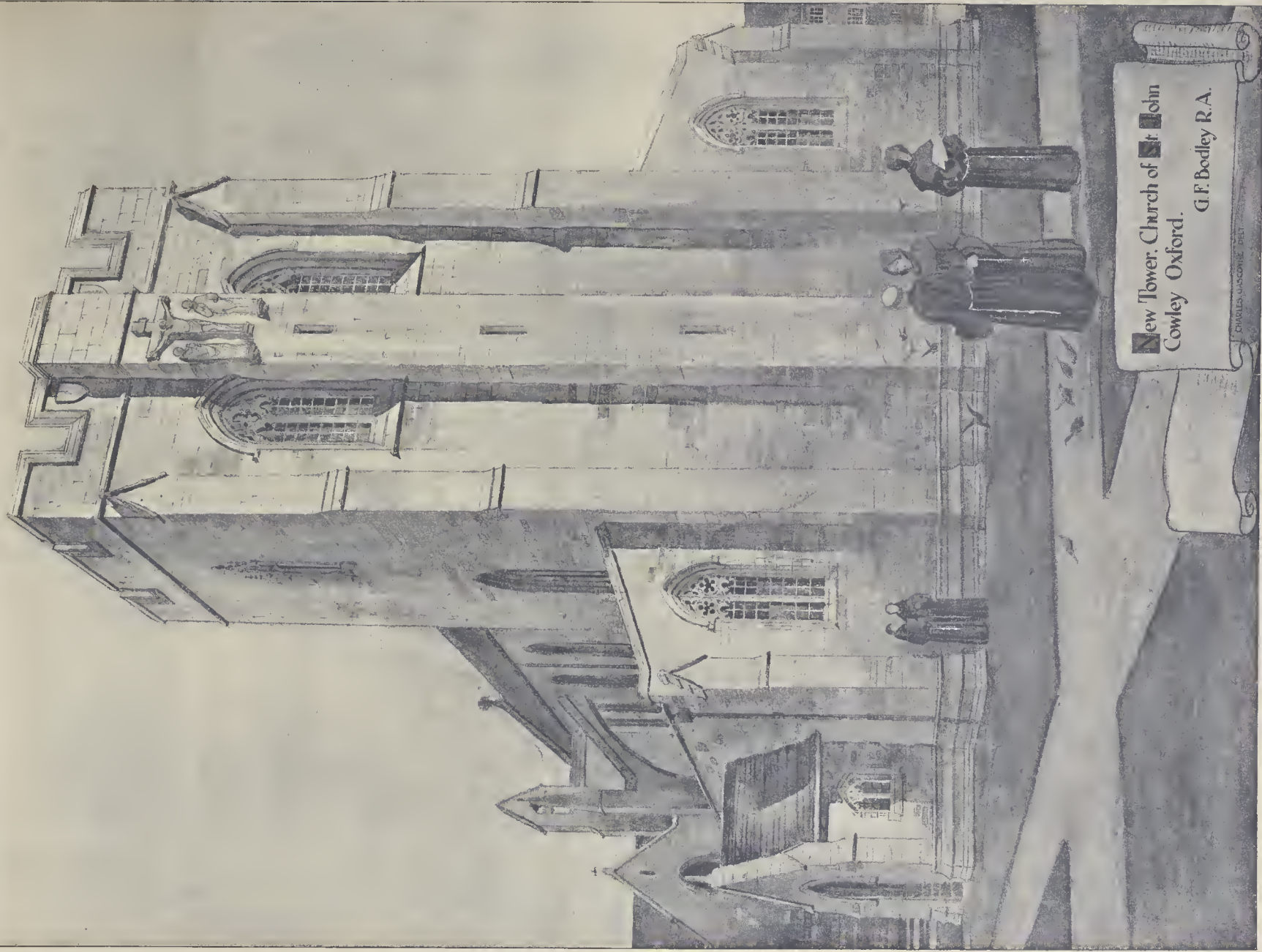
HOUSE, "GWYSANEY"; AND SCOTT'S HOUSE, AT KNOWLE (BRISTOL).

THESE two illustrations are from the designs of two architects no longer living, Mr. J. Baker and Mr. J. D. Sedding. They were awaiting publication at the time of the late decease of their respective authors, but they were put aside at the time; and they have consequently no information about them beyond that conveyed in the drawings, which are them as a memorial of men whose work is much valued.

Judging from the brief inscription on the plan, Mr. Baker's drawing appears to have been a restoration of an old house from sketches of the portions remaining.

NEW CO-OPERATIVE PREMISES, OLDHAM.—The new central premises of the Oldham Co-operative Society at Greenacres Hill, recently opened. The work has been carried out from plans prepared by Mr. T. J. architect.

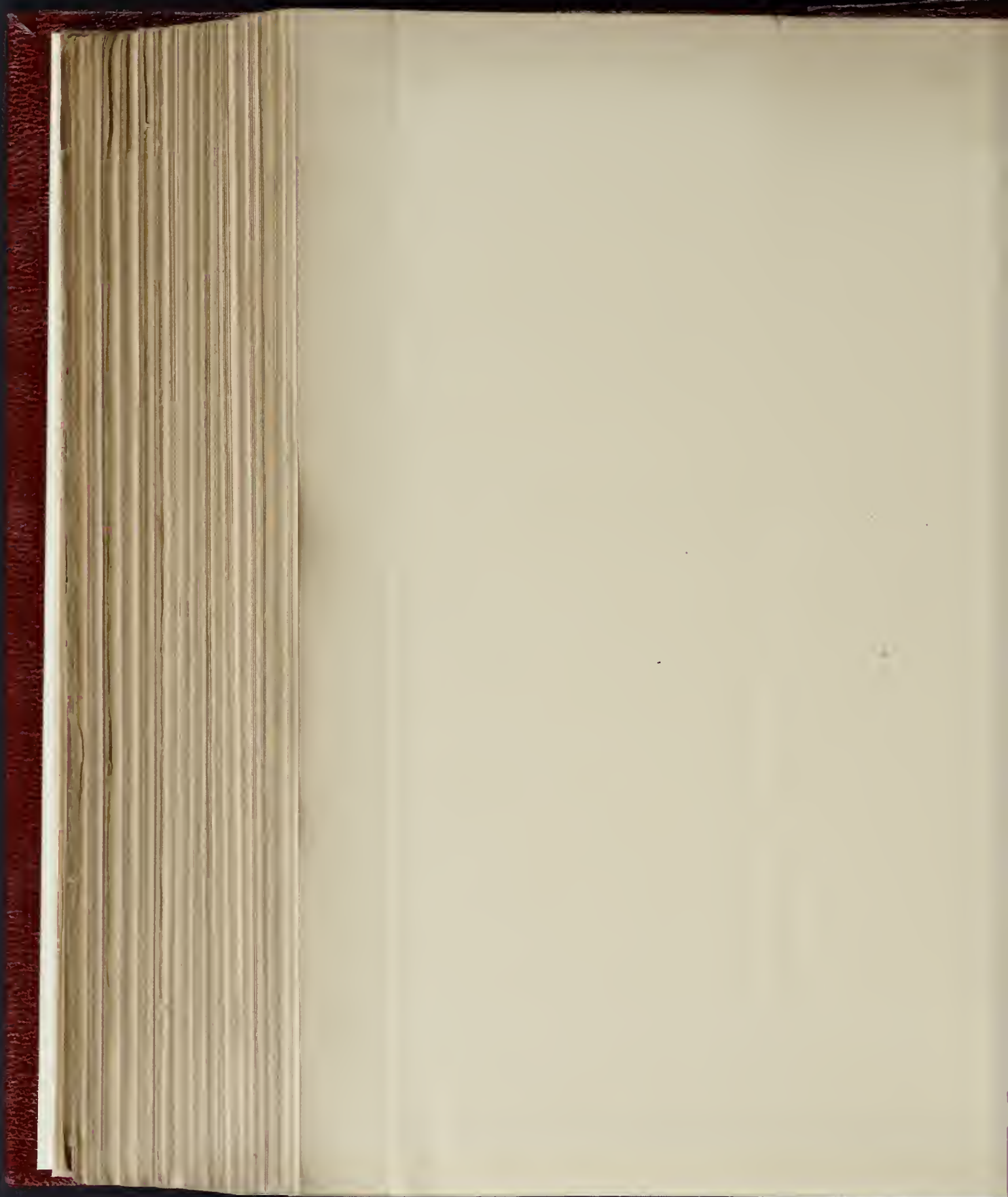
Lor's Eyot, Kew.—We recently came upon the intention of a firm of barge builders and repairers to build a large covered pier for their business, on the island which lies between Kew Gardens and Brentford. The Board of Trade, as custodians of the shore, have refused to sanction the project. The Thames Conservancy to grant them for the construction of the covered dock, it appears that the refusal does not in itself prevent projectors from building upon the Eyot, as their own property, but only prevents them from reclaiming the foreshore in its view. So some danger remains that the beauties of the river at that spot will, in the end, suffer more damage than might be caused if the Conservators' consent had been obtained, for it enforced certain restrictions as to building works which now no longer obtain.

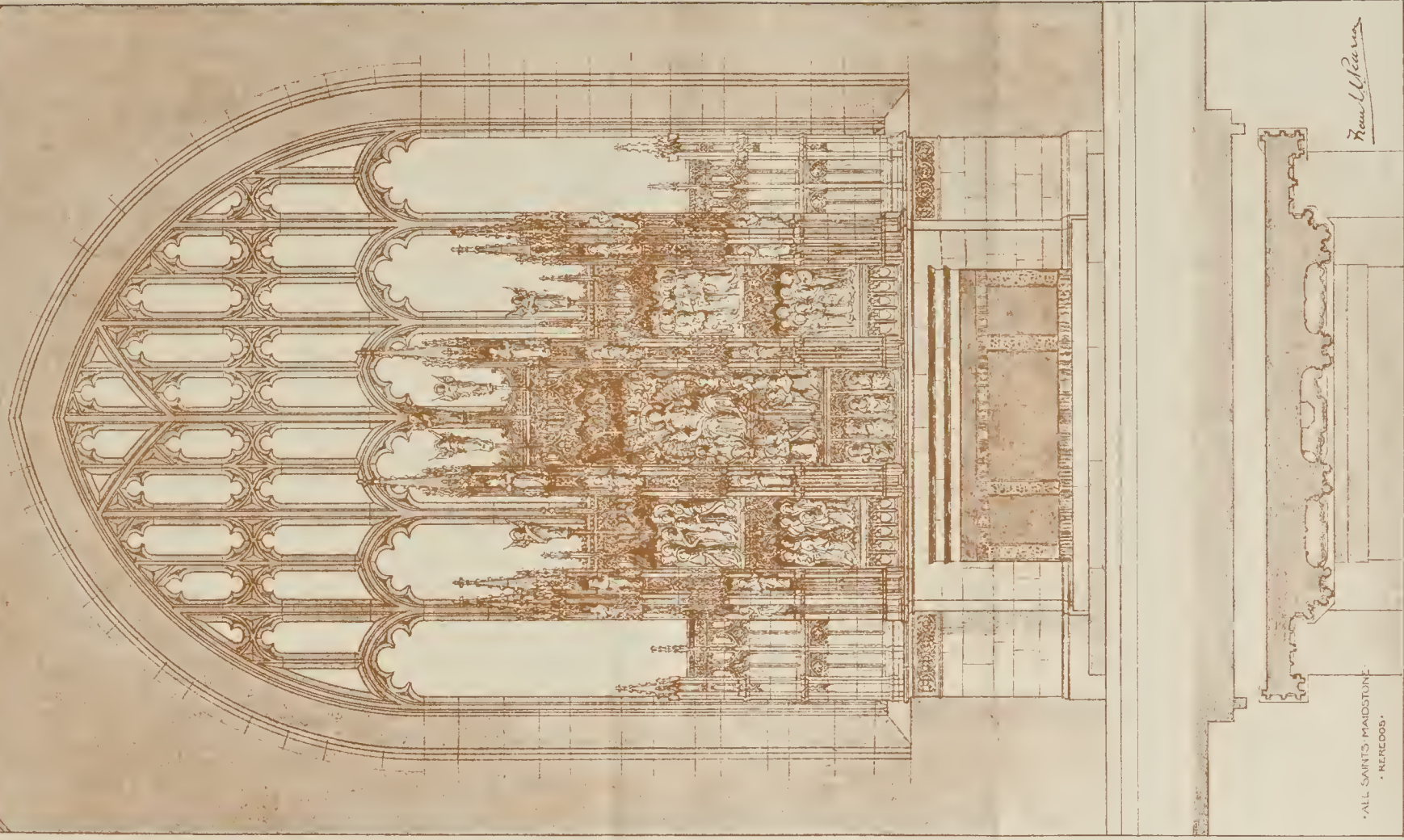


New Tower, Church of St. John
Cowley Oxford.

G.F. Bodley R.A.

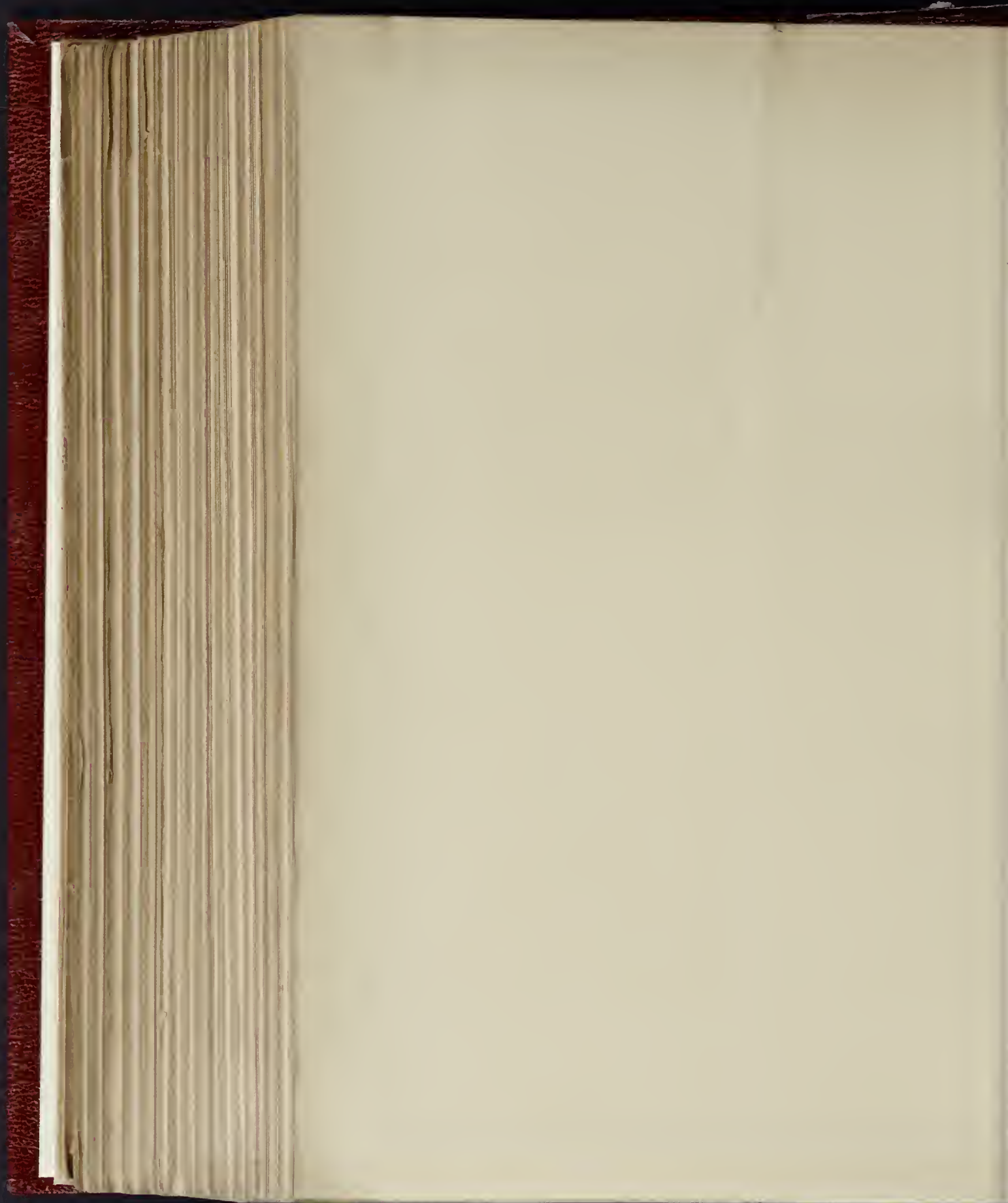
CHARLES JACKSON DEL.

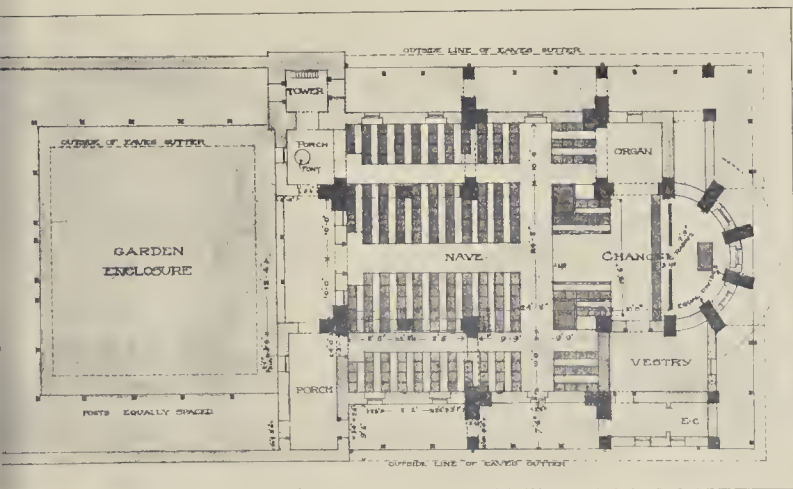


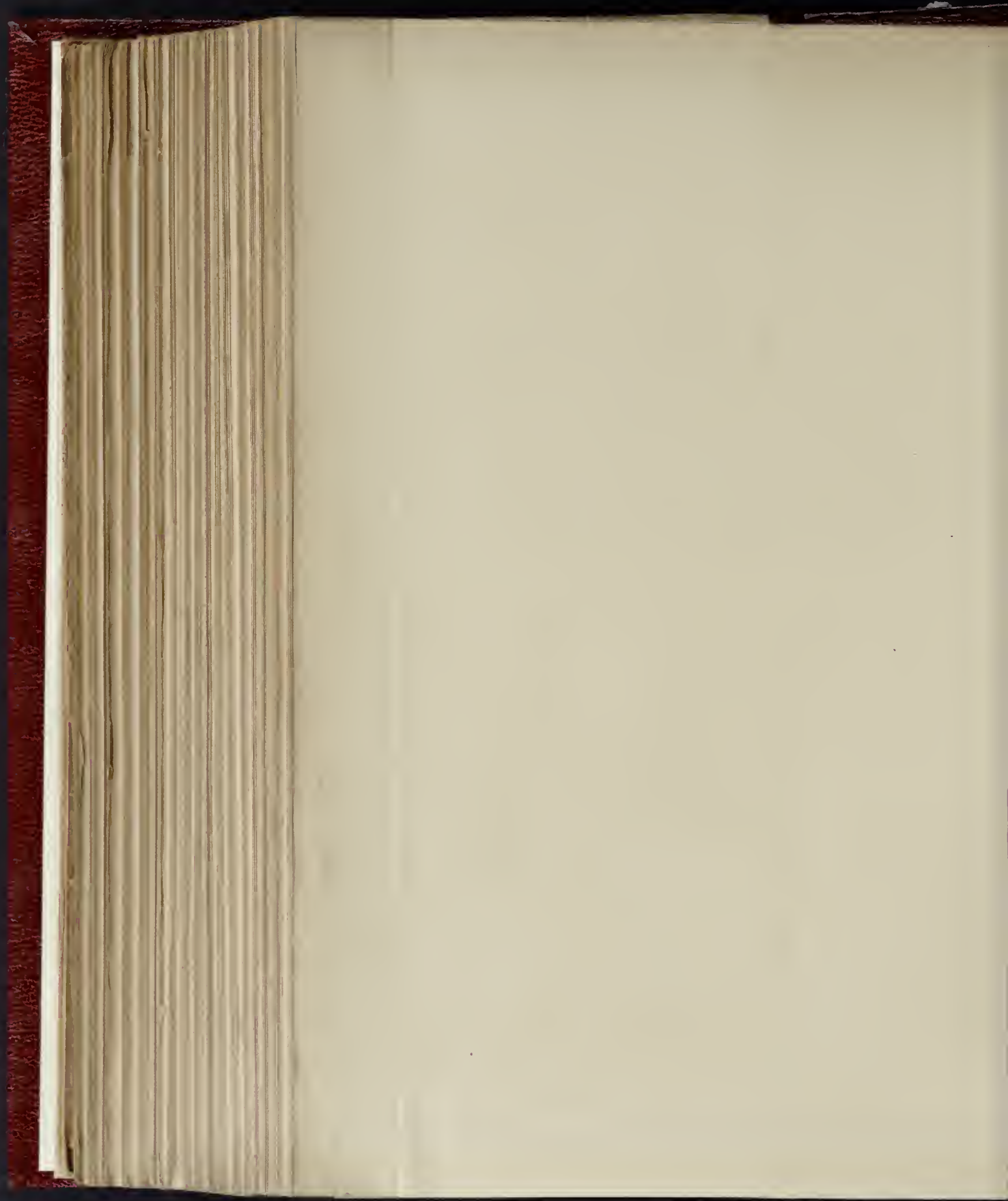


*ALL SAINTS, MAIDSTONE
* REARDOSS *

Rowland Owen







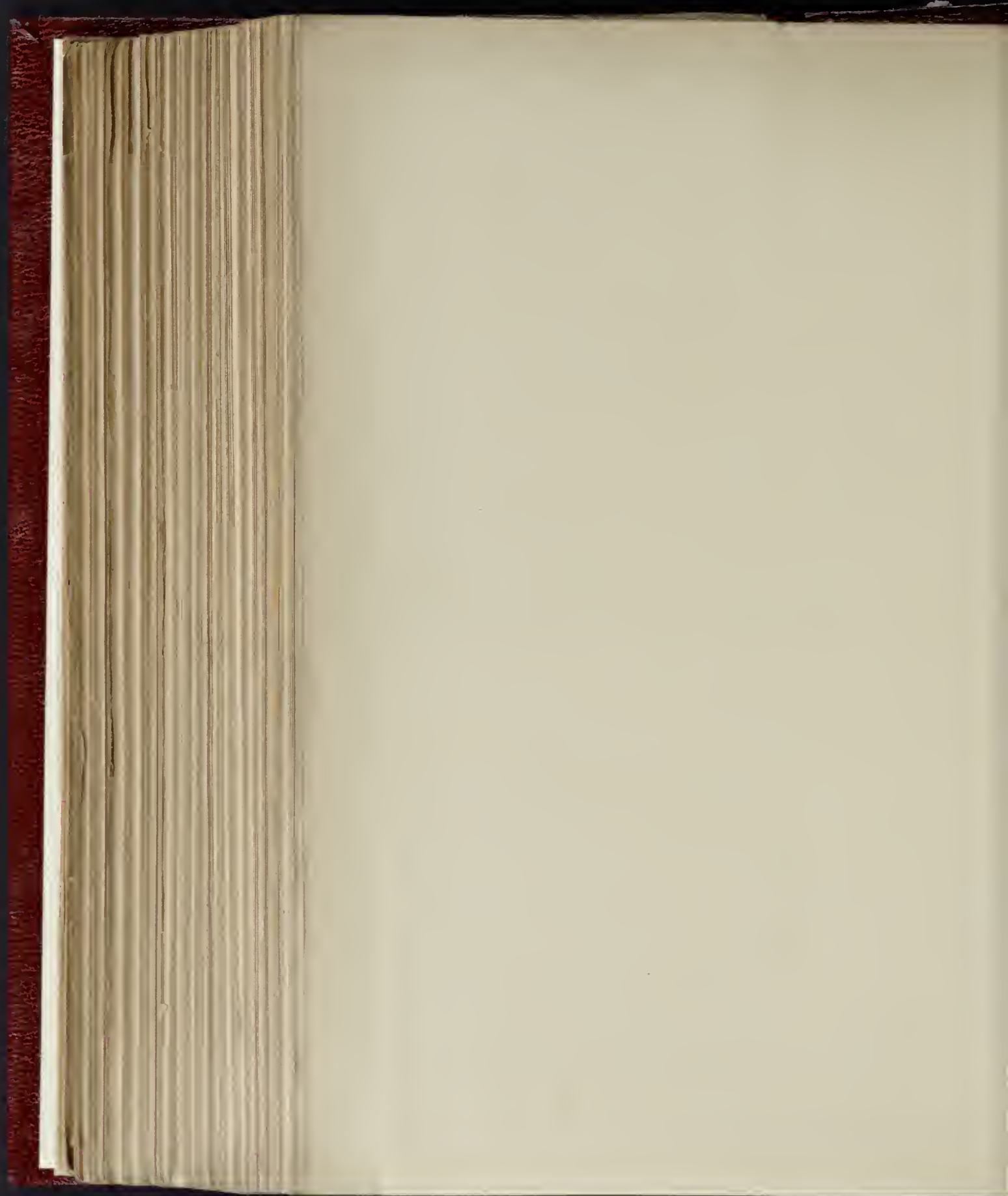


INK PHOTO: SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



INK PHOTO: SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

SCHOOLS AT KNOWLE, BRISTOL: INTERIOR VIEW OF REFECTORY.—THE LATE JOHN D. SEDDING, ARCHITECT



**THE INSTITUTE OF BUILDERS:
ANNUAL DINNER.**

The annual dinner of the Institute of Builders was held on Wednesday in the Whitehall Rooms, Hôtel Métropole, W.C., Mr. C. H. Mansley, President, presiding. There were present Mr. John Belcher, A.R.A., President of the Royal Institute of British Architects; Mr. H. T. Steward, President of the Surveyors' Institution; Mr. E. Guy Dawber, President of the Architectural Association; J. Carmichael, President of the London Master Builders' Association; Mr. F. A. Crisp, Master of the Carpenters' Company; Mr. G. J. Swson, Master of the Tylers' and Bricklayers' Company; Colonel G. Haward Trollope, V.D., Colonel J. Barnsley, V.D., and Messrs. E. W. Mansley, H. H. Bartlett, J. Bell, J.P., J. Ward Colls, Max Clarke, F. L. Dove, Basil Ellis, A. R. G. Fenning, T. Gregory, Benjamin I. Greenwood, Woodman Hill, F. B. Ellis, W. J. Hardcastle, G. W. Humphreys, H. Holliday, T. Holloway, W. Higgs, A. S. Hassall, A. Harrison, W. E. King, Walter Lawrence, W. J. Locke, F. M. May, G. Minter, R. W. Neill, J.P., W. Nicholson, Wlad Plumbe, H. Carter Pegg, A. E. Parker, Joseph Randall, E. R. Robson, T. F. Rider, W. Sphard, E. Selby, C. J. Smithem, W. W. Mas, E. J. Turnbull, A. W. Turnbull, T. B. Minney, C. Wall, J. Sharman Wood, W. F. Ellis, Morgan H. Young, T. Costigan (secretary), and others.

The loyal and patriotic toasts having been poured (Mr. T. F. Rider proposing, and Colonel G. Haward Trollope responding to, the toast of the "Imperial Forces"). Mr. F. A. Crisp proposed "The Institute of Builders and its President." He referred to intimate association between the Carpenters' Company and the Institute of Builders, and that the objects of the Institute were so numerous and their field was so wide that the Institute could not fail to commend itself to all those who were connected in any way with the building trade.

The President, in reply, said the Institute formed for the benefit not only of the London builders but of all those engaged in the building trades throughout the United Kingdom, he thought that his position that evening would remove any idea that there was anything on the part of his London colleagues for consideration of their exclusive interests. The Institute was the trunk, and it was the wish of the provinces to become important branches. The objects of the promoters of the Institute were, among others: the mutual and general benefit of its members and of all those who were engaged in building in the country; to protect the highest interests and welfare of a great and ancient industry, and further to exercise surveillance over matters which from any source might be detrimental to the welfare of the building trade. The existence of the Institute had been justified many ways, and it was never needed more at the present time, when there exists such a desire by public bodies to municipalise the work of the country. Such a desire he regarded as an evil, and it was very necessary to be thoroughly alert and carefully to guard their interests in the matter. If they did not do so in the initial stages of the movement it would become a much more serious matter in the future. He wondered how this tendency could be justified; if it could be shown that the work was undertaken by municipalities was better or cheaper than by private enterprise there might be some reason for it, but experience showed that work was much more properly when executed by a public body, and he being so he was sure that the Institute would welcome the co-operation of architects, surveyors and of others in checking such matters. The Institute was seeking to use its influence in removing, or in seeking to mitigate, growing and arbitrary restrictions which were contained in the building by-laws of local authorities and district councils. This was a very important matter. These by-laws cause irritation and militated against the interests of all concerned, and were responsible to a large extent for the costly execution of many important contracts. Before concluding his remarks, he would briefly refer to a matter which was exciting a good deal of controversy among regarding the actions and the character of working men. As the builders of this country were by far the largest proportion of working men he thought they were well fitted to express their opinion in the matter, though he did not

desire to add any fuel to the fire. Trades unionism was a necessary thing, and in many ways it could be justified; but when it did not inspire workmen to be anything but slothful in business, or when it in any way justified his limitation of output and energy—in effect, to give as little as he could for his money, and consequently lowered his ideal to the standard of least efficiency, thus crushing out his individuality and the opportunity for the development of everything which was best in man—then it became a curse to the country, and its actions demanded to be made public. We were told that work is only well done when done with a will, and be thought that many would agree that that was where the working men of this country were lacking—they were lacking in will and in interest in their work. It had been well said by Emerson that:—

"He who worketh high and wise,
Nor pauses in his plan,
Will take the sun out of the skies
Ere freedom out of man."

The fault he had been referring to did not, in his opinion, rest with the workmen in general; very many of them were true characters, and to know them was to respect them; the fault was largely the workman in his official capacity, and the great trouble which all of them experienced more or less was with the officials of the unions. Officially, the working men were doing themselves a great deal of harm. All employers desired to work harmoniously with their men, and, generally speaking, and especially lately, they did so; and all they asked was that they got a fair return for the outlay. In conclusion, the President referred to the work of their Secretary, Mr. Costigan, which, he said, the Institute greatly appreciated. They greatly admired their Secretary's unflinching energy in anything he could do to forward their interests.

Mr. W. F. King, past President, then proposed "The Architects and Surveyors." As builders, they desired to congratulate the architects on the honourable position to which the profession had attained within living memory. Remembering the character and attainments of the men who had honoured them on such occasions as the present, it was no wonder that the profession had attained to its present position; it would be a matter for wonder if it had not. As to the surveyors, they knew them as men who did their duty without fear and without favour. With the toast he coupled the name of Mr. John Belcher, A.R.A., President of the Royal Institute of British Architects, and Mr. H. T. Steward, President of the Surveyors' Institution.

Mr. Belcher, in response, said that architects were dependent on builders for the realisation of their dreams. Architects recognised that in the evolution of their calling builders preceded architects, and that their business was to build well, as they generally succeeded in doing; but subsequently there rose up a new race, which they knew as the jerry-builder, and then, it was said, the architect came into existence because of the transgressions of the builder, and he acted as a sort of building inspector and policeman. There was a little experience of his own he might mention. When he was very young he thought he would do everything himself, even to settling the builders' accounts—he left that to the quantity surveyor now—and he called the builders' attention to one item, which was obviously two-thirds more in quantity than it should be, and outrageously high in price. The builder was an old man, and he said:—"It is on account of your youth and inexperience that you have made this great mistake, for you have not taken into consideration the many points which, as a builder, I am bound to take into consideration, and which have caused this to be rather high priced; but it is not possible to reduce it." The matter was argued at length, and suddenly the builder gave in and reduced the item at least two-thirds. Some time afterwards he saw the same builder about another job, which he (the speaker) had been able to obtain for him because of the builder's consideration for him, and he asked the builder to be careful about his account, and remembering the little incident he had referred to, that his prices should be moderate. The builder smiled, and said: "Well, I'll tell you how that happened with you. I knew you were a young man, and that you would be glad to point out to your client how much you had been able to reduce the rascally builder's account. Moreover, I always make a similar account, because I find that the architect is so much engaged with this particular item that he always neglects to look at the others."

That was ancient history, and things were not done like that now, and architects and builders understood one another better, and they regarded one another with proper respect. Architects were grateful to builders for their care and attention in carrying out designs, and they acknowledged that the interests of those engaged in the building trade were considered and advanced by them. He might speak of one of their members—i.e., Mr. Howard Colls, a gentleman of light and leading, to whom they all owed a great debt of gratitude for his pluck in resisting the terrors of light and air claims; who, by his appeal to the House of Lords, had obtained a judgment which had placed the whole matter on a proper footing. He hoped that between architects and builder there would always be mutual consideration, respect, trust, and confidence, so that in carrying out work it might be brought to a successful and perfect finish.

Mr. Steward, in responding for the surveyors, said that the profession of surveyor was a very comprehensive one, but in his own case he had been somewhat intimately connected with the trade of builders and contractors for a period extending over very nearly half a century. In his opinion the builders and architects of the present day were very worthy successors of the eminent men of the past generation. He feared that the building trade was suffering in conjunction with other businesses in the general depression of the trade of the country. From his experience, the building trade was one which was the last to feel, but was the last to recover from, bad times, and though some with whom he had been speaking on the subject lately were disposed to think that the building trade would never be what it had been, he ventured to predict that history would repeat itself, and that when the trade of the country had generally recovered, soon afterwards the building trade would be going again with all its force and power, and that there would be, as there had been after every depression he could think of, new and profitable channels for its enterprise. There was a close connexion between builders and surveyors—not only in that good and bad times affected them alike, but in the friendly intercourse and respect and confidence which must exist between them, and he trusted that as between the Institute of Builders and the Surveyors' Institution that good feeling would be maintained and strengthened in the future.

Mr. Neill then suitably proposed "The Visitors," coupled with the names of Mr. G. J. Newson, Master of the Worshipful Company of Tylers and Bricklayers, and Mr. Thomas.

These gentlemen having replied, the proceedings then terminated.

USE OF ELECTRICITY IN FACTORIES.

THE Home Office is about to issue the following draft Regulations to be observed in the use of electricity in factories and other places under section 79 of the Factory and Workshop Act, 1901:—

"DRAFT REGULATIONS FOR THE USE OF ELECTRICITY IN FACTORIES AND OTHER PLACES UNDER THE FACTORY AND WORKSHOP ACT, 1901.

"Whereas the generation, transformation and use of electricity in electrical stations and in any factory, workshop, dock, wharf, quay, warehouse, or other place to which section 79 of the Factory and Workshop Act, 1901, is applied by that Act has been certified in pursuance of the said section 79 to be dangerous:—

"I hereby in pursuance of the powers conferred upon me by that Act make the following Regulations and direct that they shall apply to all places named above, other than electrical stations, in respect of the distribution and use of electricity where the normal working pressure is greater than 250 volts and less than 650 volts between any two conductors:—

"1. All wires in connexion with the supply shall, where practicable, be completely enclosed in strong metal casing, and where this is not practicable they shall be so arranged that there shall be no danger of any shock or of fire.

"2. All main and branch circuits shall be protected by switches and by fuses or other automatic cut-outs.

"3. The supply to every motor or arc lamp shall be controlled by means of an efficient switch, so placed as to be easily handled by the person in charge of the motor or arc lighting, and connected so that by its means all pressure can be cut off from the motor or arc lamp and from any regulating switch resistance or other device in connexion therewith; provided, however, that where the arc lamps are connected in series across the outer conductors of a three-wire system and the pressure cannot exceed 250 volts from earth, it shall be sufficient if one

such switch be provided for each series of arc lamps.

"4. All switches and cut-outs shall be so enclosed and protected or be in such positions or of such construction that there shall be no danger of any shock being obtained in the ordinary handling thereof, or of any fire being caused by their normal or abnormal action.

"5. All metal holders for incandescent lamps, the frames of all motors, and the metal casings of all wires, switches, fuses and cut-outs, shall be efficiently connected with earth.

"6. Where the electricity is derived from a public supply the following conditions shall be observed:—

"(a) A suitable safety fuse or other automatic cut-out shall be inserted in each service line, as close as possible to the point of entry into the premises, and contained within a suitable locked or sealed receptacle of fire-proof construction, except in cases where the service line is protected by fuses in a street box, but no fuse or cut-out shall be inserted in the intermediate conductor of a three-wire system.

"(b) All service lines and apparatus shall be highly insulated and thoroughly protected against injury to the insulation and against access of moisture, and any metal forming part of the electric circuit shall not, unless efficiently connected with earth, be exposed so that it can be touched. All electric conductors shall be so fixed and protected as to be free from risk of electrical discharge to any adjacent metallic substance.

"Provided that in regard to service lines and apparatus under the sole control of a person other than the occupier of the premises to which the supply is given it shall be a sufficient compliance with Regulation 8 on the part of such occupier if he obtains from such person in the month of January in each year a certificate that the Regulation is fully observed in regard to the said service lines and apparatus. Such certificate shall be produced at any time when required by H.M. Inspectors of Factories.

"These Regulations shall come into force on January 1, 1905.

"Home Office,
"Whitehall, 1904."

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, M.P., presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council, 10,637*l.* for paving works; Islington Guardians, 6,500*l.* for poor law purposes; Kensington Borough Council, 9,525*l.* for paving works; and Stepney Borough Council, 2,150*l.* for street improvements.

The Port of London.—The Rivers Committee recommended that:—"Notice be given by public advertisement of the intention of the Council to consider at its meeting on November 8, 1904, a proposal that it shall take the necessary measures for promoting in the next session of Parliament a Bill for and relative to the transfer to a public authority to be constituted by the Bill of the undertakings of the London and India Docks Company, the Surrey Commercial Dock Company, and the Millwall Dock Company, and of the powers, rights, duties, property, and liabilities, or some of them, of the Conservators of the River Thames, and of the Master Wardens and Commonalty of the Watermen and Lightermen of the River Thames, commonly called the Watermen's Company, and of the Court of Master Wardens and Assistants of the Watermen's Company, and for conferring on such public authority various rights and powers for the management of the undertakings proposed to be transferred, and of the Port and Docks of London and any other matters proposed to be transferred or vested in such public authority under the Bill, and for making the necessary financial provisions in connexion therewith, and for defining the Port of London for the purposes of the Bill."

The recommendation was adopted.

Housing of the Working Classes.—Mr. Bruce, the Chairman of the Housing of the Working Classes Committee, informed the Council that accommodation had been provided during the last six months for 3,502 persons of the working classes.

Main Drainage Extension: Southern Outfall and High Level Sewers.—The Main Drainage Committee reported that they had considered tenders for the construction at Plumstead of a portion of the new southern outfall sewer

No. 2, and of a portion of the new high-level sewer No. 2. The following are the tenders:—

J. Smith & Co.	£119,136	14	10
J. Watt	115,515	3	6
S. Pearson & Son	114,010	1	3
Price & Reeves	113,946	12	9
R. McAlpine & Sons	107,440	3	0
Bentley & Lock	106,474	13	4
A. N. Coles	93,661	4	8
J. Bentley	93,157	17	5
J. & T. Bians	92,455	19	1
J. Mowlem & Co.	89,907	16	6
J. B. Squire & Co.	85,711	12	3
W. Kennedy, Ltd.	84,607	15	9
Muirhead, Greig, & Mathews	83,306	15	7
J. Cochran & Sons	82,344	7	8
Westminster Construction Co.			
London*	81,285	19	0
J. D. Nowell & Son	68,377	17	7

(Chief engineer's estimate of the cost of the work was £91,727 7s. 2d.)

Sir W. Collins said he thought some explanation should be given as to why the lowest tender had been passed over, especially as Messrs. Nowell were already carrying out a contract for the Council.

Colonel Rotton moved that the recommendation be referred back, and stated that, if they were to give up accepting the lowest tenders, they might just as well give up calling for tenders.

Mr. Harris wanted to know why the job had not been offered to the Works Department, who would, of course, be able to do it cheaper than contractors.

Mr. Ward urged the Council to adopt the Committee's recommendation, on the ground that next week the Committee would propose that Messrs. Nowell should be given another job.

Mr. McKinnon Wood considered that there should be some very strong reason given why the lowest tender should be passed over.

Mr. Goodman, the Chairman of the Committee, said the engineer had advised that the job was a very difficult one, and the Council must take upon itself the responsibility of interfering with the Committee's recommendation.

The amendment was, however, carried, and the matter was referred back.

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Kensington, South.—Retention of an iron and glass covered-way in front of No. 20, Bolton-gardens, Walsley-road, South Kensington (Mr. W. Hancock).—Consent.

St. George, Hanover-square.—Buildings upon the site of Nos. 44, 45, and 46, Old Bond-street, and Nos. 57, 58, 59, and 60, Piccadilly, St. George, Hanover-square, of projecting shop fronts and two three-story oriel windows on the Bond-street frontage, and projecting shop fronts, balconies at the second and third floor levels, and three-story oriel windows on the Piccadilly frontage (Messrs. Read and MacDonald) for Messrs. Callard, Stewart, and Watt, Ltd.).—Consent.

Fulham.—The retention of projecting porches and balconies at Nos. 2 to 48, Finlay-street, Fulham (Mr. R. B. Mason).—Consent.

Fulham.—The retention of projecting porches and balconies at Nos. 1 to 47, Finlay-street, Fulham (Mr. H. Terry).—Consent.

Greenwich.—Buildings on the southern side of Kidbrooke-gardens, Kidbrooke-grove, Blackheath (Mr. A. Mitchell Torrance for Sir John McDougall).—Consent.

Hampstead.—An iron and glass shelter at the front entrance to "Eagle's Nest," Haverstock-hill, Hampstead, an iron and glass shelter at the side entrance in England-lane, and an iron and glass roof in front of the coach-house at the rear of the building (Mr. L. Sharp for Mr. G. Munro).—Consent.

Marylebone, East.—A projecting clock in front of No. 138, Oxford-street, St. Marylebone (Mr. C. H. Mead for the Alexander Clark Manufacturing Company).—Consent.

Paddington, South.—An addition to the existing one-story shop at No. 95, Westbourne-grove, Paddington, to abut upon Monmouth-road (Mr. G. Neal for Mr. J. Harries).—Consent.

Southwark, West.—A two-story building, and the raising of a boundary wall on the south side of Southwark-street, Southwark (Mr. J. T. Woodard for "Chocolate Menier").—Consent.

Wandsworth.—A projecting angle buttress No. 10, Balham-park-road, Balham (Mr. J. Tarrant for Mr. W. Borders).—Consent.

Wandsworth.—Houses on the north side Church-lane, Tooting (Mr. W. Bartholomew).—Consent.

Holborn.—An open letter sign at No. 71, High Holborn (Mr. L. Freedman).—Consent.

Hampstead.—Enclosures to the porch No. 25, Langland-gardens, Hampstead (Mr. J. D. Hunter for Mr. A. Drew).—Consent.

Hammersmith.—Certain woodwork in erection of bay windows at the "Nelson" beer-house, Masbro'-road, Hammersmith (Messrs. N. Parr and A. E. Kate for the Royal Brewery, Brentford, Ltd.).—Consent.

Hammersmith.—Retention of a wood glass showcase at No. 248, King-street, Hammersmith, abutting upon Ravenscourt-avenue (Mr. G. Trotman for Messrs. Kennedy Clarke).—Refused.

Marylebone, East.—A porch and an iron and glass enclosure to the area steps at No. 8, Cavendish-square, St. Marylebone, to abut upon Cavendish-place (Mr. W. H. White for Dr. H. Morris).—Refused.

Width of Way.

Hackney, Central.—That the application of Mr. G. H. Lovegrove for Messrs. J. King & Co., Ltd., for an extension of the width within which the erection of a warehousing building on the site of Nos. 74 and 76 Beauvoir-crescent, Kingsland, with external walls at less than the prescribed distance from the centre of the roadway of Hertford-road, was required to be commenced and completed, be granted.—Consent.

Hackney, North.—A building on the north side of a roadway leading out of the north side of Farleigh-road, Hackney, between Nos. 3 and 5 (Mr. G. H. Capper for Mr. A. Jackson).—Refused.

Width of Way and Lines of Frontage.

Greenwich.—A one-story addition to a coach-house and stable building at the rear of No. 1, Shooter's-hill-road, Blackheath, abut upon Vanbrugh-terrace, and the leading therefrom (Mr. A. W. Watkins for Mr. E. Wisler).—Consent.

City.—A building on the site of Nos. 4 and 6, Copthall-avenue, City (Messrs. E. Rantall for Messrs. J. Chessum and Son).—Consent.

Hammersmith.—A parish hall, on the east side of Great-church-lane, Hammersmith (Mr. W. D. Caroe for Rev. J. Parry).—Refused.

Width of Way, Line of Frontage and Construction.

Hammersmith.—A gangway over Wood-lane, Hammersmith (Mr. I. Kirally for the British Empire Exhibition).—Consent.

Uxton.—Iron balconies connecting premises at Merritt's-buildings and Clarendon, Hoxton (Messrs. Gale, Durlacher, Emmett for the Home and Colonial S. Ltd.).—Consent.

Lines of Frontage and Deviation from Lined Plans.

Strand.—Buildings upon the site of Nos. 36 and 36A, St. James's-street, and 64, Jervis-street, St. James's (Mr. W. Woodward for L. Thomas).—Refused.

Space at Rear.

St. George, Hanover-square.—Deviation from the plan certified by the District Surveyor so far as relates to the proposed erection of a building on the site of No. 23, Bolton-street, of an addition to the Curzon Hotel, Curzon-street, Hammersmith (Messrs. S. J. Waring and Son).—Consent.

Formation of Streets.

Hampstead.—A deviation from the plan sanctioned on September 3, 1903, for the formation or laying-out of new streets for carriage traffic upon the Burgess estate, Finchley-road, Hampstead, so far as relates to an alteration in the gradient of certain of the streets (Messrs. Brown Barrow).—Consent.

Cubical Extent.

Hammersmith.—A subway being formed at the basement level to connect Nos. 2 and 5 at the Manbré charine Works, Brandenburg-road, Hammersmith (the Manbré Saccharine Company).—Consent.

Southwark, West.—Additions to a building on a site on the east side of Hatfield-road, Southwark (Messrs. E. Matcham and Co. for Messrs. Hudson and Kearns).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

GENERAL INSTITUTE OF ARCHITECTS OF IRELAND. Annual meeting of members was held in the Institute Rooms, 20, Lincoln-place, Dublin. George C. Ashlin, President, occupied the chair.

A letter was read from Mr. Pinkerton, Secretary, having reference to the existing state of professional charges and suggesting alterations in it. The Chairman explained the meeting was not competent to adopt a resolution relative to such proposed change, and invited a general consideration of the subject. An animated discussion followed, in which Mr. James H. Webb, Mr. George L. Nor, Mr. Murray, Mr. Allberry, and others took part. It was alleged that the rules laid down in the Institute schedule governing members' charges were constantly transgressed, and that it was not absolutely in letter, at any rate in spirit. The speakers called upon the members to take vigorous action in this matter, and to protect those, especially the younger architects, who were loyal to the Institute, and the best traditions of practice. The Chairman announced that, in his opinion, the present constitution of the committee of the Institute of British Architects, having regard to the proposed scheme of registration of architects gave good hope of a speedy and successful conclusion of this most important question.

COMPETITIONS.

STEVENS HALL, WESTMINSTER.—We are informed that 122 sets of plans have been received for this competition.

BOOKS RECEIVED.

THE STABLE: THE DOWNS AND THE DISTRICT. By W. G. Worthington & G. Smith. (The Homestead Edition, 1s.)

HISTORY OF ENGLISH FURNITURE. By Macquoid. Part I. (Lawrence and Co. 7s. 6d. each part.)

TECHNICAL AND WAGES. Part I., Foreign and Domestic. By Sydney J. Chapman. With introduction by Lord Brassey. (Longmans, Green & Co. 1904.)

ESSEX COLOUR PRINTS. By E. F. Strang. Edited by the Board of Education.

STREETS: LAYING OUT AND MAKING UP. By Taylor Allen. (The Sanitary Publishing Co. 1904.)

Correspondence.

LIABILITY OF COUNCILS FOR SANITARY INSPECTORS' ERRORS.

Your correspondent, Mr. Hudson, was very laudable in his remarks on the injustice of the decision arrived at by Judge Addison, in the case of Johnson v. Bermondsey Sanitary Authority.

The general principle involved in the decision is that the accredited agent of a public body has power to put property to an indefinite expense simply if he is of opinion that the sanitary arrangements of the premises are defective; and that he should have made a mistake, and that he must pay for it.

The power such as this can only be justified by the demoralisation of those who are entrusted with it. J. A. GLAZIER.

GREENSTEAD CHURCH.

The interesting article on Greenstead Church (The Builder, October 8) suggests that the church was erected by the bearers of the relic of St. Edmund as a suitable resting-place, because it was out of the way and in the woods.

Studies of the course of ancient Essex roads to a contrary conclusion. I am sure, however, that one may be easily traced, and offer my views for what they are worth.

Rev. J. B. Mackinlay, in his book "St. Edmund and Martyr," 1903, speaks of the relic of the saint's remains as a "relic of great progress to Beodricsworth," and that it was no longer necessary to keep the relic by roads to avoid observation, and, owing, apparently, to the annals of Hermonk of Bury, he says "the body of St. Edmund [at Greenstead] for some days in the woods to satisfy to devotion of the faithful."

I am inclined to agree with him as to the date of the site, because, if I read the account of the relic, Greenstead, a not inconsiderable village, was situated on the King's road from London to Suffolk and Norfolk means secluded from observation, and that the period in question (A.D. 1015)

Greenstead was of some importance, Ongar was of none, and was approached by a side road branching from the King's highway at Greenstead. (You may follow its course now by the pretty footpath between the two places.) Ongar, if I am right, and I judge partly by Domesday evidence, was but a poor place till Count Eustace obtained it from William I., and probably continued so till Richard de Luci made it the caput of his Honour of Ongar when he was allowed to create his great castle there in the XIIIth century.

Probably the market was established by him, and gave the old, but still current, name of Chipping to the place.

I fear to make this letter too archeological for your columns, but must add that the place now called High Ongar was, and is, territorially of far more importance than Chipping Ongar, and may well have given the name to the Saxon Hundred, though not the Norman Honour.

I trust you will permit me to express my sense of the obligations to you that archeologists are under for the admirable studies of Essex churches recently published by I. CHALKLEY GOULD.

THE STUDENT'S COLUMN.

The Chapter XL, in our last issue, of "Notes on Portland Cement" concluded the series of articles on this subject. The "Student's Column" articles will recommence at the commencement of the next half-yearly volume with a new subject.

METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of the Managers of the Metropolitan Asylums District was held on Saturday last week at the offices, Victoria Embankment.

A communication was received from the Local Government Board assenting to the alterations and additions which it is proposed to make to the Medical Superintendent's house at the North-western Hospital. The work will cost some 230l.

North Eastern and North Western Hospitals.—On the recommendation of the Finance Committee it was agreed to apply to the Local Government Board for an order authorising the Managers to incur an expenditure, not exceeding the sum of 1,120l., on the erection of engineers' cottages at both of these hospitals.

Southern Hospital.—The Works Committee reported that they had approved of the proposal of the architects to construct a rain-water reservoir at this hospital to hold about 175,000 gallons, at an estimated cost of about 1,600l., as against 500l. in the contract, which provided only for a reservoir to hold 40,000 gallons and to receive a portion only of the rain-water.

The approval of the Committee was endorsed.

Leicester Asylum.—The Asylums Committee recommended, and it was agreed, that certain alterations to windows at this asylum should be carried out, with the idea of providing means of escape in case of fire. The number of windows to be altered is sixty-four, the estimated cost being 346l.

Joyce Green Smallpox Hospital.—On the recommendation of the Hospitals Committee it was agreed to carry out internal painting works at this hospital. The portions of the building to be treated are the staff blocks and the pavilions. The cost is estimated at 3,600l.

OBITUARY.

Mr. FURSE.—We greatly regret to announce the death on Monday last, in his thirty-seventh year, of Mr. Charles Wellington Furse, A.R.A. Mr. Furse, the third son of the late Canon C. W. Furse, Archdeacon of Westminster, and of Halsden House, North Devon, was educated at Haileybury College, whence he proceeded to the Slade School, under Professor Legros, where he won the Slade Scholarship; he then went to Paris, and afterwards to Munich, where he gained the gold medal. Until the opening of the Royal Academy Exhibition in 1903 Mr. Furse was but little known beyond the limits of the New English Art Club and a comparatively small circle of fellow-artists and art-lovers. In that year he contributed portraits of Lieut.-Colonel Sir J. J. White-Jervis and Lord Charles Beresford, and the portrait-group, "The Return from the Ride," of Mr. and Mrs. Aubrey Waterfield, to which the hanging committee had accorded a well-deserved place of honour. His success on that occasion was followed by his election to the first vacant associateship of the Royal Academy. Last summer he exhibited "The

Lilac Gown," a study of colour in the picture, half-length, of a lady (Miss Mabel Terry-Lewis) with a sunshade, and "Diana of the Uplands," a girl clad in a grey silk dress, which is blown by the wind, and holding two hounds by a leash, in the midst of a wild landscape, with wind-driven clouds. In last June Mr. Furse was commissioned to paint a portrait of Dr. Daniel for presentation to him in commemoration of his accession to the Provostship of Worcester College, Oxford, and was recently engaged upon a portrait, which he leaves unfinished, of Mr. Joseph Chamberlain, M.P. Four years ago Mr. Furse married a daughter of Mr. John Addington Symonds, of Clifton Hill House, Bristol, whose likeness is depicted in "Diana of the Uplands." Of his other principal works should be mentioned a half-sized equestrian portrait of Field-Marshal Lord Roberts; the presentation portrait of Professor Skeat; and a portrait of the late Bishop Stubbs.

Mr. DAVISON.—The death has just taken place at St. Peter's Hospital, London, of Mr. Thomas Vincent Davison, C.E., from the effects of a painful operation after much suffering. Mr. Davison was the late Borough Surveyor of Windsor, to which post he was appointed in March, 1871, by the Town Council. In March, 1897, he retired from the Borough Surveyorship and retained the appointments of Inspector of weights and measures, foods and drugs, and workshops and factories, down to his death. Before coming to Windsor Mr. Davison was formerly a surveyor in the Royal Engineers on the civil staff. He was an Associate Member of the Institution of Civil Engineers, London. —*Windsor and Eton Express.*

GENERAL BUILDING NEWS.

LIVERPOOL CATHEDRAL.—It is stated that the contract for the foundations of Liverpool Cathedral has been secured by a local firm—namely, Messrs. Morrison and Sons, of Warrington.

CHURCH, CURRAHA, COUNTY MEATH.—The new church at Curraha, near Ashbourne, Co. Meath, is in Gothic style, and has been built by Mr. James M'Adorey, of Dundalk, from the designs of Mr. G. C. Ashlin, R.H.A. The high altar and two marble side altars were erected by Messrs. Early. The altar railings and sanctuary lamp are the work of Mr. John Kane. There are five stained-glass windows.

CHURCH, NEWTON ABBOT.—The foundation-stone of a new church for the parish of Highweek, Newton Abbot, was laid on the 13th inst. The new church will be erected on the spot on which Abbotsbury House formerly stood, and it will consist of nave, north and south aisles, and chancel, and seating accommodation is to be provided for 750 persons, including the choir. The main walls are to be of Stoneycombe limestone. The windows and tracery will be of Bath stone. The Nine buttresses will support each of the main walls, and the two aisles will be lighted by six windows. Of the three windows to be placed in the east end, the centre one will be that containing the allegorical work now in St. Mary's chapel-of-ease. There are also to be three windows in the west end, besides several smaller ones in different parts of the church. The roof is to be of Delabole slate, and ridge tiles of slate colour, and the main ribs are to be of Baltic pine. The two main entrances will be through porches on the north and south sides, with granite steps and stonework similar to that in the main building. The font is to stand in the baptistry between the two entrances. The nave and north and south aisles will be 96 ft. 6 in. long and 59 ft. 9 in. wide. The dimensions of the chancel will be 35 ft. by 31 ft., with a 4-ft. passage at the back giving access to the vestries. The clergy vestry is to adjoin the supplementary choir, and the choir vestry is to be opposite, both 11 ft. 6 in. by 20 ft. The heating chamber, 11 ft. 6 in. by 9 ft., is to be under the clergy vestry, and it will be entered from the exterior of the church. The interior lining of the main walls will be of Bath and Beer stone. The piers, the seven pillars on either side of the nave, and other work forming the arcades, will likewise be of Beer stone. The nave, aisles, and vestries are to be of wood-block flooring of Oregon pine, and the chancel floor is to be concreted preparatory to being laid with tiles. The piers include a tower with spire, which is to rise to a height of 200 ft., but its erection is not contemplated for some time. Mr. E. Sedding, Plymouth and London, is the architect.

SCHOOL, SHEFFIELD.—On the 14th inst. Lord Londonbury declared the new Council school, in Hammerton-street, Stanforth-road, open.

The school is in two departments. The infants' block, for 340 children, faces Hamerton-street, and the building for the senior mixed department fronts to Ouseburn-road, and has accommodation for 540 children, excluding the floor area of the central hall. The infants' school has six classrooms arranged round a central corridor, four of the rooms being separated from the corridor by movable partitions. The senior school has a central hall, 66 ft. by 35 ft., with nine classrooms grouped round it, each for sixty children; there are glazed movable sashes between the hall and classrooms. The walls are faced externally with coursed Bole Hill rock, with dressings of Stoke ashlar, and the roofs are covered with dark Westmorland slates. The work has been carried out within the amount of the contract—15,939. The architect was Mr. W. J. Hale, of Sheffield.

SCHOOLS, BOURNVILLE.—A tender by Messrs. J. Bowen and Son, of Balsall Heath, of 19,500l., has been accepted for the erection of elementary day schools for Bourneville. The schools are designed by Mr. Alexander M. Harvey, the Consulting Architect to the Bourneville Trust, and the style is a free Gothic treatment. They will stand in 2½ acres of ground in the centre of the village, with the triangular green in front. The park is on the one side, Thorn-road on the other, and village gardens at the back. A tower will rise to a height of 60 ft. Special accommodation is provided for instruction in laundry work, cookery, carpentry, and other handicrafts, and, in addition, a library and laboratory are to be provided. The number of school places which will be provided is 540, and eventually another school for 270 infants is to be erected. The main block, for boys and girls, will be completed, however, before the erection of the last-named school is entered upon.

SUNDAY SCHOOL, BRADFORD.—The foundation-stone has just been laid of a new Sunday school and parochial hall in connexion with St. Clement's Church, Bradford. The total estimated cost of the school is 3,500l., but it has been decided to proceed with that portion of it which is most urgently needed—namely, the assembly and classrooms. This is estimated to cost about 2,400l. Plans by Mr. Horace E. Priestley, architect, Bradford, were accepted. The building will be Gothic in style, and one story high, the main features being an assembly hall and a smaller room to seat 200 children, sixteen classrooms, and a basement available for gymnasium.

TECHNICAL SCHOOL, TYLDESLEY.—A new technical school has just been opened at Tyldesley, Lancashire. The principal elevation fronts Upper George-street and is Renaissance in style, the material used being pressed red stock facing and stone dressing. The floors are of concrete, and the gymnasium and classroom floors are finished with wooden blocks. In the basement are a gymnasium, 54 ft. by 26 ft., ambulance-room, 59 ft. 6 in. by 24 ft., store-room, 25 ft. by 14 ft. 6 in., heating chamber, 12 ft. 6 in. by 13 ft., and coal store, 10 ft. by 13 ft. Access to this floor is provided by a main staircase built of stone and by a ward entrance. On the ground floor are five classrooms, 26 ft. by 26 ft., 26 ft. by 16 ft., 26 ft. by 26 ft., 26 ft. by 26 ft., and 24 ft. by 21 ft. respectively, secretary's office, 15 ft. by 11 ft., and waiting-room, 11 ft. by 7 ft. Gentlemen's cloak-room and retiring-rooms are provided. The first floor extends the whole frontage to Upper George-street, and contains a lecture hall, 61 ft. by 27 ft., a classroom, 26 ft. by 16 ft., chemical lecture theatre, 26 ft. by 27 ft., and ladies' cloak and retiring rooms. The corridors are finished with mosaic. The woodwork and the internal finishing are of pitch-pine. The heating is by hot water. The contractor for the building is Mr. J. H. Wilson, and the brickwork has been executed by Mr. J. Bridge, of Walkden, the lighting and plumbing by Mr. H. Baxendale, Tyldesley, and the block floors by Messrs. R. Lowe, Ltd., Farnworth. The architect was Mr. J. Holt, C.E., of Manchester.

PUBLIC HALL, THURNSCOPE, NEAR DONCASTER.—A new public hall has been erected in this village. The body of the hall is 55 ft. long by 33 ft. wide and 15 ft. 6 in. high. It is built of brick, relieved with stone, and in the front there is a porch and a lobby. Inside there are two classrooms situate at the rear of the building, and a scullery. The classrooms and hall can be divided by movable partitions; whilst there is also a movable platform. The classrooms are heated by fireplaces whilst the heating apparatus for the hall is on the low-pressure system, with pipes and radiators, which have been fixed by Messrs. Wright Brothers, of Sheffield. The building is lighted by gas throughout, and accommodation is provided for 400 people. The contractors for the work are Messrs. Thornton and Sons, of Rotherham, and Mr.

R. Higginbottom, of Thurnscoe, has been the architect.

THE CITY CREMATORY, LONDON.—The crematorium at the City of London Cemetery will shortly be opened for use. The building has been erected from plans and designs made by Mr. Andrew Murray, the late Surveyor to the Corporation, and approved by the Home Secretary. The civic authorities will submit their proposed regulations and charges for approval by the Local Government Board; they also propose to take powers under the Cremation Act of 1902 for disposing of the remains of persons dying of plague, cholera, or yellow fever within the limits of the Port of London, and to appoint Dr. Collingridge and Dr. Gordon Browne as honorary medical referees.

WESLEYAN MISSION HALL, SEATON HIRST.—A new Wesleyan mission hall, to accommodate 400 persons, is being erected at Seaton Hirst at an estimated cost of 1,925l. The front (and larger) portion of the site is being reserved for the erection of a church, the whole scheme costing 3,500l. The plans of the proposed edifice have been prepared by Mr. J. Walton Taylor, architect, of Newcastle, the present contract being let to Mr. T. A. Turnbull, of Rowlands Gill. The buildings are Early English in style, and comprise a mission hall with transepts capable of seating 650 persons, the main entrance to which is Milburn-terrace. The building not being proceeded with is the schoolroom, and adjoins the hall. It will accommodate 350 persons, and the principal entrance is in Seventh-avenue, connected to the hall by a corridor from which access is gained to a minister's vestry and lavatory. At the rear of the schoolroom are kitchen, vestry, and classroom, with heating chamber under. These are to be used in conjunction with the caretaker's house, where religious services have for some time been conducted. The walls are to be built of selected facing bricks, with stone dressings. The heating will be by hot water on the low-pressure system.

NEW MARKET, OLDHAM.—The new market at Oldham, the foundation-stones of which were laid a short time ago, will comprise a market hall and shops surrounding, and on two sides occupies a site aligned by Albion and Henshaw streets and the old market ground. It has been designed by Messrs. Leeming and Leeming, architects, of London, based upon measurements and particulars supplied by the Markets and Baths Committee of the Corporation. Mr. David Blunn, Oldham, is clerk of the works. The measurements of the building will be 169 ft. by 109 ft. 4½ in. The surrounding shops will be arranged with frontages and windows in the hall. The new structure will be put up in two portions, so as to allow of the present old Victoria Market to remain standing until the first half of the new building has been completed. There will be three entrances to the market, one each from Albion and Henshaw streets, and one from the market ground. The interior of the building will be fixed with glazed bricks, and will be ornamented with the iron and glass fronts of the shops. The roof will be of iron covered with slates of imperishable glazing, the latter having lead coverings. The work will be carried out in Accrington brickwork, with Yorkshire stone dressing. Mr. Edward Stephenson, of Oldham, is the chief contractor.

MUNICIPAL BATHS, CAMBERWELL.—On Tuesday last week, at the invitation of the Mayor of Camberwell and the members of the Public Health Committee, a party of visitors inspected the Old Kent-road Public Baths, which are now approaching completion. The building, which faces the main road, is being built by Mr. A. N. Coles, from the designs of Mr. Harding Payne. Two large swimming baths will be provided, and slipper baths, and a Turkish bath, and a Russian vapour bath.

AYR WORKING GIRLS' INSTITUTE.—An institution intended for the use of working girls in Ayr was opened on the 11th inst. by Sir James Fergusson, M.P. The institute, which is a three-story building, was designed by Mr. William McClelland, architect, Ayr, in James-street, at its junction with George-street, is intended for the board and lodging of twenty-eight girls, and otherwise as a club for any working girl who chooses to join it, there being a dining-room, drawing-room, boarders' sitting-room, and hall on the ground floor, with the sleeping accommodation on the two upper floors.

COUNTY COURT BUILDINGS, MIDDLESBROUGH.—The business of the Middlesbrough County Court has been transferred from the old premises in North-street to new buildings in Wilson-street West, in the centre of the town. The new structure, which has cost 12,000l., has been erected to the designs of Mr. H. N. Hanks, of H.M. Office of Works. It is con-

structed with Accrington brick, with facings. On the ground floor are the offices, fireproof storeroom, and the assistant registrar's rooms, etc., and the first floor are the registrar's and courts, with retiring-rooms, solicitors' etc., whilst above these accommodations provided for the caretaker. The contract was given to Mr. J. Davidson, Stockton, Mr. J. sons, of H.M. Office of Works, being the works. The work has been carried out by the undermen firms—Plumbing, J. Cuthrie, S. painting, Jordan and Adamson, S. plastering, Bolton and Mawson, West pool; heating, W. Richardson, Dan fittings, Fielding and Bottomley, J. electric lighting and ventilating, Methuen, and Co., Manchester; st. Dorman, Long, and Co., Middlesbrough, fixed by Baker Bros., Middleborough.

LAING ART GALLERY, NEWCASTLE-ON-TYNE.—Lord Ridley opened, on the 15th inst. Laing Gallery, Newcastle. The building is two stories in height, forming a square, the ground floor consisting of entrance and sculpture hall, and three museum galleries extending throughout the public library, and lighted from a court; the upper floor being entirely up with top-lighted art galleries, number, and averaging in size about 27 ft., by 27 ft. up to the top of the ceiling. The main façade is to Highgate, and the corner formed with the library south-east angle, is occupied by a tower square and 112 ft. high, which contains grand staircase. The staircase is from the sculpture hall, the main entrance which is about the centre of the Highgate front. The floors throughout are composed of concrete, in the case of the upper combined with expanded metal on steel. The surface of the floor of the entrance is of polished marble pavement, and of the galleries is of polished oak block. The north end of the buildings are receiving-rooms, a private staircase, picture hoist. The design externally, out in ashlar, is Renaissance in style, the ground floor forming a rusticated pilaster same height as the library. Upon detached Ionic columns projecting either flank and carrying the entablature, semi-circular arched pediment, in which sculptured niches. The main entrance wide, flanked by double detached columns with pedimented entablature with sculptured figures on either side tower has a band of sculpture on the faces, immediately under the latter latter being octagonal and supporting dome about 20 ft. in diameter. The decoration is on the plenum system. The architect of the new gallery were Messrs. C. Burns Dick, and the contractors were J. and W. Lowry, Newcastle.

COUNTY ASYLUM, LANCASHIRE.—The Lancashire Asylums Board has for some time been considering the provision of an asylum, capable of accommodating 2,000 persons. The scheme has been drawn up "colony" system, which is expected to cost a saving of 20,000l. on the "corridor" system. We are informed that the Lunacy Commissioners have given their sanction to the scheme, which will be proceeded with by Mr. Littler, of Preston, is to be the asylum is to be erected at Lang Blackburn.—*Manchester Courier.*

Y.M.C.A. BUILDINGS, BIRMINGHAM.—The 13th inst. the Duke of Argyll opened a building which has been erected by the Men's Christian Association in Dalmeida-street, Birmingham. The five-story terra-cotta building includes a hostel with forty bedrooms, lounges, and dining-halls, and the hall is to be available for the use of the public. Educational classes and halls for religious purposes are provided and there is a gymnasium, with plunge, and spray baths. The youths' club at the rear of the principal building, is complete in itself. The cost, costing 6,500l. gift from Mr. George Cadbury, and the architect was Messrs. Ewen Harper and Sons, of Birmingham.

MEMORIAL INSTITUTE, WALKERBURN.—On the 1st inst. the new Ballantyne Memorial Institute at Walkerburn was opened. The building comprises a lower story with a reading-room and two tables, reading-games-room, etc., for males, and an upper story for ladies, which contains a reading-room, sewing-room, cooked food, etc. Mr. Dunn, architect, Edinburgh, prepared the plans for the building.

NEW LIBERAL CLUB, KEIGHLEY.—A Liberal club for the North-East of England, was opened recently. The club is situated in Bradford opposite

a Park entrance, and has been erected on plans prepared by Messrs. John Haggas and Keighley.

N HALL, STROCKPORT.—The Mayor of Strickland (Alderman Giles Atherton) on Monday last week laid the foundation-stone of the new town hall for the borough. Mr. Drumwell Thomas, of London, was awarded the first premium of 100*l.* for designs, and was subsequently appointed architect of the building, whilst the contract was let to Messrs. Briggs, whose tender amounted to 10,000*l.* The site of the new town hall is in the town-road. The building will be of red stone, and will rise in the main to a height of 40 ft., and the clock tower to 110 ft. The site of the Council suite of apartments is placed in the one centre block surmounting a spacious ante-room, including the Council chamber, 56 ft. by 30 ft., and a coming-out suite of committee-rooms, the total area being 54 ft. by 30 ft. One of the main rooms of the building will be a large hall on the upper ground floor to accommodate 1,500 persons. All the hall corridors are to be paved with marble and mosaic; other floors with wood.

N HALL, HIGH WYCOMBE.—The opening of the new town hall at High Wycombe took place recently. The building has been designed from plans by Messrs. Bateman, Hunt and Son, of Birmingham, and was selected in competition by Mr. Collcutt, the assessor. The architects were instructed to prepare the necessary plans for the first portion of the scheme to be executed and the tender of Messrs. Hunt and Son, High Wycombe, was awarded, the works being commenced in May, 1903. Mr. Joseph Fishburn has acted as clerk of works. Owing to the death of Mr. Bateman soon after the commencement of the work, Mr. C. E. Bateman, his son, has since been in charge of the building work. The general dimensions of the building are 81 ft. 6 in. long, by 53 ft. wide, with a central hall, stage, dressing-rooms, etc., are provided. The elevation of the building facing Queen Victoria-street is of red bricks and Portland stone. There is a stone up to the first floor level, and the two end portions are carried right up to the roof level, terminating with carved panels beneath the eaves. The outside of the first floor are red bricks, with a stone reveal and heads to the side of five of which light the supper-room. There is a cornice of Portland stone between the first floor and the second floor window, and stone cornice to the eaves. The roof is covered with Colley Weston stone slabs, and is topped with a turret painted white, and is finished at the apex of copper. The approach to the building is by three entrances, through which give access to the entrance lobby; beyond them are oak screens with leaded glass. From the entrance hall, which is 52 ft. by 30 ft., is a staircase leading to the upper part of the building. The staircase is a feature of the new building, being of Hopton Wood stone; the spandrels are of polished stone. The upper portion is carried by polished Hopton Wood columns, whilst the fireproof floor is supported by girders. The floors of the entrance hall are of the same stone. Lead-in the entrance hall, on either side, are ladies' and gentlemen's cloak-rooms, and these staircases run down to the ladies' and gentlemen's lavatories in the front base. The main or grand hall is laid with wood and secret nailed boards. At the end of the building there is a stage, fine proscenium arch. The ceiling of the hall is in the form of an elliptic arch, divided into seven panels, with cornices decorated with floral enrichments. Underneath the hall there is a large accommodation for the storage of chairs and other purposes. On the first floor is a supper-room, at the end of which there is a "servery," whilst at the other end is "the Mayor's ante-room." At the east end of the building there are oak benches. On the second floor are the caterer's kitchen, larders, etc., and are the caretaker's suite of rooms. On the other side of the front portion of the building is a lift running up from the basement to the second floor. The corridor throughout is of mosaic with borders in original designs, whilst in the centre at the end are arranged in mosaic fashion the visitations of the Borough Arms. The lighting apparatus has been supplied by the High Wycombe Gas Light and Coke Company, and is capable of burning 100 per cent. in the cooking-room is one of David's Patent Company's gas ranges. The heating arrangement, which is a low-pressure system, surrounding the entire building has been carried out by Messrs. C. N.

Haden and Sons, engineers, of Birmingham and Trowbridge. The electric light fittings are by Mr. J. Fletcher, of Key Hill, Birmingham. The wiring has been carried out by Messrs. Higgins and Griffiths. At each side of the hall there are ornamental iron gates, opening between Portland stone pillars, with arched heads, finished at the top with protecting columns. The iron gates, etc., have been supplied by Messrs. Hart, Son, and Peard, of London and Birmingham.

NURSES' HOME, ROCHDALE.—The Countess of Derby has just opened a new Nurses' Home at Rochdale, built as a memorial of Queen Victoria. The building is faced with Huncote plastic bricks, relieved with polished stone dressings from Stancliffe Quarry, Darley Dale. The roofs are tiled. It is fitted throughout for electric lighting. The floors are boarded, with the exception of the entrance hall and a portion of the corridor on the ground floor, which will be done in oakwood block flooring. Messrs. Woodhouse, Willoughby, and Langham, of Manchester, are the architects.

COUNCIL BUILDINGS, KEMPSTON, BEDFORDSHIRE.—Built by Messrs. B. Litchfield and Son to the design of Mr. E. H. C. Inskip, the Surveyor to the Council, these offices have a frontage of some 40 ft. The red-brick front is surmounted by ornamental stone-work bearing the words, "Kempston Urban District Council, 1904." The entrance is on the left. There is a vestibule with double doors, while the floor is of tessellated pavement. On the right is the surveyor's room, 14 ft. by 18 ft. Behind it is a room of similar dimensions, which is the clerk's office. Between this and the surveyor's room is a strong-room has been constructed. Upstairs there is a small landing with a cloak-room, and another room, both opening into the Council Chamber. This hall occupies the full length of the building. It is 35 ft. long and 18 ft. wide, the height being 12 ft. up to the slope of the roof, which ends in a flat 10 ft. wide.

PROPOSED NEW THEATRE IN BOTCHERGATE, CARLISLE.—Plans of a proposed theatre in Botchergate are being drawn by Messrs. Owen and Ward, of Birmingham. The theatre, which it is proposed shall be built on the site of the Old St. Cuthbert's Vicarage, is to have entrances from Botchergate through the Arcade, from King-street, for which purpose a block of cottage property has been purchased, and from Lancaster-street, to which the site extends backward.

NEW INSTITUTE BUILDINGS, CLAPWELL, DERBYSHIRE.—The new premises of the Clapwell Institute, which were opened a short time ago, have been erected at a cost of 2,500*l.* The original architect of the structure was the late Mr. Wild, of Sharrow, Sheffield, and upon that gentleman's decease the work was taken up by Mr. Beale, Mr. C. Oakley, of Hill-street, was the contractor.

HOSPITAL SCHEME, LEEDS.—The Workhouse estate in Beckett-street, Leeds, is undergoing a transformation. In the main building there are a hundred more inmates than the authorities have proper accommodation for, while the provision available for dealing with the sick and infirm poor has long been inadequate to meet the requirements of the Union. This has caused the Guardians to embark on a scheme of hospital extension. Plans have been approved by the Local Government Board for the erection of a new kitchen and general stores, receiving and serving rooms, sick wards for males (186 beds), sick and venereal wards for females (183 beds), maternity wards (twenty-six beds), infectious diseases wards for ten males and a similar number of females, and children's wards containing sixty-six beds, together with an operating theatre and a mortuary. Altogether accommodation is provided for the treatment of 500 cases. The old industrial schools, which are thus being first adapted to fresh needs, are intended to form one of a series of several new blocks which are to be built on the Beckett-street estate. They are undergoing entire reconstruction, and new wings are to be added for the purpose of dormitories. The remaining blocks will be proceeded with in sections as soon as the one in hand is completed, so as to allow of the removal of patients from the overcrowded old buildings that have to come down to make the necessary room. Part of the scheme is the extension of the nurses' home, which was built about a dozen years ago to accommodate forty trained nurses. The number of nurses engaged in the institution is now sixty, and to meet the general requirements of attendance upon the sick cases under the care of the medical staff further provision is, of course, needed. Mr. T. Winn is the architect.

HOSPITAL, BIRMINGHAM.—A sub-committee of Birmingham Health Committee recently in-

spected, at Little Bromwich, the hospital extensions which have just been carried out at a cost of upwards of 20,000*l.* These extensions comprise the provision of three permanent pavilions, an isolation pavilion, and a large block of buildings for the accommodation of nurses. It is proposed to devote the three pavilions, which, in the aggregate, will provide accommodation for about seventy-two additional patients, to the treatment of typhoid and diphtheria patients, and the "separation pavilion," if necessary to the reception of infectious cases, concerning the definite diagnosis of which there is some doubt. The three new pavilions, which have been erected from plans by Mr. W. H. Ward, are of one story, similar in design and plan to those erected some few years ago, with the exception that in each of the new pavilions there are two small separation wards, with the nurses' duty-room so placed as to command a view of all the four wards. A leading feature of the new wards, which are 72 ft. long by 30 ft. wide, is the addition of a glazed wall fitting, forming a dado 5 ft. in height. The new home, which will accommodate fifty nurses, comprises bedrooms, large recreation-room, kitchen, etc., with an escape staircase from the upper rooms. The isolation pavilion includes four small wards.

BATHS, WAVERTREE.—The foundation-stone has just been laid of the new Picton-road building for the Baths Committee of the City Council of Liverpool. The plans of the establishment, which is estimated to cost 26,000*l.*, were prepared by Mr. W. R. Court, and Messrs. Waring and Sons, of West Derby, are the contractors. The site has a frontage to Picton-road of 70 ft., and to Clyan-street of 200 ft. Provision is made for two swimming baths, one 75 ft. by 35 ft., and the other 50 ft. by 27 ft., and fifty-five private baths. The buildings are set back 45 ft. from the line of the street, and space is reserved for additional private baths when required.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, ST. STEPHEN'S CHURCH, BELFAST.—A stained-glass window has been unveiled in this church in memory of the late Rev. Canon Irvine. The memorial has been designed and executed by Mr. W. E. Roberts, of Belfast.

APPOINTMENTS.

DURHAM UNIVERSITY COLLEGE OF SCIENCE.—Sir Isambard Owen has been elected, vice the late Dr. H. Palin Curney, to the Principalship of Durham University College of Science, Newcastle-on-Tyne, the governing body of which have just resolved that the name shall be in future the Armstrong College of Science in the University of Durham. Sir Isambard Owen is Vice-Dean of the Faculty of Medicine in the University of London, and has played a conspicuous part in the advancement of higher education in Wales.

ROYAL COLLEGE OF SCIENCE.—The Marquis of Londonderry, President of the Board of Education, has nominated Mr. W. Gowland, Professor of Metallurgy at the Royal College of Science, to succeed the late Sir Clement Le Neve Foster, F.R.S., as a member of the Examination Board of the Department of Technology of the City and Guilds of London Institute, Kensington.

BATTERSEA POLYTECHNIC.—The Governing Body of the Battersea Polytechnic have appointed Mr. H. A. Colding, A.M.Inst.C.E., to be assistant in mechanical engineering for the Drawing Office; and Mr. John Hurst (assistant-instructor in woodwork under the London County Council) to be assistant-instructor in carpentry and joinery and manual training in woodwork.

SANITARY AND ENGINEERING NEWS.

SEWERAGE SCHEME FOR BOUGHTON.—On the 14th inst., in the Council Chamber, Chester, Mr. M. K. North, M.Inst.C.E., an Inspector of the Local Government Board, held an inquiry into the Chester Corporation's application to the Local Government Board for sanction to borrow 4,000*l.* for works of sewerage at Boughton. The Town Clerk said the population of the city was 56,500, and the rateable value was 2,125,157*l.* 5*s.* 10*d.* The City Surveyor (Mr. I. Matthews Jones) explained the scheme in detail, together with particulars of his estimate of cost.

SEWERAGE OF SKEGNESS.—The Skegness Urban District Council have received sanction from the Local Government Board to borrow the sum of 10,500*l.* for improvements to the sewerage system, which includes a new sewer

along Dummond-road, construction of new pumping station, pumping main and ejector chamber, also septic tank and bacterial filters on the existing sewage farm. Messrs. Elliott and Brown, the engineers to the scheme, have been instructed to make the necessary arrangements for the work to be started as soon as possible.

PROPOSED SEWERAGE SCHEME, ASKERN, NEAR DONCASTER.—The Rural District Council of Doncaster have applied to the Local Government Board for sanction to borrow 3,843*l.* for purposes of sewerage and sewage disposal for the township of Askern, and Colonel A. G. Burnford, R.E., Inspector under the Local Government Board, recently held an inquiry into the matter. The scheme, which has been prepared by Messrs. D. Balfour and Son, of Newcastle-on-Tyne and London, provides for the main sewerage of the whole of the village, and collecting the sewerage at a pumping station, where it will be lifted by oil engines and pumps and discharged at a site of disposal works some 1,000 yds. distant, and then treated in septic tanks followed by filtration in continuous filters, the effluent being then distributed over 2 acres of land. The estimated cost of the works is 2,890*l.*, the land will cost 400*l.*, and the clerk of works, engineers, wayleaves, etc., 553*l.*, making a total of 3,843*l.*

NEW BRIDGE, SMALL HEATH, BIRMINGHAM.—The new bridge connecting Sparkbrook with Small Heath was opened on the 8th inst. The structure has been erected under the superintendence of Mr. John Price, the City Surveyor, and the cost has been 49,000*l.*

HARBOUR IMPROVEMENTS, PETERHEAD, N.B.—The negotiations which have been in progress for the purpose of securing funds for the carrying out of a scheme of harbour improvement at Peterhead have been completed. The scheme involves an expenditure of 54,000*l.*, and has been planned by Mr. William Shield, C.E., London.

FOREIGN.

FRANCE.—At the Petit Palais, Paris, there is now being organised a collection of sculptures and ceramic work by Carriès, presented to the City of Paris by M. Heintschel, and which will be opened in the course of November. —M. Guillaume has definitely resigned his position as Director of the Villa Medici. —The works are shortly to be commenced for a new bridge over the Seine, between the communes of Issy and Boulogne. —At Lyons a historical exhibition has been opened of the works of painters and sculptors who were natives of that city. —The Municipality of Quimper have commissioned M. Ramonatas, the architect, to make plans for an asylum for old men, at an estimated cost of 300,000 francs. —A hospital is to be erected at Béthune, at an estimated cost of 300,000 francs. —A committee has been formed at Rocroy for the erection of a monument to the memory of General Moroa.

—The Government has established a District School of Architecture at Rennes; and the new School of Architecture at Nantes has just been opened. —A competition has been opened for architects of the departments of Meurthe-et-Moselle, Meuse, Vosges, and Ardennes, for a large group of buildings to be erected at Nancy, to accommodate a Bourse de Commerce and various industrial societies of the district. —A large group of new schools has just been opened at Saint-Ouen l'Aumône, from the designs of M. Léon Mériot.

PUBLIC WORKS IN GENOA.—We learn that building in Genoa continues at a great pace, especially on the outside of the town, where houses (principally flats) are springing up in all directions. The new large station at Brignole is nearly completed, and the enlargements and improvements at Principe are progressing rapidly, as is also the marshalling station at Campasso. The question of connecting by a tunnel the eastern portion of the port with the new station at Brignole is still under consideration; though the difficulties of construction are great, it is believed they will be overcome. It is also believed that the proposed new tunnel through the Apennines will be a necessity when the new harbour works are undertaken, as the two existing tunnels through the Giovi are considered inadequate for the anticipated increase of traffic. The tunnels reached from Sampierdarena by opposite sides of the Polcavera valley join the main line again at Ronco, but, notwithstanding recent improved ventilation, the smoke that collects limits the number of trains that can be run through them, and unless electric traction be adopted from Sampierdarena to Ronco, or further improvement in ventilation is found possible, it is probable that the new tunnel will be made. The new harbour works just referred to are to be begun this autumn. The estimated cost

of them is about 2,400,000*l.*, and is to be raised by a loan. The works will include new docks and a general extension of the harbour and quays in the direction of Sampierdarena.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Civil and Mechanical Engineers' Society has changed its offices from 47, Victoria-street to 25, Victoria-street, Westminster. —Mr. A. S. E. Ackermann, consulting engineer, has removed his offices from 47 to 25, Victoria-street, Westminster.

THE BUILDING BY-LAWS, CARDIFF.—A deputation representative of the building trades of Cardiff waited upon the Cardiff Public Works Committee last week to protest against the strict enforcement of certain building by-laws which are at present in operation in the borough. Mr. George David, solicitor, who had been selected to head the deputation, said they represented not only the Master Builders' Association, but the whole of those who were engaged in the building trades in Cardiff, and it also included architects. The enforcement of certain by-laws had had the effect of putting a stop to the erection of small houses in the town, because the expense of building in accordance with the strict letter of the by-laws made it prohibitive. Two concessions which the deputation asked were that they should be allowed to erect the walls of domestic buildings in accordance with the graduated scale, and that they might be permitted to build all party walls of two or three story houses of 9-in. brickwork, instead of 1½ in., and that they should be allowed to insert plugs and plates in a party wall. They also asked to be allowed to measure the height of stories from floor to ceiling, instead of from floor to floor. The speaker did not think the Committee was absolutely bound to enforce the by-laws, because, acting on the advice of the Town Clerk the other day, one of the committees of the Corporation resolved to leave the enforcement of a by-law to the discretion of the Chief Constable. He thought the builders would be quite content if that Committee adopted the same course in regard to the building by-laws by allowing the Borough Surveyor (Mr. Harpur) to deal with such matters. Mr. E. W. M. Corbett said he had for a number of years dealt with similar by-laws as were in operation in the Borough of Cardiff in another district, and they had found that to enforce these by-laws in their entirety was absolutely impossible. The strict enforcement of the by-laws could not fail to drive people away to districts where the by-laws were not so strictly enforced. With regard to fires being communicated from one house to another through plugs and boards being inserted in party walls, he personally had never heard of a fire spreading from one house to another in that way. Mr. Hoare said several letters had been addressed to the Master Builders' Associations of Newport, Swansea, Bristol, Birmingham, and Liverpool on the questions mentioned that day, and in each case the builders were granted the concessions for which they were now asking. —Alderman Aldison: Supposing Mr. David, we thought fit to wink at certain clauses in our by-laws, and in regard to others we thought fit to go to court, what would be our position? Mr. David replied that it would not make any difference. They could wink at one clause and prosecute in another. The Chairman (Alderman J. Ramsdale) promised that all the points put before the Committee that afternoon should receive their fair and honest consideration. —*Western Mail.*

LINOLITE LAMPS.—We have received from the Linolite Company, of 47, Victoria-street, Westminster, a copy of a report they have received from Mr. Dow, of the Central Technical College, on twelve lamps which they submitted to him for a life test. One of the lamps failed after 650 hours, but all the rest successfully completed a 1,200-hour run. The lamps were for 100 volts, and the efficiency, assuming that "candle-power" is "mean horizontal candle-power," and that this forms a fair basis for comparison, are comparable with those obtained with the best glow lamps. The conclusions arrived at are that the decrease in the candle-power during the first 1,000 hours is about 15 per cent., and that the reflector does not exert a prejudicial effect on the life of the lamps.

HANOVER-SQUARE, W.—Under the directions and superintendence of Mr. T. H. Watson some improvements and alterations, comprising an additional story, are being carried out by Messrs. James Smith and Son, contractors, at the Oriental Club. The clubhouse was erected in 1827-8 after plans and designs made by Benjamin Dean Wyatt in conjunction with his younger brother Philip;

in 1871 a wing was added by Henry Burton, nephew and successor of the late Burton. On October 9, 1897, we adverted to a structural change that had then been made at No. 17, at the corner of Teatree and the square, which consisted in altering the appearance and character of the house, which, known as "Sweet Serp" was formerly the home of the Art Union. We now observe that No. 17 has been demolished, and that two or three of the houses on the north side of Pentecote opposite the Oriental Club, have lately rebuilt.

THE LAW AS TO COMBINED DRAINAGE.—The Public Health Committee of the Borough Council reported on Monday that it had decided to ask the London County Council to endeavour to get the law as to combined drainage altered as follows:—The construction of the Metropolitan Management Act, 1855, and the Acts amended the same, the word "drain" shall be deemed to apply to and include the subject specified in the interpretation of the word "drain" contained in the 250th section of the Metropolitan Management Act, 1855, the 121b section of the Metropolitan Management Act, 1862, and also any drainage construction of which a sewer has not been approved as a sewer by the Metropolitan or other Commissioned Sewers, or by the Metropolitan Board of Works, or the London County Council, at any time hereafter approve as a sewer drain for draining a group or block of houses, in the opinion of the local authority of the district, it is desirable that such drains should be cleaned, repaired, and maintained at the expense of such local authority, and such drains shall thereupon become drains and be vested in such local authority. Any local authority may recover any expenses incurred by them after the passing of this Act in cleansing, repairing, or replacing a drain for draining any group or block of houses from the owner or owners of the premises for the drainage of which such premises, or any part of such premises, there be more than one such owner, shall be determined by the surveyor of the authority, or in case of dispute by the County Council. Any such expenses recovered from the present or any former owner of the premises, either by action in High Court or before a Court of Sessions.

ST. THOMAS'S HOSPITAL.—The Treasurer reports of the progress of this hospital that during the year No. 6 block has been taken in hand, both the wards have been arranged, the sanitary details of the premises have been completely overhauled and the warming of the wards has been proved. Much consideration has been given to the question of what is really the most useful hospital flooring. In two wards a trial has been given to linoleum covering, whilst in the third ward, which is now in hand, a trial is being made of parquet laid on the existing boards, it is felt most desirable to preserve as far as possible the old oak floors or to lay them when the hospital was built, which have become too rough and uneven the surface.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—According to returns supplied by eight Employers' Associations, whose members are estimated to employ about 90,000 operatives of all classes, and by trade unions with an aggregate membership of 1,185,000, employment in the building trade continued dull during September, and was a whole was rather worse than in August, and was also worse than a year ago. With layers employment was dull, and about the same as a month ago and a year ago. Masons' employment was moderate in England, but in Scotland. Employment with carpenters and joiners was bad generally, and worse than a month ago and a year ago. The percentage of unemployed trade union carpenters and joiners was 7.0 at the end of September, compared with 5.9 at the end of August, and 6.0 at the end of September, 1903. With plasterers employment was bad, and rather worse than a month ago and a year ago. With plumbers employment was dull, and about the same as a month ago, and a year ago. The percentage of unemployed trade union plumbers was 9.5 at the end of September, compared with 8.9 at the end of August, and 6.4 a year ago. Slaters and tilers employment was dull, about the same as a month ago, and a year ago, rather worse than a year ago. —*Lancet.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

9 of 1903.—F. BLACKBURN, A. DELL, J. P. MOH, and R. H. BELL: *Mechanism for Raising and Lowering Window Sashes, and the like.*

Means for automatically raising the sashes by way of carriages, and the like, with a rolled movement, consisting in the engagement of a spring barrel and a train of desired number of wheels with a flyer flyer catch, a ratchet wheel, and pawl antageously placed to release the train or of the train of wheels from action in one tion.

1 of 1904.—J. BURNS: *Mechanical Sliding oor for Shop Windows.*

relates to a mechanical arrangement that enable a salesman at all times to gain ase to window area, without the disarrange- of the goods displayed therein. The of window space is sunk 4 in. below the e height, and, extending back into shop beyond window space, on this level floor placed a duplicate sliding floor, fitted beneath with four sets of 1-in. metal rs running on bands of 1-in. ribbon iron wed into bottom floor and rubber coated ure silent movement. On this movable is placed a set of four wire stands 8 in. e, stepped and rising from front to back proportion to depth of window area. These ort strips of plate glass, on which the s are displayed. To gain access to the s in the window, a wheel attached to, hinging at the back, is revolved by hand, acts upon a screw mechanism hoisting, and floor, with stands, shelves, and goods, is ntly rolled back, leaving a clear space e from front trimmer to window.

5 of 1904.—CONDUITS AND FITTINGS, LTD., M. EDWARDS, and E. A. BROWN: *Bends, ows, and other Angle Pieces for Electric nduits.*

vided bend, elbow, or other connecting or conduits, the sockets of which are ed with bridge pieces between which the mediate portion of the fitting is jointed. ds of the said intermediate portion h form parts of the sockets being screw- ed to joint upon the pipes or tubes ed into the sockets.

2 of 1904.—G. C. BROWN, JUN.: *Window nd Furniture.*

otch" window blind furniture, having rackets and pawl so constructed and igned that the brackets may be fitted in the vertical or horizontal position, when in the vertical position the blind e made to run either next to the glass or y from it, whilst when in the horizontal ion the blind can be made to run next to glass.

7 of 1904.—H. J. SALTER: *Pipe Joints.*

ipe-jointing device, consisting of a nut eg within it a thimble, the flange of which against a shoulder in the nut, the said having also screwed into it a socket, the ble and socket being destined to receive opposing ends of the pipes to be joined, ds of which pipes are flanged over the ing ends of the thimble and socket.

3 of 1904.—M. HERSCHMANN and C. ALCHNER: *Windows.*

ows, consisting in the combination of r two casements adapted to be opened rly or outwardly, being provided on the e with hinges, and on the outside with es, which hinges are of such construction when the pins of the inner hinges are ed in their sockets those of the outer s are disengaged, and *vice-versa*, when pins of the outer hinges are engaged in sockets those of the inner hinges are engaged; a rail adapted to lock said nents, and a top sash adapted to be ed directly by the casements in their d position, and slidable in the window e when the casements are open.

8 of 1904.—C. H. RANG, JUN.: *An Appa- ratus for Use in Constructing Concrete or ular Partition Walls.*

pparatus for use in constructing concrete ular partition walls, comprising two ds, uprights for guiding the boards ed to the floor or to the ceiling joints, ed together by means of cramps or the and screw-bolts which run through the ds for the purpose of facilitating the ng up of the device, and preventing any ng of the boards when the plaster sets.

9 of 1904.—R. KLINGER: *Ball Joints for rtical Piping.*

oints for vertical piping, which consists rring an annular duct, for the recep-

l these applications are in the stage in which ion to the grant of Patents upon them can e.

tion of viscid lubricant, in the ball casing n the same level as the end of the joint head for the purpose of enabling the lubricant to be introduced into the ball casing from the top, and thereby ensuring the lubrication; and tight jointing of the ball head at all places on its spherical surface.

18,171 of 1904.—T. POTTERTON: *Hot-water Apparatus, and Boilers Connected therewith.*

This relates to an arrangement of hot-water apparatus in which the boiler is connected a series of vessels constituting the hot-water tank by pipes having stop-cocks, so that the circulation can be caused to heat the water in one, two, or more vessels.

22,429 of 1903.—A. M. LAMBERT: *Manufacture of Building Slabs or Bricks.*

A mould for forming building slabs or blocks, consisting of a base, side frames hinged to the base, and adapted to open outwardly, and end pieces locked to the sides when the mould is closed, tight joints being formed between the sides and base, and a separate closing top.

23,778 of 1903.—W. G. MOORE: *Disinfection of Urinals, Water-closets, Baths, Lavatory Basins, Kitchen Troughs or Sinks, and like Vessels and Places.*

A mode of, and means for, disinfecting urinals, closets, baths, lavatory basins, kitchen troughs or sinks, and the like, and which may be fixed in vehicles, ships, buildings, hospitals, railway carriages, sea-going vessels, and the like, characterised by a vessel for containing disinfectant material and having perforated sides, in combination with means for suspend- or supporting or fixing same in the required position.

24,741 of 1903.—R. A. HADEFIELD and P. B. BROWN: *Temporary Tracks for Railway and Tramway Permanent Way.*

A tramway or light railway ramp made so as to prevent its thin end from being turned up by the action of wheels rolling over it, with a thicker portion extending longitudinally from the thin end of the ramp and arranged at one side of the ramp so as to be clear of vehicles running therealong.

24,869 of 1903.—J. SHANKS: *Pipe Joints.*

Pipe joints, consisting of a fitting formed with a sleeve of rubber, or other compressible material, having ribs, corrugations, serrations, or projections on its outer or inner surfaces, or on both surfaces, and with or without a flange at one end.

25,437 of 1903.—E. HOMAN: *Partitions Employed in Fireproof or other Buildings.*

A partition, consisting of a series of bricks or blocks, grooves in the meeting edges of the bricks or blocks, short tie bars or rods within the channels formed by the grooved meeting edges of the bricks or blocks, and so arranged that their ends break joint with the courses of the bricks or blocks and with one another, and a filling or grouting of suitable cement.

5,440 of 1904.—A. SALTER, JUN.: *Apparatus for Joining and Repairing Drain Pipes.*

An apparatus for joining and repairing drain pipes, consisting in the combination of two rubber discs, plates arranged on each side of said discs, holes in said discs and plates, chains, or other flexible connexions passed through the said holes, each chain being fixed to one disc and passing loosely through the holes in the other disc, and a spring arranged between said discs having a normal tendency to draw the discs together.

10,227 of 1904.—A. T. MIRZA: *Automatic Sluice Gate.*

The invention consists of a sluice gate swinging in a suitable sluice way upon horizontal gudgeons. The axis of the gudgeons is somewhat below the centre of the surface of the gate, so that up to a certain height the pressure of the water tends to close the gate and to keep it closed. As the water rises above a certain point the superior pressure on the upper part of the gate will cause the latter to turn on its axis, opening the sluice, and allowing the water free flow both above and below the gate.

15,554 of 1904.—S. F. K. ALBERTSEN, J. M. MADSEN, and J. C. MADSEN: *Ball Valves for Water-closet and other Cisterns.*

Ball valves for water-closet and other cisterns, consisting of a cylinder or hollow plug formed with openings through which the supply water passes to and through a perforated cover or plate at the top of the same, and thence down a central tube to the bore or outlet forming the seat of the ball-lever valve or plug.

16,383 of 1904.—J. THOMSON: *Machines for Laying Bricks in Building Walls.*

A brick-laying machine supported upon the wall by means of trucks near each end of the

machine, one of the trucks being adapted to rest upon the course of bricks which are in process of being laid, and the other truck being adapted to rest upon the prior laid course of bricks, and the trucks being vertically adjustable so that the machine may be made level no matter which end of the machine is in advance of the other.

17,485 of 1904.—T. QUADRI: *Facing and Paving Tiles, Blocks, and Slabs.*

A method of manufacturing facing and paving tiles, blocks, and slabs, consisting in mixing sawdust with magnesia, of binding the same with sodium chloride solution, or the like, shaping the sterilised wood pulp so formed into tiles, blocks, or slabs, and impregnating the said tiles, blocks, or slabs with tar.

17,968 of 1904.—S. F. PREST: *Manufacture of Various Articles, such as Bricks, Paving Flags, and Artificial Stone.*

The manufacture of various articles, such as bricks, paving flags, artificial stone from slag removed from Bessemer converters or Siemens' furnaces, consisting in grinding or crushing the said slag, separating the magnetic or metallic from the non-magnetic or non-metallic portion, adding slaked lime to the latter, then forming or shaping the same by pressure, and finally hardening the articles by subjecting them, in a closed chamber, to the action of steam at a suitable pressure.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, manuscripts, or other documents, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.	
October 3.—By PEIRCE & THORPE (at Hincley).	
Barwell, etc., Leicester.—Freehold farmhouse and 115 acres	£3,750
October 6.—By W. LUDLOW & BRISCOE (at Birmingham).	
Studley, etc., Warwick.—"Greenhill Farm," 105 a. 0 r. 13 p., f., y. r. 75s.	1,550
October 8.—By SELWANS (at Norwich).	
Norwich.—70, Upper St. Olives-st., six cottages and tenements adjoining, f., p.	2,000
Eaton, two freehold building sites	780
Alburgh, etc., Norfolk.—"Burlingham Lodge" and "Burr Oak" farms, 204 a. 2 r. 3 p., f., y. r. 12s.	1,600
By J. CARTER, JONES, & SONS (at Cambridge).	
Foxton, Cambs.—Freehold allotment land, 79 a. 0 r. 17 p., f.	4,000
"Hopper Fields," 101 a. 2 r. 29 p., f.	2,750
Barwell, Cambs.—Copyhold arable land, 6 acres	100
By T. W. OAZE & SON (at Norwich).	
Causton Road, Norfolk.—"The Old Hall Farm," 151 a. 0 r. 16 p., f., y. r. 130s.	1,720
October 10.—By SCOBELL & LAKE.	
Oxford-street.—17, Castle-st. East (s.), u.t. 26 yrs., g. r. 15s., y. r. 100s.	980
18, Castle-st. East (s.), and 7a, Marylebone-passage, u.t. 26 yrs., g. r. 15s., y. r. 130s.	1,225
Clapton.—17, 149, and 151, Eldonfield-rd., u.t. 74 yrs., g. r. 15s., w. r. 117s., g. r. 9, 11, and 13, Sewley-st., u.t. 71 yrs., g. r. 12s., w. r. 117s.	850
1, 3, and 5, Chippenale-st., u.t. 71 yrs., g. r. 12s., w. r. 117s. 16s.	765
October 11.—By DAVID BURNETT & Co.	
Wood Green.—High-rd., l.g. rents 18s., u.t. 81 yrs., g. r. 5s.	240
Waldgrave-rd., l.g. rents 18s., u.t. 81 yrs., g. r. 6s.	215
Coleraine-rd., l.g. rents 18s., u.t. 81 yrs., g. r. 6s.	210
Finchley.—Squire's-la., freehold building land, 24 acres	3,500
Bow-la., a freehold building plot	400
Squire's-la., etc., freehold building land, 34 acres	2,750
Great North-rd., a corner building site, f.	2,020
By DEBENHAM, TEWSON, & Co.	
Norwood.—1, Chapel-rd., u.t. 34 yrs., g. r. 3s., y. r. 36s.	340
82, Chapel-rd. (s.), f., y. r. 52s.	600
Epsom, Surrey.—36, Station-rd., f., y. r. 38s.	650

By RUTLEY, SON, & VINE.

St. Pancras—43 to 55 (odd), Euston-buildings (flats), f., e. r. 1183.	10,000
Holloway—59, Tufnell-pk.-rd., u. t. 69; yrs., g. r. 84, p. 1	440
Camden Town—16 and 12, Camden-st., u. t. 36 yrs., g. r. 122, v. r. 100L	1,010
Hampstead-road—5, Rutland-st., u. t. 19; yrs., g. r. 20L, p. 1	240

By WALTON & LEE (at Newcastle).

Thornbrough, Northumberland.—The Thornbrough Estate, 910 a. 1 r. 19 p. f. (in one lot)	33,000
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By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).

Aldgate.—High-st., Aldgate Distillery (otherwise "Coach and Horse" p. h.), u. t. 39; yrs., v. r. 85L, with goodwill	4,500
Sydenham.—Newlands-pk., freehold building site	380

By G. E. LUCK.

Hornsey.—76 and 78, Westd.-rd., f., v. r. 59L 16s.	555
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By O. HEAD & CO.

City-road.—Nos. 165 to 191 (odd) (s.), area 29,000 ft. f., v. r. 89L	17,000
Hoxton.—27, 28, and 29, Barnum-st., also schoolroom adjoining, area 2,760 ft. f., v. r. 96L	1,210
Britannia-st., "The Crown and Sceptre" p. h., f., v. r. 90L	2,600
31 to 35, Britannia-st. (s.), and 39 and 37, Nile-st., area 4,630 ft. f., v. r. 238L	3,125
36 to 45, Britannia-st., area 8,720 ft. f., v. r. 294L	3,395
89 to 94, Britannia-st. (s.), and 95 and 37, Nile-st., area 5,580 ft. f., v. r. 279L	3,300
Britannia-st., "The Crown and Anchor" p. h., f., v. r. 45L	900
97 to 100, Britannia-st. (s.), and 38 and 42, Nile-st., area 5,740 ft. f., g. r. 267L	3,300
Peckham.—104 and 106, Rye-la. (s.), f., v. r. 145L	3,100
Leyton.—217, Beaumont-rd. ("Beaumont Laundry"), beneficial lease for 16 yrs., v. r. 165L (with goodwill, plant, machinery, etc.)	710
Alresford, Hants.—The Weir Laundry, beneficial lease for 18 yrs., v. r. 100L (with goodwill, plant, machinery, etc.)	150

By WRIGHT & SCRUBY (at Cambridge).

Cambridge.—Trumpington, "St. Mary's," and O. a. 1 r. 6 p. f., e. r. 60L	865
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October 13.—By H. J. BLISS & SONS.

Mill End.—42 and 44, Sceptre-w. r. 57L 4s.; also i. g. rents 16L, u. t. 25; yrs., g. r. 22L	300
Bethnal Green.—21 to 33 (odd), Warley-st., f., w. r. 218L 8s.	2,115

By CHESTERTON & SONS.

South Kensington.—3 and 4, Spear-mews, u. t. 69; yrs., g. r. 7L, v. r. 74L	830
3, Farnell-mews, u. t. 68; yrs., g. r. 8L, v. r. 55L	510
Fulham.—17, 18, and 23, Anselm-rd., u. t. 68; yrs., g. r. 12L, w. r. 126L 8s.	870
Shepherd's Bush.—17 and 19, Bloemendin av., u. t. 75; yrs., g. r. 10L, v. r. 73L 12s.	725
Southeast, Essex.—The Grove, freehold corner building site	100
Notting Hill.—108 and 110, Holland Park-rd., u. t. 18 yrs., g. r. 10L, v. r. 200L	1,740

By E. COLE & SON.

Bethnal Green.—346 and 348, Old Ford-rd., u. t. 49; yrs., g. r. 8L, w. r. 82L 8s.	760
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By C. C. & T. MOORE.

Forest Gate.—15 and 17, Belton-rd. (factory, etc.), u. t. 83 yrs., g. r. 12L, e. r. 120L	320
Upton Park.—Neville-rd., "Neville-rd. Works," area 13,000 ft. f., e. r. 20L	1,150
Leytonstone.—518 and 522, High-rd., u. t. 67 yrs., g. r. 12L, v. r. 60L	680
55, Ranelagh-rd., u. t. 87 yrs., g. r. 4L, w. r. 26L	200

By NEWBON, EDWARDS, & SHEPHERD.

Hornsey.—Wightman-rd., f. g. rents 13L, reversion in 83 yrs.	330
Kentish Town.—143, Prince of Wales-rd., e. r. 45L	745
117, Prince of Wales-rd., u. t. 40 yrs., g. r. 5L 10s., v. r. 40L	410
138, 140, and 150, Prince of Wales-rd., u. t. 40 yrs., g. r. 15L 10s., v. r. 120L	1,250
Haverstock Hill.—14, Rochford-st. (s.), u. t. 60 yrs., g. r. 7L, e. r. 40L	280
Camden Town.—264, Camden-rd., u. t. 84; yrs., g. r. 6L, e. r. 80L	525
Hornsey Rise.—35, Hanley-rd., f., v. r. 40L	575

By DANIEL WATNEY & SONS.

Stepney.—Hardings-st., etc., area 23,240 ft., also four railway arches, building lease for 50 yrs., let at 10s.	190
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By SIMMONS & SONS.

Shepherd's Bush.—6 to 12 (even), Southbrook-st., u. t. 47; yrs., g. r. 17L 12s., w. r. 148L 4s.	620
32, 36, 37, and 47, Southwark-st., u. t. 59; yrs., g. r. 12L, w. r. 196L 6s.	705
64, Stow-rd., u. t. 62; yrs., g. r. 6L 10s., w. r. 39L	215
12 and 14, Wilton-rd., u. t. 55 yrs., g. r. 12L, w. r. 72L 10s.	435
Bromley-by-Bow.—109, Devons-rd. (s.), f., v. r. 40L	490
206, 208, and 212, Devons-rd. (s.), u. t. 58 yrs., g. r. 12L, v. r. 135L	815
304, 310, 312, and 314, Devons-rd. (s.), u. t. 96; yrs., g. r. 24L, v. r. 173L 12s.	940
16, 17, 17A, and 18, Weston-st., f., w. r. 104L	920
Peckham.—24, Nelson-sq., u. t. 25; yrs., g. r. 6L 6s., w. r. 33L 16s., w. r. 442L 10s.	165
Old Kent-road.—12 to 16, Osborne's-buildings, f., w. r. 109L 4s.	710
New Cross.—4, Reaston-st. (with workshop), u. t. 71 yrs., g. r. 10s., p.	500
Streatham.—1 and 3, Tankerville-rd., u. t. 75 yrs., g. r. 18L, e. r. 100L	725
Walworth.—2, 4, 6, 8, 24, 26, and 35, Tidall-pk., u. t. 71 yrs., g. r. 16L, w. r. 442L 10s.	180
Elmham, Kent.—12, Court-yd. (the post office), u. t. 40 yrs., g. r. 4L 7s. 6d., v. r. 62L	625

By J. A. & W. THARP.

Dalston.—53, Strubland-gr., u. t. 41; yrs., g. r. 5L, e. r. 35L	4320
Muswell Hill.—Sidney-rd., a freehold building plot	125

By EDWIN EVANS (at Battersea).

Fulham.—44, Kinnoul-rd., f., w. r. 39L, u. t. 60 yrs., g. r. 13L 5s., e. r. 75L	383
Clapham Common.—114, North Side, u. t. 80 yrs., g. r. 13L 5s., e. r. 75L	775
Wandsworth.—15 and 17, East Hill (s.), f., v. r. 100L	1,215
Battersea.—10, Falcon-rd., u. t. 73 yrs., g. r. 5L 5s., v. r. 30L	320
14 and 16, St. John's Hill-gf., f., w. r. 78L	790
9, Malhuson-rd., u. t. 63 yrs., g. r. 5L, v. r. 32L	280
Church-rd. (rear of), f. g. r. 8L, reversion in 73; yrs.	190
Streatham.—6, Penrith-st., u. t. 93 yrs., g. r. 6L 15s., p.	320
4, Blegborough-rd., f., v. r. 48L, u. t. 93 yrs., g. r. 10L, v. r. 48L	655
Tooting.—1 to 10, Courtney-rd. (flats), u. t. 99 yrs., g. r. 27L 10s., w. r. 174L 4s.	515
Norbury.—17, Melfort-rd., and four houses adjoining, u. t. 97; yrs., g. r. 32L, p.	800
30, Melfort-rd., u. t. 98 yrs., g. r. 8L, v. r. 45L	1,445
October 14.—By ROGERS BROS.	450
Peckham.—29 to 35 (odd), Canton-gr., u. t. 50; yrs., g. r. 23L, w. r. 148L 4s.	1,135

Contractions used in these lists.—F. g. r. for freehold ground-rent; l. g. r. for leasehold ground-rent; i. g. r. for improved ground-rent; g. r. for ground-rent; r. for rent; f. for freehold; e. for copyhold; l. for leasehold; p. for possession; e. r. for estimated rental; w. r. for weekly rental; q. r. for quarterly rental; v. r. for yearly rental; u. t. for unexpired term; p. a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; crea. for crescent; av. for avenue; gl. for garden; yd. for yard; gr. for grove; h. b. for hearthouse; p. h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, OCTOBER 21.

Institution of Mechanical Engineers.—8 p.m.

TUESDAY, OCTOBER 25.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr. R. Horton on "Details of Plumber's Work: House Drainage, and Sanitary Appliances," 7 p.m.

THURSDAY, OCTOBER 27.

Architectural Association.—Conversation, 15, Tufton-street, Westminster. 8 p.m.

Carpenters' Company, London Wall (Lectures on Sanitary Building Construction).—Professor F. M. Simpson on "Building Materials and Modes of Using Them—the Decay and Preservation of Timber." 7.30 p.m.

SATURDAY, OCTOBER 29.

Junior Institution of Engineers—Visit at 3 p.m. to the National Physical Laboratory, Bushy House, Teddington.

Sanitary Institute (Provincial Sessional Meeting at Southampton).—Discussion, to be opened by Dr. R. E. Lander, on "Infectious Fever Hospitals." 11 a.m.

By J. A. & W. THARP.

Thames and Pit Sand.....	7 3 per yard, deliv.
Thames Ballast.....	6 0 " " "
Best Portland Cement.....	30 0 per ton,
Best Ground Blue Lias Lime 20 0 " " "	

NOTE.—The cement or lime is exclusive of the cost of charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, deliv.

Stourbridge Fireclay in sacks 27s. 6d. per ton at rd.

STONE.

BATH STONE—delivered on road wagons. s. d.

gone, Paddington Depot.....	1 6 3 per ft. f.
Do. do. delivered on road wagons,	
Nine Elms Depot.....	1 8 4 " "

PORTLAND STONE (20 ft. average)—

Brown Whitbed, delivered on road	
wagons, Paddington depot, Nine	2 1
Elms depot, or Pimlico Wharf.....	
White Basebed, delivered on road	
wagons, Paddington depot, Nine	
Elms depot, or Pimlico Wharf.....	2 2 3

Manchester in blocks..... 1 11 per ft. cube, deliv. rly.

Beer..... 1 6 " " "

Greenhill..... 1 10 " " "

Darley Dale in blocks..... 2 4 " " "

13 Corsehill..... 2 5 " " "

Closeburn Red Freestone 2 0 " " "

Bed Mansfield..... 2 4 " " "

YORK STONE—Robin Hood Quality.

Scrapped random blocks 2 10 " " "

6 in. sawn two sides

landings to sizes

(under 40 ft. super.) 2 3 per ft. super.

6 in. rubbed two sides

ditto, ditto..... 2 6 " " "

3 in. sawn two sides

slabs (random sizes) 0 11 1/2 " " "

2 in. to 2 1/2 in. sawn one

side slabs (random

sizes)..... 0 7 3/4 " " "

1 1/2 in. to 2 in. ditto, ditto 0 6 " " "

HARD YORK—

Scrapped random blocks 3 0 per ft. cube,

6 in. sawn two sides,

landings to sizes

(under 40 ft. super.) 2 8 per ft. super.

6 in. rubbed two sides

ditto..... 3 0 " " "

3 in. sawn two sides

(slabs random sizes) 1 2 " " "

3 in. self-faced random

flags..... 0 5 " " "

Hopton Wood (Hard Bed) in blocks 2 3 per ft. cube,

deliv. rly.

6 in. sawn both

side landings 2 7 per ft. super,

deliv. rly.

3 in. do. 1 2 1/2 " " "

SLATES.

in. in. £ s. d.

20 x 10 best blue Bangor	13 2 6 per 1000 of 1200 a
20 x 12 " " "	13 17 6 " "
20 x 10 first quality " "	13 0 " "
20 x 12 " " "	13 15 0 " "
16 x 8 " " "	7 5 0 " "
20 x 10 best blue Port-	
madoc.....	12 12 6 " "
20 x 10 best " " "	6 12 6 " "
16 x 8 " " "	15 17 6 " "
20 x 12 " " "	18 7 6 " "
16 x 8 " " "	10 5 0 " "
20 x 10 permanent green 11	12 6 " "
18 x 10 " " "	9 12 6 " "
16 x 8 " " "	6 12 6 " "

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the true prices of materials, and not necessarily the list price which should be remembered by those who make use of this information.

BBICKS, & Co.

£ s. d.

Hard Stocks.....	1 14 0 per 1000 alongside, in river.
Rough Stocks and	
Orizzles.....	1 13 0 " " "
Facing Stocks.....	2 12 0 " " "
Shippers.....	2 10 0 " " "
Fleets.....	8 0 " " " railway depôt.
Red Wire Cuts.....	1 14 0 " " "
Best Fareham Bed	3 12 0 " " "
Best Bed Pressed	
Hendon Facing.....	5 0 0 " " "
Best Blue Pressed	
Staffordshire.....	4 4 0 " " "
Do. Ballnose.....	4 10 0 " " "
Best Stourbridge	
Fire Bricks.....	4 8 0 " " "

GLAZED BRICKS.

Best White and	
Ivory Glazed	
Stretchers.....	13 0 0 " " "
Headers.....	12 0 0 " " "
Quoins, Bullnose,	
and Flats.....	17 0 0 " " "
Double Stretchers	19 0 0 " " "
Double Headers.....	16 0 0 " " "
One Side and two	
Ends.....	19 0 0 " " "
Two Sides and	
one End.....	20 0 0 " " "
Splays, Cham-	
ferred, Squints 20 0 0 " " "	
Best Dipped Salt	
Glazed Stretch-	
ers, and Header 12 0 0 " " "	
Quoins, Bullnose,	
and Flats.....	14 0 0 " " "
Double Stretchers	15 0 0 " " "
Double Headers.....	14 0 0 " " "
One Side and two	
Ends.....	15 0 0 " " "
Two Sides and	
one End.....	15 0 0 " " "
Splays, Cham-	
ferred, Squints 14 0 0 " " "	
Second Quality	
White	
Dipped Salt	
Glazed.....	2 0 0 " " less than best.

TILES.

Best plain red roofing tiles. 42 0 per 1000 at rly. d.

Hip and Valley tiles..... 3 7 per doz.

Best Glossy tiles..... 50 0 per 1000

Do. Ornamental tiles..... 52 6 " "

Hip and Valley tiles..... 4 0 per doz.

Best Buxton red, brown, or

brindled do. (Edwards) 57 6 per 1000

Do. Ornamental do..... 60 0 " "

Hip tiles..... 4 0 per doz.

Valley tiles..... 3 0 " "

Best Red or Mottled Stafford

shiro do. (Peakes)..... 51 9 per 1000

Do. Ornamental do..... 54 6 " "

Hip tiles..... 4 1 per doz.

Valley tiles..... 3 8 " "

Best "Hosensary" brand

plain tiles..... 48 0 per 1000

Best Ornamental tiles..... 50 0 " "

Hip tiles..... 4 0 per doz.

Valley tiles..... 3 8 " "

Best "Hartsbill" brand

plain tiles, sand faced, 50 0 per 1000

Do. pressed..... 47 6 " "

Do. Ornamental do..... 50 0 " "

Hip tiles..... 4 0 per doz.

Valley tiles..... 3 6 " "

WOOD. At per stand.

Deals: best 3 in. by 11 in. and 4 in. £ s. d.	
by 9 in. and 11 in.....	15 10 0 15
Deals: best 3 in. by 7 in. and	
Battens: best 2 1/2 in. by 7 in. and	14 10 0 16
8 in., and 3 in. by 7 in. and 8 in., 11 0 0 12	
Battens: best 2 1/2 by 6 and 3 by 6.....	10 10 0 less
Deals: seconds.....	1 0 0 7 in. and
Battens: seconds.....	1 0 0 0 less 1/2
2 in. by 4 in. and 2 in. by 5 in.....	9 0 0 8
2 in. by 4 1/2 in. and 2 in. by 5 in.....	8 10 0 8

Foreign Sawed Boards—

1 in. and 1 1/2 in. by 7 in.....	0 10 0 more
2 in.	1 0 0 batt

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Design by Dow
*Conversion of School Into a Home	Lambeth Guardians	Not stated	Dec.
*School	Croydon Education Committee	Not stated	No d.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Time to be Done
Cable Wall, Gaythorn Gasworks	Manchester Corporation	C. Nickson, Superintendent, Gas Depart., Town Hall, Manchester	Oct.
Furniture & Ironmongery, Children's Hm., Mount-st.	Derby Guardians	N. Twizge, Poor Law Offices, Derby	Oct. d.
Exten. of Chancel, Holy Trinity Ch., Stockton-on-Tees	Radcliffe U.D.C.	C. S. Errington, A.R.I.B.A. Viet.-bldgs., Graining-st. W., Nwe.-T.	d.
Water-street Improvement	Manchester, etc., Paving Committee	Engineer, Council Offices, Radcliffe	d.
Rebuild, Taber, Welsh Wesleyan Chapel, Rhyney	do.	29, Butlin-gardens, Cardiff	d.
Glazed Earthenware Sewer Pipes	do.	Chief Clerk, Highways Department, Town Hall, Manchester	d.
Pitch and Creosote Oil	do.	do.	d.
Portland Cement	do.	do.	d.
Reconstruct, 4 Houses, etc., 55 Cliff, Darlington	Mr. O. Chapman, J.P.	J. C. Worth, Helzington-road, 55 Cliff	d.
Machine Tools required at Car-shed	Rochdale Corporation	General Manager, Car-shed, Mellor-street, Rochdale	Oct. d.
Stores, Tramway Committee	Manchester Corporation	J. M. M'Elroy, Tramways Manager, 55, Piccadilly, Manchester	d.
Street Works	Wiltington U.D.C.	A. H. Mountain, Surveyor, Town Hall, West Didsbury	d.
Two Houses, Macclesfield	Manchester, etc., Paving Committee	F. G. Webb, Architect, Holly Bush, Lower Machen	d.
Sewering, etc., Squire-street, Cheetham	do.	Paving Department, Surveyor's Office, Town Hall, Manchester	d.
Draining, etc., Passages, Ardwick	do.	do.	d.
Draining, etc., Passages, Albany-street, etc.	Mr. C. Sutcliffe	B. F. Simpson, F.R.I.B.A., 12, Grey-street, Newcastle-on-Tyne	d.
Additions, etc., to Hopkin-grove, Miffield	Accrington Dis. Gas and Water Bd.	C. Harrison, St. James's-street, Accrington	d.
Two Coke Trucks	Maldenhead Town Council	W. Young, Architect, Park-road, West Hartlepool	d.
Warehouse, Villiers-street, West Hartlepool	Horsham R.D.C.	E. & C. Brooks, Architects, 6, Huddersfield-road, Brighouse	d.
*Four Through Houses at Bradley, near Huddersfield	Sec. of State for India in Council	W. Densgate, 58, Park-street, Horsham	d.
Mortuary, Bravely-road	Maesvraig Building Club	Director-General of Stores, India Office, Whitehall, S.W.	Oct. d.
Brass Boiler Tubes	Middleton Corporation	W. Harris, Architect, Olifach, Barroed	d.
Twelve Houses at Gilfach, Bargoed	Aldershot U.D.C.	T. Holt, Town Clerk, Winchester	d.
Dust Destructor, etc.	Wallasey U.D.C.	T. A. Butterly & S. B. Birds, Architects, 1, Basinghall-st., Leeds	d.
Alterations, &c., Redshaw House, Armlay	do.	F. C. Uren, Surveyor, Aldershot	d.
Oranite	do.	J. Vickers Edwards, County Architect, County Hall, Wakefield	d.
Conversion of Closets, etc., Crofton School	do.	District Engineer and Surveyor, Public Offices, Egremont	d.
Making-up Streets and Passages, Seacombe	do.	do.	d.
Making-up Streets and Passages, Egremont	do.	do.	d.
Propagating House and Cold Frames, Liscard	Rochdale General Purposes Com'ttee	S. S. Platt, Borough Surveyor, Town Hall, Rochdale	d.
Altering Premises, 74, Market-place, Whitehaven	Cleator Moor Co-operative Society	55, Church-street, Whitlaver	d.
440 yds. of Cable	Rugby U.D.C.	T. M. Wratistaw, Clerk, Rugby	d.
Culvert over Stoll, near Carr House, Seaton-road	West Hartlepool Corporation	N. F. Dennis, Borough Engineer, West Hartlepool	d.
Granite Spalls, Mitham	Holborn Guardians	J. A. Battersby, Clerk, Holborn Union Offices, Clerkenwell-road, E.C.	d.
Gangway over Rich Line of Rly. at Destructor Works	Glasgow Corporation	Office of Cleansing Department, 38, Cochrane-street, Glasgow	d.
120 Lamps	Dalkey U.D.C.	J. P. Oahan, Clerk, Town Hall, Dalkey	Oct. d.
Private Street Works	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	d.
Works to Frontages of Labourers' Cottages	South Dublin R.D.C.	T. J. Byrne, A.R.I.B.A., 1, James-street, Dublin	d.
Forty-two 14-in. Cast-Iron Socket Pipes	West Hartlepool Corporation	N. N. Dennis, Borough Engineer, West Hartlepool	d.
Iron Building for Brick Plant	Selby U.D.C.	Surveyor's Office, Town Hall, Selby	d.
Flooring Swimming Baths, Selby	Wandswoth Guardians	F. W. Piper, Union Offices, St. John's Hill, Wandswoth	d.
300 Tons of Guernsey Granite Spalls	Bucklow Guardians	E. T. M'Beath, Architect, Birnam House, Sole	d.
Stone-breakers' Shed, etc., at Knutsford Workhouse	Southwark Borough Council	Borough Engineer, Town Hall, Walworth-road, S.E.	d.
*Erection of Museum Building	The Guardians	A. Marshall, A.R.I.B.A., King-street, Nottingham	Oct. d.
Wards, Union Workhouse, Dudley	Walsall Union	A. H. Lewis, Clerk, 29, Leicester-street, Walsall	d.
Furnishing New Workhouse Buildings	Tynemouth R.D.C.	A. S. Dinning, 21, Ellerton-place, Newcastle-on-Tyne	d.
2,350 Super yds. White Chip Pavings, etc., Willington	Hull Corporation	E. H. White, City Engineer, Town Hall, Hull	d.
Girders, etc., of Bridge over Beverley, etc., Drain	Dundee Harbour Trustees	T. Kershaw, A.R.I.B.A., L. and Y., Bank-chambers, Halifax	d.
250 yds. of Boundary Walling, etc., Waingate Chapel	do.	J. Thompson, Harbour Engineer, J. Dundee	d.
Steel Framework	do.	do.	d.
270 Tons of Portland Cement	do.	do.	d.
Steel Balls	do.	do.	d.
Paving of New Shed	do.	do.	d.
2,400 Creosoted Redwood Sleepers, Eastern Sobun	Chatham Corporation	C. Day, Borough Surveyor, Town Hall, Chatham	d.
172 yds. Wrought-Iron Fencing, Rochester Terrace	Hackney Borough Council	Norman Scobie, Borough Engineer, Town Hall, Hackney	d.
Road Making, etc., Lawrence's-buildings	Redditch U.D.C.	B. Perrins, Surveyor, Council House, Redditch	d.
10-Ton Aveling and Porter Steam Roller	Glasgow Corporation	Office of Public Works, City-chambers, 64, Cochrane-st., Glasgow	d.
Public Convenience, John-street, Glasgow Green	do.	do.	d.
Lavatory, Duke-street, Cattle Market	Broadstairs and St. Peter's U.D.C.	P. Griffith, Engineer, 54, Parliament-street, S.W.	Oct. d.
Lancashire Boiler, Runhilda Pumping Station	Rhondda U.D.C.	W. J. Jones, Surveyor, Public Offices, Centre, Rhondda	d.
Street and Sewer, Lands of Coplew Hill	Manchester Corporation	City Architect, Town Hall, Manchester	d.
Street Improvements	Hull Corporation	A. E. White, City Engineer, Town Hall, Hull	d.
Tea-room, Heston-park	Manchester Corporation	T. Beccroft Atkinson, Architect, 11, Trinity House-lane, Hull	d.
Builder's Work, Underground Convenience, New-se	Weston-Sup'r-Mare A.B.C. Syndicate	E. T. Gilmore, Architect and Surveyor, Weston-Sup'r-Mare	Oct. d.
Alterations to Superintendent Registrar's Office, Hall	Southwick U.D.C.	G. W. Warr, Surveyor, Council Offices, Southwick, Sussex	d.
Six Houses, Coombe Lodge Estate	Metropolitan Asylums Board	Office of Company, Buchanan-street Station, Burton	d.
300 yds. of Flints	Willington Quay U.D.C.	F. Davidson, Engineer, Central-buildings, Walsend	Oct. d.
*Alters, Repairs, and Paving N.W. End of Hospital	Ewell Parish Council	O. Hards, Clerk, High-street, Ewell	Oct. d.
1,400 yds. of Excavat. & Macadamis, Howdon-lane	Richmond (Surrey) Town Council	J. H. Brierley, Borough Surveyor, Town Hall, Richmond	d.
Scavenging	Caledonian Engineering Co.	Engineer to Company, Buchanan-street Station, Glasgow	d.
875 Yards of 9-in. Sewers, Mortlake-rd., North Sheen	Letton-Cum-Sizewell U.D.C.	J. Baldry, Surveyor, Snape-road, Letton, Suffolk	d.
New Roads, Hamilton	do.	do.	d.
Wat. Sup. M'as. Rob'ts, Kitchen Buller-rd's, Letton	Lewisham Borough Council	Surveyor's Office, Town Hall, Catford	d.
Water Supply Mains, Haylings-place, Letton	Borough of Paddington	P. H. Palmer, Engineer, Town Hall, Hastings	d.
Road Works, Homecroft-road, Sydenham	Aston Guardians	Borough Engineer, Town Hall, Paddington, W.	d.
1,000 Tons of Granite	Joint Com. Avshire Northern Dia	Mr. Whitwell, Architect, 23, Temple-row, Birmingham	Nov. d.
*Park Construction of Canal Waterway Wall, etc.	Cheshire C.C. Education Committee	J. & J. Armon, Architects, Irvine	d.
217 yds. of Unclimbable Iron Fencing	Burton-on-Trent Corporation	J. Howarth, Education Offices, Market-street, Altrincham	Nov. d.
Smallpox Hospital, Kilwinning	Earl of Leithrim	O. T. Lyman, Borough Engineer, Town Hall, Burton	d.
5,000 yds. of Stoneware Pipe Sewers, Stepenhill, etc.	M.A.B.	Borough Engineer's Office, Town Hall, Portsmouth	d.
Cast-Iron Rising Main	Llandudno U.D.C.	J. Fennell, Architect, 2, Wellington-place, Belfast	d.
Alterations, etc., Rosapenna Hotel, Carrigart	Swanage U.D.C.	Office of the Board, Embankment, E.C.	d.
*Road Repair, etc., N. Fever Hosp., Wickmore Hill	Teddington U.D.C.	E. P. Stephenson, Engineer, Town Hall, Llandudno	Nov. d.
*Boardroom and Offices, Parkshot	do.	O. A. Bridges, Surveyor, Council Offices, Bognor	d.
Extension of Trinity-street	do.	Council's Surveyor, Town Hall, Swanage	Nov. d.
Steel Work for Covering in Sewage Tanks	do.	O. T. Lyman, Borough Engineer, Town Hall, Burton	d.
*Retaining Wall Along Shore-road	do.	M. Harnsworth, Surveyor, Council Offices, Teddington	d.
Fence and Retaining Walls, Healey-lane	do.	Council's Surveyor, Frinton-on-Sea	Nov. d.
2,607 ft. of 9-in. Stoneware Pipe Sewer	do.	T. W. Aldwinckle, F.R.I.B.A., 20, Denman-st., London Bridge, S.E.	d.
*Sea Wall and other Works	do.	do.	d.
*New Entrance, Floor, etc., to Ladies' Swimming Bath	do.	do.	d.

MORLEY (Yorks).—For extensions to the Rag-Place, Fountain-street, Mills, for Mr. H. B. Watson. Messrs. T. A. Buttery & S. B. Birds, architects, Queen-street, Morley:—
Builder: Pearson & Alnsworth, Britannia-road, Morley* £104 0
Joiner: J. Asquith, Peel-street, Morley* .. 64 0
Slater: J. Atkinson & Sons, Ltd., Whitehall-road, Leeds* 25 15

NEWARK.—For making and forming 800 superficial yards of road at new infirmary, Bowbridge-road, for the Rural District Council. Mr. A. Marshall, architect, King-street, Nottingham:—
 F. Whitelecke £95 0 0 | W. Smith, C. E. Cox .. 298 11 8 | *Builder,* J. Bradley .. 280 18 0 | Newark* .. £271 10 0

NOTTINGHAM.—For warehouse, cottage, etc., Trades-street, Nottingham. Messrs. A. R. Calvert & William R. Gleave, architects, 18, Low Pavement, Nottingham:—
 W. H. Whitton & Co.* £1,183 [Lowest of twelve tenders.]

NOTTINGHAM.—For shops, Colwick-road, Nottingham. Messrs. A. R. Calvert & William R. Gleave, architects, 18, Low Pavement, Nottingham:—
 T. Barton & Co.* £814 [Lowest of ten tenders.]

OSWESTRY.—For laying-out and construction of new street, sewers, etc., at Brynrafod. Messrs. Shaylor & Ridge, surveyors, Oswe-try:—
 I. Jones £93 0 0 | W. H. Thomas, T. Taylor 580 0 | Salop-road, J. E. M. Jones .. 575 0 | Oswestry* .. £327 10 Jones & Evans .. 223 10

PENISTONE (Yorks).—For constructing sewages disposal works for the Urban District Council. Messrs. Spinks & Billing, engineers, 20, Park-row, Leeds:—
 G. Freeman & Sons, Hollinwood, Oldham* £2,690 19 7 [Sixteen other firms tendered.]

PONTYPRIDD.—For private street works, Graiz-street, for the Urban District Council. Mr. P. R. A. Willoughby, Engineer and Surveyor to the Council, Pontypridd:—
 W. Davies £1,032 | A. G. Collins & Co., R. J. Mathias 991 | Barry* £802

PONTYPRIDD.—For widening of carriageways and footways, Cliffrudd, for the Urban District Council. Mr. P. R. A. Willoughby, Engineer and Surveyor:—
 G. Rutter £1,115 | A. G. Collins & Co., M. Griffiths 1,112 | Barry* £975 W. C. Hunkley .. 991

PORTSMOUTH.—For fitting up new branch store in Eastney-road, for the Portsea Island Co-operative Society, Ltd. Mr. G. E. Smith, architect, Victoria-road North, Southsea:—
 Maund, Old-street, London £597 10

SOUTHAMPTON.—For the rebuilding of Nos. 43 & 45, Above Bar, for the Hampshire Advertiser Printing and Publishing Co., Ltd. Mr. William Burrough Hill, architect, Southampton:—
 A. Wright & Son .. £11,075 | Jenkins & Sons .. £10,576 Playfair & Toole .. 10,970 | J. Nichol 10,543 J. Harris 10,817 | Golding & Ansell 10,290 F. Osman 10,795 | Dyer & Sons, H. Stevens & Co. .. 10,773 | Southampton* .. 9,998 H. Cavete 10,753

SPARKHILL.—For private street works, Sparkhill, near Birmingham, for the Yardley Rural District Council. Mr. A. W. Smith, Engineer and Surveyor, Council House, Sparkhill, near Birmingham:—
 W. H. Jones, Great Tindal-street, Birmingham* £3,052 15 6 J. Young, Oxford-street, Rugby* 2,981 14 0

SWINESHED (Lines).—For erecting an infants' classroom, etc., Cowley's School, Swineshead, near Boston, for the Managers of Cowley's School. Mr. J. Rowell, architect, Church-lane, Boston:—
 Rose & Son £700 0 0 | Langley & Sons, Richardson 484 0 0 | Kiron, near Mowbray 460 8 4 | Boston* £360 0 0

WALTHAMSTOW.—For Mission Grove School, for Walthamstow Urban District Council (Architect's department). Mr. H. Prosser, architect. Quantities by Mr. G. T. G. Wright, F.S.A., 3, Great Winchester-street, E.C.2:—
 J. & J. Dean £11,715 | Lawrence & Son .. £10,692 Martin, Wells, & Co. 11,730 | Battley, Sons, & Holness 10,674 Stimpson & Co. 11,700 | A. J. Bateman .. 10,657 Sands & Burley .. 11,500 | Knight & Sons .. 10,497 Mvall & Upson .. 11,355 | F. J. Coxhead .. 10,200 Pollard & Brand .. 11,000 | Rowley & Iros, R. & E. Evans .. 10,721 | Tottenham* 9,063

WHITWICK (Leicestershire).—For erecting Holy-cross new church, for the Rev. M. J. O'Reilly. Messrs. McCarthy & Co., architects, Central-chambers, Coal-ville. Quantities by architects:—
 O. Hodges £6,990 | Bradshaw Bros. .. £5,856 Lower & Sons 6,730 | E. Orton 5,214 Atkin Bros. 6,185 | Griffin Bros. 5,733 W. F. Harding 6,160 | E. Bradford 5,598 Barker & Son 6,038 | C. Wright 5,499 A. Faulks 5,938 | W. Moss, Coalville* 5,455 T. Hubert 5,946 | Storer Bros. 5,273 [Architect's estimate, £5,700.]

YARDLEY.—For new surface water drains and gullies on Stratford and Warwick main roads, for the Highways and Bridges Committee of Worcestershire County Council. Mr. J. H. Garrett, County Road Surveyor, Shirehall, Worcester:—
 T. J. Mason £298 16 0 | B. W. Flitz- J. White, jun. 691 2 6 | maurice & Co. £267 0 0 Sutherland & Curral, Lewis, Thorne 593 18 0 | & Co. 558 0 6 G. M. Kerry & Co. 578 3 0 | A. Cooper 506 17 0 T. Price & Son 576 3 6 | S. Wood 479 1 6 E. B o r e r e , Smethwick* 400 14 4

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The Builder.

VOL. LXXXVII.—No. 3221.

OCTOBER 29, 1904.

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Design for a Crescent Street.....	By Mr. F. P. Hiorns, A.R.I.B.A.
Warehouse and Offices, Queenhithe.....	Mr. F. E. Williams, A.R.I.B.A., Architect.
Dining-room, Palace Gate House, Kensington }	Mr. C. J. Harold Cooper, Architect.
Interiors, House in Stratton Street }	

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Research in Early Christian Architecture.

IN the field of architectural inquiry a constantly increasing interest is centring round Rome, the Byzantine Empire, and its provinces in nearer Asia. In this, as

many other branches of inquiry, the specialist must as yet be dominant.

In some future time we may hope to have a well-balanced and comprehensive survey of the entire subject of Early Christian architecture, a survey which should include Georgia, the shores of the Red Sea, and Abyssinia. We already possess a brilliant occasional work in pure descriptive criticism. Meanwhile, the recent work of accumulating claims our attention.

The second volume* of a series dealing with the results of a privately organised American expedition to Syria which was as recent as 1899-1900 have now got the entire ground covered. De Vogüé in his great work, "La Syrie Centrale," presented in a thoroughly understandable form.

A folio of some 400 pages full of interesting matter, interspersed with photographic illustrations, plans, and diagrams of text, we are better able to appreciate the work which De Vogüé depicted.

Part II. of the Publications of an American archaeological expedition to Syria in 1899-1900. "Architecture and Other Arts." By Howard Crosby Butler, A.M., Boston. (New York: The Century Co. 1903.)

And the work is of very great interest, being, as it is, a most important outcome of the earlier Roman art isolated in a province of the Empire where Christian influences could be built up untrammelled by the conventions of the capital; a province, too, subject to the powerful Greek influence of Antioch, and always susceptible to transient ideas from Persia and the East.

Little wonder then that here and in Asia Minor, the perpetual bridge between East and West, the battlefield of empires, are to be found the steps which disenfranchised the Christianity of the East from the ever-growing Frankish dominion of Christianity in the West. The architectural results in Syria during the first five centuries A.D. are in the highest degree important, largely out of contrast to the beautiful style which seemed suddenly to emanate from Constantinople under Justinian and find its consummation in Santa Sophia. In Syria we find buildings which have some affinity to that style, but the peculiar position of the province, beset by all the influences of the extreme Eastern church, involved it in a style which is peculiar to itself, and which is associated with the lonely hermits and anchorites of the Syrian desert rather than with the pomp of Alexandria.

First and foremost, it must be noted that the prevailing character is strongly Roman, though it is the Roman of Baalbek and Palmyra and Spalato, a distinct provincial style of which hardly a trace remains in Rome itself. But mixed up with this thoroughly

Roman background are other influences about which we know little—influences which produce such an ornamented door-head as is illustrated on p. 374 of Mr. Butler's book, which contains the germ of all future round-arched detail in the West; or, to take another example, the apse at Kalb Lanzeh (p. 223), so strongly reminiscent of IXth and Xth century apses decorated with pilasters in Apulia, Lombardy, and afterwards France. Other examples could be pointed out by the score, which confirm the impression of one great Roman style, found, in the first few centuries of the Christian era, in Syria, Asia Minor, Salonika, and Dalmatia—a style which even existed side by side with the true Byzantine, and survived it in perpetuating the true Romanic style of Italy.

All the work of this period, in Rome itself and in the provinces, was very strongly Hellenised; to what extent exactly requires close attention, and even minute scrutiny, in each individual case. It appears, however, that the severity of the Greek general form with regard to buildings was more appreciated in Syria than in Constantinople, at Justinian's time. This is suggested by Mr. Butler when he points out, with some slight inconsistency, that the arch of the Romans, "a concrete shell," never succeeded in dominating Greek lands, but there became a dry, cut-stone arch, as in Syria. Yet Constantinople (where the vaulted arch prevailed), if not perhaps wholly Greek, was certainly no more Roman than Athens itself in the days of the Empire under Justinian.

Granting, however, that Syria was more Greek, it cannot be admitted that it was architecturally more interesting in the VIth century than Constantinople, as Mr. Butler argues. The statement on p. 183 that the architects of North Central Syria in the VIth century show "far higher achievements in the field of art" than Justinian's architects will not be accepted by most readers. To call Santa Sophia only a great effort of engineering venerated with art will not satisfy when we consider the marvel of its beauty as a space creation. To us, Mr. Butler is merely in love with his subject to suggest such a thing, and, to do him justice, his ideas on the place and influence of his style are discerning enough, though rather thinly introduced.

With one point we are entirely in sympathy, and only regret that he does not call attention to it more systematically, that many forms and details in Syria are suggestive of the Romanesque and early Renaissance architecture of later times. One reference in this connexion is particularly valuable, where the author points out (p. 143) the wall responds to the columns, very rarely met with at this date, in a Basilican church at Dānā.*

In some respects of get-up this book is a model, but in others it is distressingly unscientific. Most of the plans, for example, have no scale attached, and, though in this field it is evidently intended that the book should merely supplement De Vogüé (in so far as he has covered the ground), it is a pity that it should not have been rendered so far independent of the work of the Frenchman. Then, also, though the subject is divided up in a most praiseworthy way, so as to elucidate the styles in three different regions of the country, we are not provided with a map, and, therefore, cannot properly appreciate this division. In points like these we perceive an instance of the tendency (most common in America) to portray archaeological research without the necessary architectural grip which renders it complete.

The specially welcome feature in the volume is the series of photographic illustrations, which enable us most vividly to realise the extraordinary variety of ornament and form in these early buildings in the Romano-Christian (or, as the author would rather call it, the "Greco-Syrian") style. Photographs cannot lie, and, moreover, they alone can give the accurate texture of material. From this volume we are enabled to appreciate more than ever before the sober grace of detail and astonishing originality of plan in such a building as the church of St. Simeon Stylites at Kal'at Sim'an—erected, it is interesting to note, in the VIth century, and, therefore, roughly contemporary with Santa Sophia—from its plan alone almost justifying Mr. Butler's encomium of it as "the most magnificent early Christian ruin in the world." Very acceptable, too, is the division of buildings according to centuries, with the pages clearly headed to this effect.

The last part of the book is perhaps the most valuable, treating of the Pagan architecture of the Haurān as

* Illustrated also in Texier and Pullan's *L'Architecture Byzantine*. Notes LIX.-LX.

opposed to Northern Central Syria. Some examples from this district are truly wonderful as exhibiting the eclectic nature of the ornament employed and the sweeping aside of the conventions of the orders to produce effects which resemble the creations of Renaissance times. The architrave of the order of the temple at Sawdā, for example (illustrated on p. 329), is decorated with a diamond or double zig-zag ornament which suggests at once the Norman chevron; yet it belongs to the century before the Christian era.* The illustration on p. 364, showing a restoration of the gateway at Si, is an anticipatory, by some twelve centuries, of the purest Renaissance style in Italy, as exemplified in the Porta San Pietro at Perugia. We gather from the author's notes on this restoration that enough material was found of fallen blocks and ground plan *in situ* to make the representation tolerably certain. Everywhere we see evidence of the same peculiar fact, a Roman style growing up side by side with the Byzantine, which latter, strange to say, was evolved under apparently similar conditions in an adjacent part of the Empire. Which of the styles was the more Hellenised? Which, even, was the more Roman? Which exercised the greater influence on the subsequent architecture of the West? A glance at some other books recently published may help to clear our minds with regard to these questions.

The third volume of the series, *Storia dell'Arte Italiana*† is akin to the subject matter of Mr. Butler's book, as it deals with the later developments in the West which have just been mentioned. It is by A. Venturi, that very prolific writer on Italian art history. The whole series, along with G. T. Rivoira's *Le Origine dell'Architettura Lombarda*‡ (Part I), published in 1901, and Adolfo Avena's *Monumenti dell'Italia Meridionale*, published in 1902, shows the interest now taken by Italians in their early Christian monuments. Venturi's latest volume deals with Romanesque art, or the development of the Roman style in Christian Italy, as opposed to the Byzantine. From this point of view, perhaps the chief interest of the volume centres in Piedmont and the French borderland beyond Aosta. A chapter is devoted to the developments in South-Eastern France and the similarity between these and the art of Piedmont. The extraordinarily Roman character of portions of the church of S. Trophime at Arles is rightly brought to notice. We see, indeed, from such examples, how near this Franco-Italian art of the XIth century approached the pure Roman style of Alberti in Renaissance times, as exhibited in the façade of S. Francesco at Rimini. The more Gothic part of the cloisters at S. Trophime is well-known, but the delicate and semi-classic luxuriance of such a corner of them as is here

* Another interesting ornament is the cusping formed by a series of semicircles which is so frequently used in outer arch-tines. Cf. also this ornament as a panted border in a plate fragment found at Pergamon. *Mitteilungen des K.D.A. Instituts* (Athenische Abteilung). Band XXIX, *Zweites Heft*, p. 206.

† *Storia dell'Arte Italiana*.—III. L'Arte Romanica. By A. Venturi. (Milano: Uscio Hoepli, Editore Libraio della Real Casa, 1904.)

‡ See the able review of this and other books by Mr. Reginald Blomfield entitled *Byzantium or Ravenna?* in the "Quarterly Review" for April, 1903.

illustrated suggests much more than akin to earlier buildings in Syria and Minor, as well as to the beginning of the Renaissance art.

Turning to Piedmont, a very parallel to the cloister caps of S. Trophime is to be found in the cloisters of Orso at Aosta. Little-known buildings such as S. Benigno in Fruttuaria, S. Stefano, Ivrea, show fine dignified towers. The early parts of the cathedrals at Modena are described in some detail and work at Piacenza, Como, Mantua, and Spalato is noticed. But the volume is more useful in its record of interesting buildings in out-of-the-way places which are entirely unknown to the ordinary traveller, such as S. Secondo, Cortazze, Santa Fede, Cavagnolo al Po; San Giacomo Isola del Lago d'Orta (which exhibits an extraordinary pulpit); and the Madonna della Neve, Castel Aosta. It is in such work that the Italian specialist is best able to take advantage of his intimate knowledge of the country.

The last book to be noticed, Mr. Strzygowski's work dealing with the art of Asia Minor,† is undoubtedly the most important of the three, since Asia Minor is, to a large extent, an unworked field—a fact which is suggested in the title of this volume. Mr. Strzygowski also is a great authority on his subject, and the numbers of the German periodical, *Byzantinische Zeitschrift*, show his scholarly persistence in the study of Byzantine art origins, as reviewer and author. Such books as Wood's *Ephesus* and Texier's *Asie Mineure* deal with the pure classic art of the later Roman work. Mr. Pullan's *L'Architecture Byzantine* and Pullan's *L'Architecture Byzantine* gives some of the work of the Chaldean period, especially the fine lot of churches at Salomika. Hübsch's *L'Architektur der Christen* also touches on the Byzantine field. The interesting Mohammer work of later times has hardly been touched with at all. Texier gives some of the buildings of the Seljuks and the Osmanlis has still to be written.

The part taken by British scholars is chiefly based on the immense research of Professor W. M. Ramsay. *Historical Geography of Asia* has acquired a world-wide reputation in time when very few other scholars were in the field. Mr. Hogarth and Headlam followed Professor Ramsay's lead, and the latter has achieved a thing definitely architectural in his description of a very interesting little-known church (Koja Kalesi). What further research will be undertaken by these and by others in this country remains to be seen, but meanwhile we can be glad that an Englishman has contributed to the volume at present under notice. Mr. Crowfoot's notes, plan and photographs of the churches at Kilise and Utschajak are particularly valuable, as coming from a true archaeologist who is able to take the full architectural data.

* For general history of the Xth and XIth centuries see a French volume just issued, *L'Unité Méditerranéenne Byzantine*, A.D. 867-1071. (Paris: Fontemoine, 1904.)

† *Kleinasiens, ein Neudruck der Kunstgeschichtlichen Aufnahmen von J. W. Crowfoot und J. L. S. bearbeitet von Josef Strzygowski*. Leipzig.

‡ A well-illustrated little book, *Reise in Kleinasien* by Sarre (published, we believe, about 1839), describes Seljuk work in a sketchy way.

§ *Ecclesiastical Sites in Iasuria*. By A. C. H. (Hellenic Society Supplementary Papers, No. 1)

Mr. Strzygowski and his collaborators here dealing chiefly with some hitherto unpublished Byzantine churches. The thing noticeable in the illustrations is the extraordinary diversity of type the buildings presented, a diversity which is quite bewildering unless some definite analysis of the various forms attempted, but which is quite sufficient to point to Asia Minor as the very clash meeting point of Christian art origins. He goes to prove one of the author's standing theories, namely, that it is Asia Minor that the true origins of the Byzantine style must be looked for. He is very persistent, however, in stating the two distinct varieties of type—Hellenistic and the Byzantine—must not be confounded; the first being dome-basilica and the latter a cruciform one. He also quotes a French author, who, to show that Asia Minor was much Hellenised in the early centuries, either Egypt or Syria.

Of the works represented (dealing first with Mr. Crowfoot's notes, which begin the book), one of the most remarkable is the church at Utschajak already mentioned. The photograph (p. 32) it appears as a simple, arched ruin, built in Roman brickwork, ascribed to some period between Constantine and Justinian. It belongs to the two-domed, basilica type. Mr. Crowfoot points out the very interesting detail, though the outside walls are clad with "long, thin tiles laid in beds of mortar," the hidden walls "built of rubble . . . held together by wooden beams, which were fixed round the building, at levels not more than 2 metres apart," the beams being 15 cm. square and still perfectly sound. If this is not later rebuilding, we must suppose that bricks were difficult to get and an older and more primitive method of building was resorted to for the internal wall-work in this church, and that at Tschardagh (p. 69) have apses finishing polygonally and round internally, but the general form of the first-mentioned is interesting. The apse of the latter church in detail has an extraordinary resemblance to Turkish work in fountains, seen at Stamboul and elsewhere.

From an architectural point of view, the most interesting church in the volume is undoubtedly that at Kodscha Kalessi, from Mr. Headlam's work, which is well illustrated by careful plan, section, and elevation, with a photo also of the interior. Generally speaking, this church appears to be thoroughly Roman in plan and detail, but, though at first sight the plan appears to be a three-apsed basilica, it really resolves itself into the cruciform type, the angles being filled up by two side compartments at the apse end and four smaller ones at the entrance end.

The further confirmation of the Byzantine character of this church is found in the details of the upper transept galleries, which suggest the style of Ravenna and Constantinople. At the intersection of the transept there was evidently an interesting roof, shown by the corbelled-out pendentives, supported on little pillared columns. The peculiarly Roman stamp is given to the building by the entrance porch and in the engaged columns which mark the division of the bays in

nave and transepts. The entrance front, as shown in the elevation of it, resembles the work of Roman Syria, and the central door is in the style of those at Baalbek. But a still more notable resemblance is that of the general character of this façade to the entrance front of the Roman basilica of S. Salvatore (Chiesa del Crocifisso) at Spoleto. In both we see the sense of plain wall space grandly broken by doors below and windows above in a manner which must have been the very grammar of the first Italian Renaissance architects.

Mr. Strzygowski divides these Asia Minor buildings into four types—basilica, octagon, dome-basilica, and cross-dome-church (*Kreuzkuppelkirche*). On the whole, he is perhaps justified in placing Kodscha Kalessi among the dome-basilicas, though the only radical difference between it and the western part of the double church at Ephesus (p. 142), which is quoted as a cross-dome church, lies in the finish given to the ends of the aisles. The same applies to the underground church at Chrysokephalos (p. 153). The plan-type of these churches was afterwards used in Italy, perhaps by Greek builders, notably in San' Nicola at Bari.

Turning to the cruciform churches, the most complete example given is the small church at Aladscha Kisle (p. 139), though the much ruined church at Philippi is more important from its size. In this connexion it is interesting to note two aspects in the origin of the cross, one presented from Asia Minor and the other from Syria:—(1) In successive attempts to partition up a single chamber, and to diversify the plain basilican type. (2) In the frank acceptance of a great cross form obtained by conglomerating four basilicas, as in the Syrian church of St. Simeon Stylites.

But we must hasten to conclude this survey of an extremely interesting book. After referring to the pronounced cross form of the church at Rocella di Squillace, in Italy, a short chapter on the dates of the various buildings presented is followed by another on the "Syrian façade-type," in which the west front of Kodscha Kalessi (before alluded to) is duly brought in. Then follows a chapter entitled "Asia Minor between the East, Greece, Rome, and Byzantium," dealing with the influence of Asia Minor on Byzantium, owing to its unique position between the three great sources.

Mr. Strzygowski may possibly be right in claiming that Asia Minor was not only more saturated with Hellenism in those times than either Syria or Egypt, but was the parent roof from which the art of Byzantium sprang. We are principally indebted to him, however, for his scholarly arrangement of architectural facts, many of them new, in a book which is the first definite attempt at anything like a complete survey of the lesser-known Byzantine ground in Asia Minor. The arrangement of the buildings in their various sections is admirable, a contrast to the terrible jumble of matter presented in some Italian histories. Some such arrangement as this is indeed necessary, when we already have a bewildering list of books dealing with various branches of this subject, many of them having the record of facts so

saturated with discursive critical matter that their definite value as scientific acquisitions becomes doubtful. We are at present only in a preliminary stage. The fact that so many interesting buildings as yet remain undiscovered, or at least unpublished, is a warning against much theorising.

More and more, however, we are arriving at what is wanted—the careful presentation of actual buildings, considered as such, and as telling each its own structural and architectural story; and not as abstractions in bygone styles.

NOTES.

WHATEVER opinion may be entertained as to the policy of the London and North-Western Railway Company in connexion with recent abortive negotiations, it must be admitted that the energy displayed by their engineers for the protection of the line has been beyond all praise. Owing to successive inroads of the sea, two great breaches have been made in the sea wall—one about 250 yds. wide and the other from 30 to 40 yds. wide—and it seems probable that nearly a mile of the Dee embankment will be swept away. At the point where the sea first broke through, the land has been eaten away, to a depth which is said to be from 15 to 20 ft. lower than the foundations of the permanent way. Quarry stones, slag, and clay have been delivered in enormous quantities and deposited in the breach and in the newly-formed lake. Material continues to be received at the rate of 3,000 tons daily, part being conveyed on temporary lines to the foreshore for filling the breach, and part to the land behind, where it is employed in the construction of a new stone embankment. The magnitude of the operations may be gathered from the statement that more than 50,000 tons of stone and 6,000 bags of sand have already been used on the site. It is satisfactory to find that the high tide of Saturday last, while causing further damage to the sea wall, had no effect upon the new stone embankment. All the work to which we refer constitutes no more than a temporary protection to the railway, and when immediate danger has been averted a massive sea wall will have to be built for a considerable distance along the shore of the estuary. Preliminary borings are being made with the object of ascertaining the character of the subsoil and the depth at which bed rock occurs for the foundations of the new work. The expenditure to which the railway company are now committed will be enormous, and the recent history of the Dee embankment strikingly demonstrates the wisdom of the adage that "A stitch in time saves nine."

A LETTER addressed by Mr. Pretynan, M.P., to a committee of local authorities and others in Norfolk, comes as a confirmation of the idea contained in our "Note," of October 15, relative to coast protection. The writer says that no one

knows better than he the heavy cost of sea defence work falling upon local authorities and private individuals who own sea frontages on the east coast. But, he continues, "although the burden is heavy, it only bears a small proportion to the increase in value which sea frontages in these districts have acquired in recent years." That was just our point. Owners of property on the coast have the remedy in their own hands, and if they will take measures to prevent inroads by the sea the value of their lands will be vastly increased, and their native land will be conserved. The worst of it is that property owners are not only unwilling to execute protective works, but continue the suicidal practice of removing beach material, which cannot possibly be replaced save by further destruction of the cliffs.

The State of the Rhine. WE are accustomed to look upon Germany as one of the European countries where inland navigation is conducted in a manner that puts to shame our puny efforts in the same direction. Therefore it is surprising to note the unsatisfactory condition of the river Rhine at the present time. Although a sum of 300,000, has been spent by the authorities of Strasbourg in improving the port, the upper reaches of the river are in such condition that navigation is impossible for ships of any size, and sundry German steamship companies are now suspending their services. An important part of the trade of Strasbourg depends upon water transport, and the existing state of things is naturally causing much anxiety. Some pessimists allege that a period of fully fourteen years must elapse before the Upper Rhine can be made suitable for the larger types of vessels hitherto used. We cannot believe this estimate to be a correct one, and as various associations interested are taking the matter up, it may be hoped that prompt action will effect a speedy improvement, although the consequences of past neglect may not be entirely removed for some years.

Another Railway Accident in Glasgow. GLASGOW seems to be rather unfortunate in the way of accidents at railway stations, for last week another train ran violently into the buffers at the end of a platform—this time at the Central Station—with the result that one van jumped over the buffers and demolished a newspaper stall, sending the roof flying across the station. Four men were injured, but fortunately there was no loss of life. The mishap was due to the unexpected failure of the brakes, a type of apparatus upon which railway companies appear to place an implicit confidence which is scarcely justifiable. No doubt traffic is facilitated by running trains into the docks of a station at fairly high speed, but the practice ought not to be allowed unless powerful hydraulic stationary buffers are provided to safeguard passengers and others against the consequences following any failure of the brakes. Independent provision of the kind would still be necessary even if the brakes adopted by British railway companies were of the most modern and improved types, for the most perfect mechanical appliances will go wrong at times.

The Structural Design of Buildings. An excellent paper on this subject was read recently before the American Society of Civil Engineers. The object of the author, who is an engineer, is to submit a series of specifications for the structural work of buildings, these specifications being intended to cover only the structural features of modern buildings in which steel forms an essential part. Hence it may be said that the paper is addressed more particularly to engineers than to architects and builders. For this very reason we think it should be appreciated by the last-mentioned classes, who may learn from it many things likely to be of service in their everyday practice. The discussion of loads on floors, columns, and foundations is in some respects novel, and will well repay study. A useful appendix contains, in tabulated form, extracts from the building laws of ten large American cities, but we may observe that the most striking feature about these is the lack of uniformity with regard to the specified live load, the variations being accentuated by the fact that some of the laws permit a reduction on the permissible live loads for columns and foundations, while others do not allow any such modification. No reference is made in the specifications to concrete-steel, an omission which the author justifies by the consideration that it is better not to include specifications for work executed in this material before the Report of the committee appointed by the Society to investigate the subject has been compiled. Bearing in mind the large share taken by American engineers in building construction, we anticipate that a most instructive discussion will follow the reading of this paper.

The "King's Board," Tibberton. WE have received from the author, Mr. W. H. Medland, an interesting and well-illustrated pamphlet on "The so-called King's Board at Tibberton Court, near Gloucester," reprinted from a paper published in the Transactions of the Bristol and Gloucestershire Archaeological Society. It is a building decagonal on plan, five sides closed with solid masonry, the other half open with delicately cusped arches of apparently XIVth century date, between which are elaborately carved spandrels with sacred figure subjects, among them the Entry into Jerusalem, the Scourging, the Last Supper, and the Crucifixion. This interesting little building, which is but 12 ft. in diameter, formerly stood in Westgate-street, Gloucester, and was taken down in 1749, and rebuilt in the grounds of Tibberton Court. Although described by writers at that period as a "market" Mr. Medland suggests that it was more probably used as a preaching cross, and the Biblical subjects of the sculptured spandrels seem to point certainly to a sacred use. A ground plan and conjectural restoration is given in one of the plates, and a capital series of small photographs illustrate the carved detail. Paul's Cross and the Market Cross at Malmesbury are also illustrated, and mention is made of the very beautiful little preaching cross in the churchyard at Iron Acton in the southern part of the county.

The Memorial to John of Dunstable. THE memorial which the London Section of the Incorporated Society of Musicians has had placed in the Church of St. Stephen Walbrook, consists of a tablet of Hed Wood stone, in which the inscription is incised, within a simply designed frame of Beer stone, and having two panels of glass mosaic, executed by Messrs. Powell and Sons, of Tudor-street. The upper panel represents three musicians against a background of deep blue and starry sky, emblematic of the attainments of Dunstable, whilst eminent as a mathematician and an astronomer, also enjoyed European fame as a musician. He died on December 24, 1453, and is buried in the former church built on the east side of the Wall Brook in 1412 by Alderman Robert Chycheley. The original inscription on his tomb, transcribed in Weever's "Fulham Monuments," is now reproduced on another epitaph by John de Wheathurst, Abbot of St. Albans, is given in Fuller's "Worthies." Dunstable played a chief share amongst the musicians in the development of music in the XVth century, and his learned treatise, "*De Mensurabili Musica*" is quoted by Franchinus, Ravenscroft, and others. Examples of his works are preserved in the British Museum and Lambeth Libraries, also at Rome, Dijon, Bologna; Franchinus printed his "*Sancti Spiritus*." In the Bodleian Library is a collection of tables of longitudes and latitudes calculated and written by him in 1438.

The Goupil Gallery. THE Autumn Exhibition at the Goupil Gallery includes as its principal feature a collection of eighty-nine pencil sketches of architectural subjects by Mr. Fulley. While we are great admirers of this artist's oil and watercolour paintings, we are not sure whether he is not seen to more advantage in his pencil sketches than in any other of his productions, and we are therefore much pleased to see a collective exhibition of them. The special value of these works is that they are pure drawings of architectural subjects by an artist who has made a special study of architecture and understands it, and at the same time they have the freedom of an artist's touch and style, and are not to be ranked with what are ordinarily called "architectural drawings." They illustrate a good many different localities—churches and street scenes of various places in England and on the Continent. There is no necessity to particularise, for all are equally good, and should excite much interest to architects. One of them, the Clarendon, Oxford, has been reproduced in our pages; and there is a small sketch of St. Peters which was the origin of the larger water-colour drawing which was also reproduced in this journal, and arranged with the artist. The outer room, and the inner room of the Gallery is occupied by a miscellaneous collection of oil paintings. These, taken as a whole, that rather too great liberty towards what is called breadth, sometimes degenerates into "sloppiness," which is more or less the case in the Goupil Gallery exhibitions. Jures' picture, "Delivering Joseph's

acob" (18), is so sketchy as to be almost unintelligible—what the French call a *pochade*, more like an artist's rough sketch of composition and effect than a drawing with any claim to exhibition; and the same artist's big sketch of "The Prodigal Son" (44) we had to give up after a vain attempt to find out which was the figure of the prostrate figure. Among the landscapes are two or three beautiful ones by Mr. Leon Little, whose collection at this gallery we noticed some time back; we may mention especially "The Stream, Autumn" (24), a beautiful little landscape. Several other landscapes by Mr. Weiss have a somewhat gloomy power; Mr. W. Lewis has two or three bright little sketches in which buildings are prominent; there are two or three works by the Sidaner in his usual style. Mr. Henry's "Goldfish" (5), an engraving with the figure of a lady, is a real work of art with a consistent style in every part. M. Aman-Jean's lifesize group, "Confidence" (33), looked better in the large spaces of the New Salon at Paris; but out of scale for so small a gallery.

THE pencil drawings of architecture by Mr. Haig, in one of the rooms at the Fine Arts Society, are more specially architectural drawings than those of Mr. Love above referred to; architectural drawings of the first order as such, beyond praise in clearness and accuracy of drawing, and (in many cases) in the way and finish of execution; but they are not the same artistic spirit and quality as the drawings at the Goupil's. Among the very best are two views of the exterior of St. Mark's, numbered 71; beautiful little drawings. Architects the collection is specially interesting not only for the excellence of drawing but for the amount of detail and faithful illustration of architectural monuments in various parts of the room which is here collected. The room contains a collection of Mr. Lewis's well-known etchings of architectural subjects, for many of which the drawings in the other room seem to have been first studies. As we have mentioned on other occasions, we do not sympathise with the use of line in very highly worked drawings, but we have more the character of engraving in feeling being that the special value of etching lies in a freedom of line which engraving cannot imitate. If, therefore, etching is to be used in this engraving style, it is impossible that it will be used with more patient finish or more power of effect than in these sketches, a class of work in which there is in fact no equal at present.

At Mr. Van Wisselhegh's Gallery in Brook-street is a collection of portraits, drawn and etched by Mr. Strang. That room full of powerful work marked by strong originality, goes without saying, but the satisfaction one derives from it is somewhat discounted by the leaning towards ugly and grotesque subjects, among the etchings especially. Such works as "Billiard" and "Evening" (39 and 40) are one with the idea that the artist

finds a kind of satisfaction in studies of the most ugly and unattractive types of humanity; the power of treatment is unquestionable, but why waste it on such subjects? "Mourners" (32) is a pathetic study, and "Death and Doctor Hornbook" (36) a piquant illustration of a poem the grotesque humour of which is quite in Mr. Strang's own vein. The class of portraits founded on Holbein's manner of execution, to which special attention is directed in Mr. Binyon's preface to the catalogue, are very interesting as to execution; but when Holbein's name is mentioned in this connexion, one cannot but feel that they are very deficient in the character and dignity which belong to the great Dutchman's portrait studies; whether or no it be that the artist has not been fortunate in his models, there seems a great want of life and expression in these heads. Among the drawings "Jacob and the Angel" (1) is a poor conception of the subject; "The Creation" (8) has a curious touch of the naïveté of Blake about it; "Hagar" (27) is a very fine composition, though we certainly never gathered that poor Hagar was turned adrift without even clothes to cover her. Two drawings to which we can give unrestricted admiration are the two gold-point studies of partially draped figures. These are exquisite, and show that Mr. Strang can do perfectly beautiful things when he chooses, in spite of his too frequent adoption of unpleasant and grotesque subjects.

THE Late Professor Kerr, of whose life a brief notice will be found in our

Obituary column, had for some years been prevented by ill-health from taking an active part either in the practice of his profession or in attendance at architectural meetings. Those, however, who were in the habit of attending the meetings of the Institute of Architects previous to that period will remember very well what a large place Professor Kerr filled in them by his energy and vigour, his fighting capacity in discussion, and the possession of a gift of fluent and effective oratory which would have been regarded as exceptional in any gathering of Englishmen. He may not always have made the most judicious use of this gift, but he kept things alive at the meetings, and he was always worth hearing. He was also a frequent and able contributor to the discussions at the Architectural Association meetings. This kind of personal power enabled him to fill a larger place among the architects of his generation than he might otherwise have done; for he never had an extensive practice, nor can he be said to have accomplished much in actual architecture. But his little book "Newleaf Discourses," published as early as 1846, was really a remarkable one for its period, anticipating some ideas in regard to modern architecture which are common-places now, but were not so then. It is in the form of conversations between two architects, representatives of what he regarded as the Old and New School, and is very well done; indeed, it is a question whether its literary and critical merits would not justify its republication; we believe it is long ago out of print.

NOTES AND SKETCHES IN SOUTHERN ITALY.—IV.

TRANI.

THE city of Trani was at the height of its prosperity at the period of the Norman dominion, although it had existed for some centuries before that time, since several small Roman remains still exist (such as the lower stones of military columns of the Emperor Trajan, which are in the Via Duomo), and the acts of the martyrdom of S. Magnus, Bishop of Trani in 195, and the Tavola Peutingeriana, of the period of the Antonines, show that it existed at those times. It belonged to the Duchy of Beneventum in the VIIIth century, having been taken from the Greeks. The Saracens devastated it in 840, and again in 1009. It was the last Apulian city to yield to the Normans, having been conquered by Pierre de Hauteville on the octave of the Epiphany, 1073. It made itself a free commune, and, with Bari, Troja, and Melfi, defeated the army of Roger, Count of Sicily, at Bisignano, in 1137. Two years later it capitulated and became part of the Norman kingdom. The castle (now a prison) was re-built by Frederick II. on the site of one of King Roger's, which the citizens had destroyed in 1137. An inscription gives the date of 1233 as that of his restoration, but it was a good deal altered by Charles I. of Anjou, and again subsequently. Three of the four towers remain, with connecting curtain wall, which defended Frederick's Royal residence. In it Manfred celebrated his marriage with Helena, his second wife. In the wars between Giovanna I. of Anjou and Lewis of Hungary, it was held by Alberico da Barbiano until the battle of 1344, which gave the kingdom to Charles of Durazzo and to Barbiano the lordship of the city and the title of Grand Constable. Giovanna II. gave the same rights to Sforza Attendolo, and to his son Francesco, who became Duke of Milan. It remained constant to the Angevins during the war between Alfonso of Aragon and Lewis and Giovanna of Anjou, but later, when Ferdinand the Catholic was fighting with Lewis XII., called in the Venetian republic to liberate it. Till the rout of Agnadello in 1509 they occupied it for twelve years, and again had it twenty years later, when, after holding it a few months, they ceded it to Charles V. Its importance ceased with the establishment of the Spanish vice-royalty.

It had a walled-in port in Norman times, and the maritime regulations, published by the consuls of Trani in 1063, form the most ancient mediæval commercial code known. In Charles II. of Anjou's time the port was re-constructed (1272), and eight years later it had a chain to close the mouth 340 ft. long. In Giovanna II.'s time (1372) the Venetians damaged the structure of the port, and a great tempest finished what they had begun. The present quays and piers are of the XVIIIth and XVIIIth centuries. Trani fishermen frequent the islands of the Greek Archipelago and even go as far as the Black Sea and the Sea of Azov. During the XIVth, XVth, and XVIth centuries it had a flourishing commerce. There were two Venetian Consuls, quarters belonging to Genoa, Ravello, Amalfi, Pisa, and Florence, and a Giudecca, which was so full of Jews as to require two synagogues. In the peace between Ferdinand of Aragon and the Prince of Taranto (1403) one of the articles was "that the city of Trani shall not be given in feud to anyone."

The cathedral stands upon the site of a much older church near the sea. Beneath it are crypts upon two levels, the lower being merely rough construction, without mouldings or ornament, except some traces of painting. Cavaliere Sarlo thinks it as early as the VIIIth century, the crypt of S. Leucio, in which his body was deposited in that century. Sig. Carabellese, however, believes it to be later, either the VIIIth or IXth century. The church, which is now the crypt under the nave, was always sunk somewhat beneath the surface. It was dedicated to the Virgin, and has a nave and two aisles separated by two rows of eleven antique columns, some of granite and some of oriental marble, with bases of antique form, but with rough caps of limestone, except in two cases, where marble caps, which were probably imported from Constantinople, remain. Some of the columns have been cut up to make them fit, and they generally have a cross carved on them. The nave roof is a wagon vault, and above a side altar or tomb is a painting on the vault, the figures of the



The Cathedral, Trani.

Evangelists. In this cathedral the Bishops of Canosa sat, after the destruction of that city in 813 by the Saracens, till the see was transferred to Bari. Towards the end of the XIIth century a young Greek pilgrim arrived in Trani, who carried a cross, and marched, singing "Kyrie Eleison" without ceasing. His acts of charity and the statements which he made to Bisanzio the bishop, caused the citizens to look on him as a messenger of God, and, after his death, Urban II. canonised him in 1090, and he was accepted as patron saint of Trani under the name of S. Nicola Pellegrino. An addition had been made to the cathedral in the shape of a transept with an eastern apse, in which his body was deposited. On the north and south two corridors were added, and on the enlarged site the present cathedral was raised towards the end of the XIIIth century. Work went on until the middle of the XIVth, when the Campanile was finished. The eastern portion of the crypt, called the Soccorso di S. Nicola, is divided by a wall from the other crypt. The vault (which is quadripartite) is supported by twenty-eight slender columns of Parian marble, in three rows of eight each, with four in the apse, eighteen pilasters on the walls, and two engaged columns at the angles of the apse. The capitals are also of marble, and carved with different designs, Romanesque based on the Corinthian. The date of 1094 is given by an inscription near the principal door as that when the cathedral was commenced, and, if that is so, it is due to Bishop Bisanzio, who lived till 1126.

The upper church is entered from the west only, and is approached by a double flight of steps leading to what was once a portico before the doors. This portion was completed in the XIIIth century under the Hohenstaufen, and served as a meeting place for the council of the city, as in so many other Italian cities. Between the columns seats were built for their accommodation. The parapet which surrounds three sides has a richly-carved cornice. The central door is linked with the side doors by a wall arcade, with sharply cut foliage, etc., surrounding the architrave and well-designed caps, as shown in the drawing. It has a very richly-carved archivolt and side posts, in which figures and animals struggle through the interspaces of scroll-work, and a second projecting arch, which rests on two slender marble columns, borne by figures of lions, one of which holds a struggling man in his claws and the other a serpent. A block upon which human figures are carved as if supporting the column is between it and the lion. In the central doorway are the celebrated bronze doors made by Barisano of Trani for Sergius Muscettola, which contain many of the same panels and ornaments as those which he used at Monreale and Ravello; above it the wall formed a kind of pediment, now much ruined. Above this is a two-light window with corbels at its side, ornamented with broad flat leaves; on these elephants stand half-sunken in the wall. On their backs colonnettes rest on the caps of which are lions devouring men, also partly sunk into

the wall. Over the window sits a figure which holds a man in its claws. There are smaller two-light windows above the doors with ornamented facias surrounding them. All these are walled up, their columns being absent. The great rose window above the central window has lost its tracery; it are six corbels on which are figures of animals; and higher still in the gable is a little round-headed window. The side windows have a round-arched wall arcade, with windows of the same shape beneath them, which light the *matroneum*, and similarly in the wall as clerestory. The end of the tower has the arcade continued but with double arches beneath each arch, a cornice, and small two-light windows, and then a further heavily-carved cornice, and a little window above in a low gable. The apses are simple in design externally. The central being more important, is larger than the others and has the usual Apulian window with colonnettes at the sides with apses below, and an oculus above projecting from the wall. The top of the window arch is a griffin, the crypt window below has been altered. The building of this upper church went on till 1140, certainly, with the assistance of subsidies from the citizens. The interior is finely proportioned. The nave has twenty-four columns of Numidian granite, marble of Hydruntum, breccia and cipollino arranged in pairs transversely to the axis, the arches are supported with larger voussoirs to the upper part, containing arch, and the triforium, or *matroneum*, has groups of three small arches, the columns sometimes plain and sometimes ornamented beneath a larger round arch without impost or caps. In 1837 the Archbishop of Trani, Maria de Franci covered the whole interior with stucco, and the columns and capitals were hammered over to afford a key. Since that time the two-light windows had been partially walled up in the XVIIth century at the expense of repairing the wooden case. The triforium was also walled up in the XVIIIth century because the church was draughty in the winter, but these walls have been removed, and the original caps and columns are now again visible. The choir stalls are of 1439, and appear to have been paid for by Archbishop Latino Di Ursino, whose arms appear inlaid on the upper stall on the Epistle side. The roof was painted, the date upon it is 1713, and an inscription records that it was paid for by subscriptions. The two side apses had been walled up in their lower parts to accommodate organs. In the right aisle is an altar, which is thought to be that placed in the tomb of Philip of Anjou, Prince of Taranto, and Achaia, son of Charles II., who died in the Castle of Trani, March 24, 1271. Charles I. and Beatrice were also buried in the castle. The lower church was lighted by circular windows in the pavement of the nave until 1791, when a choir near the archbishop's throne a series of mosaic pavement remains, a figure of Solomon riding a beast, and inscribed "1791."

The campanile, at the south-west angle of the church, appears to have been an addition since the cornice of the west front is carried down to the same level on both sides, and the tower is built close against it, and present pierced by a pointed arch one which abuts on a structure which is in connection with the church, and the other on a mass which is arcaded round with niches, and supported by little columned arches. It has five stories, and its height to the summit of the spire which terminates it, is almost exactly equal to the length of the cathedral. It is a square. The design is shown in the illustration. The construction shows different epochs. The first includes the basement, with the second story, and this part is signed in the first story letters, "Nicolaus sacerdos magister me fecit," under the cornice, probably the same man who signed the altar at Bitonto as simple "magister" in the third story is the work of another, and the fourth and fifth of yet another, and the highest portion was completed between 1305 and 1365 by Archbishop Jacopo Tura. During this time Trani possessed several eminent designers and craftsmen, whose names come down to us. Besides prot. Nicola, there was Anseramo da Trani, the chorium of the Cathedral at Bari, the chorium of the Cathedral at Bari, the chorium of the Cathedral at Bari, called Riccaccio da Foggia, Tranes called Comacine in a deed of the archbishop Terlizzi, and Barisano.

The next most interesting building in Trani after the cathedral is the church called by Schulz and Avena "Ornissanti," in the Via Ornissanti, but known also as Ss. Annunziata, and once known as "delle anime in Purgatorio." It is the only Apulian church which retains its triumph, or porch. It existed in 1170, when the avellane Orso Rogadeo left it property in his will. Avena says it shows a pre-Romanesque type of church, but it has a wooden roof over nave and barrel-vaulted aisles in the usual manner. Externally the side apses have only slight projection, each has a little window ornamented with a pearly band, as at the cathedral, and a very beautiful band of elaborate ornament surrounds that of the central apse, with a lion and griffin holding beasts in their claws at its springing; below is a lion on each side with a figure in its claws, on his back is a slender colonnette with a Norman cap. Above the porch the wall is raised so as to form a wall-like building above the aisle, terminating in a gable with a two-light pointed opening with a central shaft, a bell turret. The atrium is quite Byzantine in style. It has in front of it three doors two free columns and one engaged in the wall at each end (on the left cased up by a pier), the façade of the portico having three arches, one pillar with a cap and a rather broad pier between two pilasters. Each side of the central door is a pillar with top of figures above a row of acanthus leaves and a cable moulding. Corresponding columns are sunk in the angles without figure sculpture. Around the central door the wall is sheathed with marble, and above it Byzantine reliefs of the munciation in two panels are inserted in the same manner as at S. Mark's, Venice. The arch is richly carved with arabesques, dissimilar on the two sides. The side doors have arched archivolts, their tympana are curiously divided—two small portions of circles rise from the lintel, and they and the space between them and the arch have bestial subjects carved on them, peacocks and monsters. The arches below the vault have their voussoirs thicker towards the top. This atrium is defended by a heavy iron grille towards the street. The exterior has been paganised, the eight arches are blind, with mouldings in stucco, but the original slim granite columns remain, and the caps, though whitewashed, with the engaged shafts at the end of the nave arcade and in the aisle walls. Some of the columns are larger than others, but the caps all fit. The mouldings are of classical generally, though the bases are most of them Attic. The moulded abaci are composite, and show so much diversity in outline that they must be original. On the lintel of the principal door are carved five shields of founders, described in an inscription which terminates as follows:—

AB HIS CAV LAM BER
TINO RVM SAM HABVL

Another interesting church is that of S. Francesco, which was founded by the Benedictines of La Cava in 1176. In 1184 it was consecrated by Bishop Bertrand II., and then called S. Trinità. Much of the façade (which is in the playground of the Communal schools) is of the early XIIIth century, the interior is earlier. There are four piers, which have been modernised, and a circular drum, upon which the central cupola is raised, preceded and followed by two flatter ones. To these piers half-piers on the interior wall of the façade correspond to the entrance to the square apse, which is under a quadripartite vault. The principal cupola is octagonal externally, with a fine ornamented band and a pointed roof. The whole design resembles the Cathedral of Mola, the aisles, with their half-barrel vaults, being the thrust of the domes to the outer walls. The façade has a door with a decorated projecting hood on slender columns, supported on carved corbels at about 4 ft. from the ground. The tympanum is a slab pierced with double quatrefoils, as if a square and a trefoil overlay each other. Two arches, one on each side, flank the doorway, rather sunk into the ground. The aisles have square-headed windows, and a corbelled cornice with lions' heads, etc., runs along the gable. The nave wall is a small round-headed window with a slab pierced with simple circles. This is the church described in Schulz as S. Maria macolata; it was given to the Franciscans in the XVIth century, and then took the name of S. Francesco.

The church of S. Giacomo, formerly S. Maria, said by Schulz (and local tradition) to have been the mother church of Trani, and the place

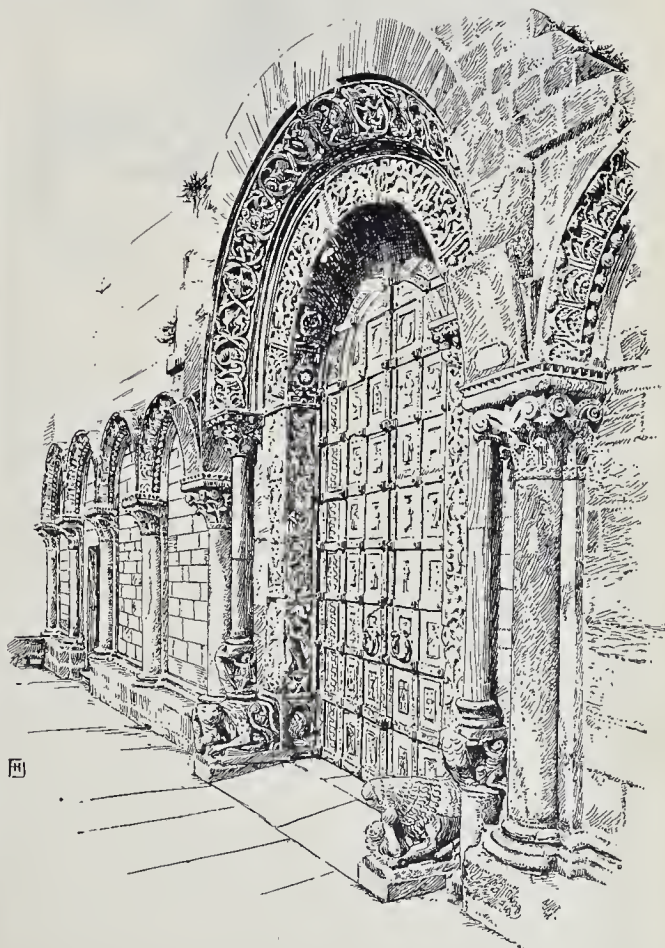
in which S. Nicholas Peregrinus was buried. Cav. Sarlo, however, says it was not S. Maria, but S. Maria de Russis. It is a square church, with angle pillars bearing quadripartite vaulting, the caps of which resemble those at Cefalù and other Norman churches, and a round apse. The interior was burnt out last year, and contains nothing else noteworthy. The drawing shows the exterior with the characteristic Apulian beasts projecting from the walls and the remains of a corbelled cornice at the top of the wall; the door has a decorated moulding round it and pillars at each side supported on what look like hippopotami, but are said to be elephants; on the caps above are a griffin and a lion, the last with a smaller beast in its claws. Another church, S. Antonio, is square, with four thick middle columns, which carry a cupola on round arches. Between them and the engaged columns in the wall are arches and a vault. The exterior is whitewashed, and the door is approached by a double flight of steps meeting on a landing. Against the next house a half-round turret runs up, and the whole appearance is quite eastern, notwithstanding the pyramidal roof over the cupola. Outside the gate, on the way to Bisceglie, is a basilica with nave and side aisles, with half-wagon vaults called S. Maria della Colonna.

There are some very curious relief patterns on house walls, consisting of oblongs and diamonds, etc. In the Gindecca are several elegant two-light windows with slender central shafts, and near the harbour is the building now called the "Seminario," once the official residence of the Venetian Consuls. It has a curious mixture of details, the building being oblong in plan, with lofty walls unbroken by any considerable projection. The entrance door has a round head

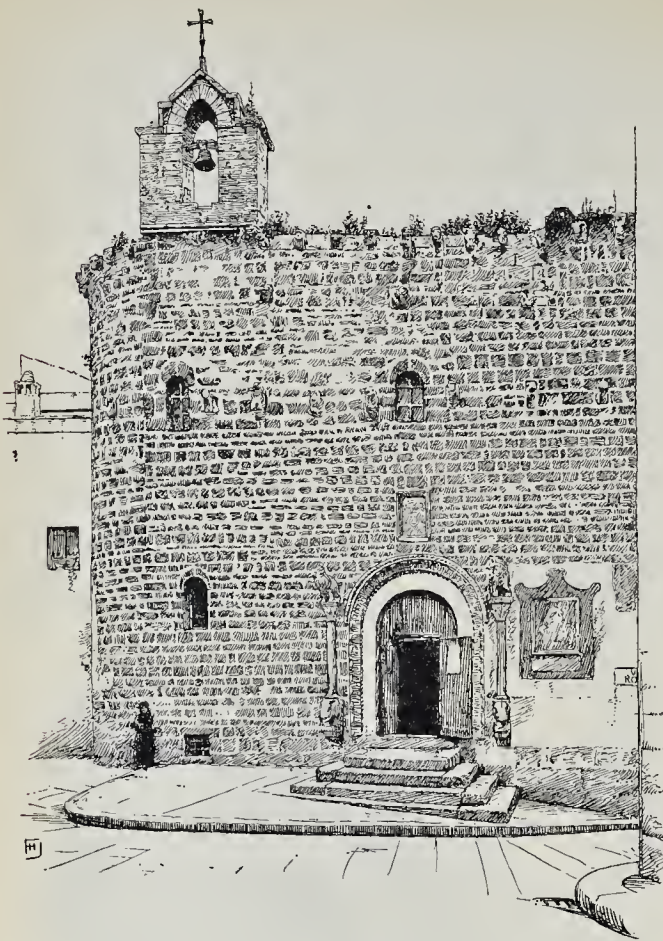
with a carved moulding over it, which is square in general form and supported on colonnettes. On the first floor are two two-light windows, one with tracery and one without, also a square-headed window with four lights divided by three shafts and a large pointed one with a great Norman zigzag round it, like the big window in the campanile at Girgenti. A string course divides this story from the top one, and is depressed to run round the bottom of two other windows which have been altered in later times. The building appears to be of the XIVth century, and the street in which it stands is so narrow as to make it almost impossible to see any details of the upper stories. F. H. J.

THE ARCHITECTURAL ASSOCIATION OF IRELAND.

On the 18th inst. the President of the Architectural Association of Ireland, Mr. James H. Webb, delivered the opening address of the Session. This was the first meeting in the premises now specially acquired for the use of the Association. After mentioning the reasons which induced the Association to take this step, and the circumstances under which the new premises were acquired, Mr. Webb continued:—
"Having provided ourselves with a home, what do we intend to do with it? Of course we will carry on our classes and lectures as heretofore, and I do not think it can be imputed that the members who may be said to run the Association have ever been behindhand in their duty. It sometimes occurs to me, why do they go to all the trouble, and give up all the necessary time to furnish practical instruction to their younger brethren who will in a very few years be competing with them in the battle of life,



Principal Door and Arcading, Trani Cathedral.



S. Giacomo, Trani (see page 437).

and altogether without fee or reward? But, as a matter of fact, I think it will be found that, apart from the innate pleasure of doing your duty and benefiting mankind in any way that lies in your power, the instructor or lecturer derives as much, if not more, benefit than the student. It has been said that to perfect one's self in anything it is wisest 'to first read it, then write it, and then teach it,' and I am sure that such of you as have made up a subject for a lecture will agree with me that they got to know more about it than they could have done by simply reading for their own instruction.

We hope shortly to form a museum in one of the rooms on the lower floor; in fact, some specimens of timbers and stones were gathered together some years ago by the then secretary—we have been very fortunate in our secretaries—which I believe will be forthcoming, and the committee have also many ideas to work out.

I do not intend to enter into a long dissertation on things in general, or to detain you with an address on nothing in particular; but it is our custom at the beginning of a session to review, as it were, the position we stand in, and also perhaps the general situation, with regard to architectural education. Of course, primarily, we exist for the purpose of architectural education. Our mission is to endeavour to implant in every student a knowledge of what in past ages, and from period to period up to the present, have been considered the best methods of constructing and adorning the houses the people lived in and the temples some of them raised to the Deity, together with any other structures erected by man. If we can get that into a youth's head we are satisfied to let him go on his way and try to do better, if he can.

I often think that we ought to be proud of our mission. We are endeavouring to teach the coming man to do good to his fellow-man. The first two things a human being wants are food and shelter, and it is the architect's province to provide the latter in the best known form. Therefore, if he wishes to become an architect the student must learn what is good and proper, and what is not; or else, unless a man is a heaven-born genius, he is sure to mix his styles or perpetrate those horrors that are so injurious to the health of our good friend, Mr. Orpen. Now, I want to again reiterate and to impress on you students and younger members that this Association is primarily for you, that all the trouble taken by the committee and others is for you, and that it is their hope and wish that we may be able to establish a school, here in Ireland, in which a student will be able to obtain that necessary supplemental education which it is universally acknowledged is necessary if he is to become a really qualified architect. Students, it lies with you if our dreams are to be realised. There is no use our having premises and curricula of instruction, be they ever so perfect, unless you are willing and anxious to make use of them. I know there are difficulties in the way of the boy who is resident in the neighbourhood. He has counter attractions, such as outdoor games and social engagements, which do not affect in so great a degree the provincial who has come to the city for the purpose of serving his time or earning his living; and I think it will be found that the 'foreigner,' if I may so call him, is therefore often found to be the more diligent worker, simply because he has not the home attractions that weigh so much with the city lad and occupy so much of his time. But whether

countryman' or 'Duhliner' it behoves you second the efforts of your elder brethren, benefit yourselves.

At the present time, on the other side of the Irish Sea, they are trying to formulate a scheme by which all existing schools of architecture will be brought under the superintendence of a head board or governing body, which board will be in close alliance or affiliation with the Royal Institute of British Architects, and as a matter of fact will consist mostly of Fellows of that body (at least that is the proposal of the Royal Institute of British Architects). As President I was nominated, by the Royal Institute of the Architects of Ireland, to attend a preliminary meeting of the Board in London which I did. I think it may be possible that some benefit may accrue to the English student—even possibly the provincial English student—by the operations of this Board, but it is not than doubtful that it will be of benefit to us. Our circumstances and surroundings are entirely different to those across the water in any set of conditions or requirements suitable for England would be altogether unsuitable for us. No, what we want is a little self-reliance and not to be afraid of a little trouble. It is a matter of common knowledge that we lack the ability, but we want a little more conceit. We are too modest and inclined to think that others can manage our affairs better than we can ourselves. What I consider we ought to do, and I know there are others who think with me, is to follow up our policy of last year and endeavour to persuade our Institute, the Royal Institute of Architects of Ireland, to formulate a proper and suitable examination, an examination based on the knowledge required by an architect practising in Ireland, such an examination as could be passed by one of our leading architects without it being necessary for him to read up a lot of extraneous subjects, and certainly an examination without catch questions. I think it is no body fitted to draw up and work such an examination but an Irish body; and no body in Ireland so fitted as the Council of the Royal Institute of Architects of Ireland.

Then we have to do our part. It is for the Association to teach the student and prepare him for that examination. Mind, I do not mean to cram him; far from it. If the examination is such as I hold it should be, he will acquire at our classes and lectures the knowledge requisite for the practice of his profession, and it should be our aim to see that our lecturers present the subjects in such a way that not to be retained for a little while and then forgotten. Do not think that this is the dream of an enthusiast. The principle of having an examination has already been agreed to and passed by a general meeting of the Institute, which action, as we know, has placed that body in rather a difficulty with the British Institute to which it is affiliated, but I think our Institute ought to be encouraged by the means in our power to establish an examination of its own. Until that is done our young members have not got any special target to object to work for, and, like school-boys, I am afraid, it is no use preaching to them; it is for their eventual good to work. There are many things that cannot be learned by going through the routine of an architectural office which it is, nevertheless, necessary to know; such as the history of architecture, facility in sketching. As was pointed out by the former President, there is nothing so good as teaching design and construction as sketching; you look at a building or a window, or some object, and then go away and try to reproduce from memory, you will find you have forgotten many of its most necessary features; but if you sit down and try to draw it, no matter how badly, you will find long afterwards you will remember the outline and details quite readily. That, I think, to an architect, is the real test of sketching, apart from the record which such a drawing gives for future reference. I have rather an objection to an architect posing as a third-rate artist as far as the hand or pencil goes; for, after all, with us drawing is only a means to an end, and not, as in the case of an artist, the end itself. If you can imagine it possible for a man to so describe or specify a building as to make it capable of being erected, and the building when erected was suitable to its purpose and pleasing to the eye, and if he could do this without a sketch, drawing of any kind, surely that man would be as great an architect as he who would describe a building by means of the most beautiful

drawings? But, be that as it may, there is no doubt that you can impress an object much better in your memory by drawing it than by merely gazing at it and trying to recollect its peculiarities; and it follows that if you can wield the pencil with facility and ease you are much more likely to spend your spare time sketching than if your efforts have to be labelled to tell that they are. It is surprising how quickly we can get into the way of it, and what a pleasant occupation it is, especially if you are accompanied by kindred spirits such as one meets on the little excursions organised by this Association. Also a friendly hint sometimes saves one much tribulation, and I may say all you that amongst our members there are not a few who can hold their own with the best. Another thing I would like to warn the student against is the danger of becoming a superficial, flashy draughtsman. I have known some who could make a beautiful perspective or sketch, but if required to draw a detail for practical working drawing were quite out of it. There is no use trying to draw a thing that you don't understand; it is necessary to understand first and draw it afterwards—that is, you must learn your building construction before you design. Just as a musician has to learn his harmony, etc., before he can compose.

Students are often shy about joining a class or design club, or even don't like to show others their attempts at sketching; and, of course, it is only natural that they should be, especially at first; but if they once take the plunge they will very likely find that they are just as good as the next man, and perhaps better.

We who have had the privilege of being born in this city have been brought up as it were in an architectural atmosphere; we are conversant from our babyhood with fine examples of classic work, erected, I believe, mostly in the time of Grattan's Parliament. Surely, therefore, we ought to have it in our blood to do good work if we get the chance. Unfortunately, it seems to be the opinion of not only our neighbours, but of our own public, that there is not such a thing as an architect to be found in this country, so that whenever a building of any style or magnitude is to be erected a foreign expert is employed, and sent touring the Kingdoms and the Continent examining examples of the work he is supposed to have at his fingers' ends. It is far for us to make such a state of things impossible by using every ounce in our power to perfect ourselves in our art, and then showing our countrymen, by means of competitions or otherwise, that there are men practising here equal to any.

If the public only knew and understood, even now things would not be so. I fully believe that a client will get better and more loyal service from a qualified local architect than from one who has been imported; so the practice of the profession is purer in this country than elsewhere, and that is one of the things for you coming men to look to—to uphold that standard of upright fair dealing and honesty, that incorruptibility which has been established by our seniors, especially in this city. An architect is employed by his client and is paid by his client to give him the benefit of his technical knowledge and experience and to protect him from those who might take advantage of his inexperience. Sometimes even you have to protect him from himself. The days when an architect made a catch and had finished are gone. Now he has to be half a solicitor with a knowledge of the law, so as to keep his employer out of difficulties. He often has to practically arbitrate between the proprietor and the builder; therefore unless he is an honest, trustworthy man he is worse than useless.

Now I know there are some, even in this country, who do not see eye to eye with me on these matters; who are inclined to think that we are a very small community, and that we are altogether overshadowed by our larger neighbour, and that therefore it would be foolish and almost presumptuous for us to endeavour to establish a regular school of architecture in this country. With regard to such points we stand here in rather a peculiar position, and it is most necessary to take into full account such opinions, especially when they are held by members of this Association. We know that they are honest opinions, and that those who put them forward wish us nothing but good, and are as anxious as ourselves to see this Society successful, and therefore we must give such arguments our full and open consideration. This Association is

made up of men of all shades of political and religious opinion, and I think as far as that goes we are a model that our countrymen would do well to follow. Each one is equal in all respects to the other, and no man thinks of questioning his fellow's right to be heard on any subject within our scope. Therefore what I say is a personal opinion.

I do not see why Ireland can have schools of medicine, a school of law, schools of divinity, schools of engineering, dental schools—in fact, schools of everything, and not a school of architecture. I do not think it can be said we have not enough students; their number makes me quake. We cannot expect to commence in the position that has been reached by others after half a century, but surely we can make a beginning? Cannot we make a start and leave it to our successors to carry on the work from generation to generation, if necessary? Great things have small beginnings. We can hardly expect to be recognised at first throughout the world as a first-class educational body, or that the diploma given by the Institute will be taken as an absolute guarantee of competency; but we can look forward to such things coming to pass in the future, and I fully believe that that future will not be found so far ahead. Let us have a little belief in ourselves; let us strive to better the condition of architecture in this country; let us look forward to that time when the profession of architecture will be on the same footing as medicine or law, and the unqualified, incompetent practitioner unknown in the land. Why cannot we try to do these things for ourselves, instead of waiting with our hands folded until others give us a lead? I believe we can do a great deal to improve our position, and that if we hold up our heads and have a little self-respect, we will be supported not only by our fellow-citizens but by the public of Ireland."

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. J. Williams Benn, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Guardians 1,420*l.* for poor law purposes; Hackney Borough Council, 15,000*l.* towards the acquisition of Springfield Park estate as an open space, and 15,182*l.* for contribution towards Mare-street improvement; Guardians of Poplar Union, 65,000*l.* for poor-law purposes; and Islington Borough Council 160,959*l.* to repay outstanding balances of loans. Sanction was also given to Islington Borough Council to the borrowing of 240*l.* for electric light installation and street lighting purposes.

Addition to Selected List of Contractors for New Schools, etc.—On the recommendation of the Education Committee, it was agreed that the name of Mr. H. L. Holloway, of Union Works, Church-street, Deptford, be added to the selected list of contractors to be invited to tender for the erection of new schools and additions to schools.

Lambeth Bridge.—The Bridges Committee recommended that application be made to Parliament in the Session of 1905 for powers to enable the Council to undertake the reconstruction of Lambeth Bridge. The suggested design for the bridge shows a steel structure on granite piers. With a bridge 60 ft. wide it will be possible to obtain gradients of 1 in 30, which compare favourably with the present gradients. The estimated cost of the scheme is 872,000*l.*, of which 410,000*l.* is for the acquisition of property.

Mr. Strauss (Chairman of the Committee) urged that in the present dangerous condition of Lambeth Bridge the Council should take action, and in the opinion of the Committee the existing bridge should be replaced by a structure worthy of London.

Lord Welby, on behalf of the Finance Committee, moved that the recommendation be referred back to the Committee. He said that, in view of the large amount to which the Council was committed on capital account, further extensive liabilities should not be incurred at the present time. The Council had already undertaken an expenditure of about 2,000,000*l.* for works which were being carried out by the Bridges Committee. During the current and the two following years an annual expenditure of approximately 450,000*l.* would have to be met, and, until these schemes

were nearing completion, the Council should not commit itself to further capital expenditure for bridges and tunnels.

Mr. Bruce seconded the amendment, and showed that the scheme had already been before the Council, when, at the Finance Committee's suggestion, it was referred back. He declared that Lambeth Bridge was only used by local traffic.

Mr. S. Collins and Mr. Burns, M.P., supported the recommendation of the Committee.

Mr. Beaulcroft said that it was scarcely creditable to London that its bridges should be allowed to get into disrepair. If Lord Welby's amendment meant that the subject would be shelved for some years, he should find some difficulty in following him into the lobby. He hoped they would do something. If they could not see their way to reconstruct the bridge, it should be immediately put in a proper and safe condition to meet the needs of the people who lived near it.

Colonel Rotton said that no doubt Lambeth Bridge was in a dangerous condition and required attention, but whether they could spend some 900,000*l.* upon it was a matter which required consideration. He should support the amendment on the condition that when the character of the Westminster improvement was decided upon the improvement of Lambeth Bridge should be discussed.

Mr. Ward was surprised that Lord Welby had brought up no alternative scheme. Some years ago they had called in Sir Benjamin Baker, who told them that the bridge was dangerous. It was then patched up. Now their engineer came to them again and said that the bridge was dangerous. It was the duty of the Council to say that the bridge should be constructed as soon as possible.

After further discussion, the amendment was, on a show of hands, carried by 60 votes to 37.

The recommendation was accordingly referred back to the Committee.

New Lodging-house, Kemble-street.—The Housing of the Working Classes Committee brought up the following report:—

The scheme for rehousing persons to be displaced by the formation of the proposed new street from Holborn to the Strand requires that the Council shall provide on a central site a lodging-house for the accommodation of 610 men, and a site on the cleared area at the corner of Kemble-street and Drury-lane has accordingly been allocated for that purpose. As regards the amount of accommodation which can most advantageously be provided on the site, we are satisfied, after conferring with the officers, that a building to accommodate 699 men can most conveniently be placed thereon. Plans of such a building have accordingly been submitted to, and approved by, the Secretary of State for the Home Department, and the Council on June 21, 1904, gave authority for tenders to be invited from a number of selected firms for the erection of the building in accordance with the approved plans. Ten tenders for the work were received during the recess and opened by our Chairman under the authority given by the Council on July 26, 1904, and the particulars thereof are as follows:—

H. L. Holloway, Union Works, Deptford, S.E.	546,100
Charles Wall, Ltd., Uperene-road, Chelsea, S.W.	47,000
Kirk and Randall, Warren-lane Works, S.E.	48,237
John Mowlem and Co., Grosvenor Wharf, Westminster, S.W.	48,241
F. and H. F. Higgs, Station Works, Loughborough-junction, S.E.	48,400
Leslie and Co., Ltd., St. James' House, Kensington-square, W.	49,130
Holloway Brothers (London), Ltd., Belvedere-road, S.E.	49,300
Foster and Dicksee (Rugby)	49,576
Lawrence and Sons, 14-16, Wharf-road, City-road, E.	49,972
Henry Lovatt, Ltd., London and Wolverhampton	51,600

The estimate comparable with the tenders is 46,250*l.* Provision has been made in the form of contract for certain portions of the work, such as the installation of steam and hot-water services, to be carried out by approved sub-contractors. The house will be similar in character to Carrington House, although slightly smaller in size, accommodation being provided for 699 men, as compared with 802 at the latter. A part of the building, with a separate entrance from Drury-lane, will be set apart for the purposes of a dispensary, for which rent will be received, as it is necessary that the Council should provide such accommodation within the parish of St. Clement Danes in lieu of a public dispensary to be demolished under the Clare Market scheme. By making such provision the payment of compensation in respect of the loss of an annuity will be avoided. The building has been arranged in such a manner as to obtain the maximum amount of sunlight in the internal courts, and uninterrupted light will practically be secured to every room in the building. The disposition of the principal rooms in the house is as follows:—

The entrance is central from Kemble-street, and gives access to the dining-room on the left and to the smoking-room and reading-room on the right. The office commands the entrance for lodgers and staff, and is arranged close to the superintendent's quarters. The dining-room is approached from two main corridors, and is designed to have a central area for light and air to the basement. A hot plate about 20 ft. long is arranged near the centre of the room, with lodgers' sculleries attached, and the lodgers' crockery store and lockers are in close proximity. The shop for sale of hot and cold viands is placed in a convenient position in the dining-room, and has communication with the kitchen in the

basement by means of a lift. The smoking-room is arranged on the Kemble-street and Drury-lane frontages. It is well-lighted and has cross ventilation. The reading-room is approached from two main corridors, and has central area, which is accessible to lodgers. This room is also well lighted from sides and roof and has cross ventilation. The amount of accommodation provided in the dining, reading, and smoking rooms is shown in the following table, and similar information with regard to Carrington House has, for the purposes of comparison, been included also.

Rooms.	Total area.		Area per lodger.	
	Kemble-street House.	Carrington House.	Kemble-street House.	Carrington House.
Dining-room	sq. ft. 4,827*	sq. ft. 6,067*	sq. ft. 6.91	sq. ft. 8.4
Reading-room.....	2,722	3,057	3.89	3.80
Smoking-room	1,904	2,031	2.72	2.53
Total	9,453	11,155	13.52	13.87

*Inclusive of area around hot plate.

"The lavatories, bathrooms, washhouse with drying chamber, shops for shoemaker and barber, and crockery stores, larder, and linen-store are all placed in suitable positions in the basement. Two principal staircases are provided leading to the dormitories, and an emergency staircase with exit to Drury-lane, so that it will be practically impossible for all means of exit to be blocked in case of fire. Each cubicle is about 4 ft. 10 in. wide and about 7 ft. 4 in. long, and is provided with a window, ample means of through ventilation being thus secured. The cubicle corridors are 4 ft. 6 in. wide. Two cubicles on each floor will be occupied by the resident male porters.

"As the Council is aware, the charge for accommodation at Parker-street House and Carrington House is 6d. per cubicle per night, but, in order to make the new house self-supporting, we regret that it will be necessary to make some variation in the charges. We understand that during the past year the Rowton House Company has also raised the charge from 6d. to 7d. in the case of lodgers who take a cubicle for one night only, while the old rate of 6d. still holds good for lodgers taking a weekly ticket. It appears to us desirable that a similar course should be adopted with regard to Kemble-street House rather than that the charge should be increased to 6d. per night for each person and the estimate of receipts and outgoings, as submitted by the Finance Committee, has accordingly been prepared on that basis. We have forwarded to the Finance Committee an estimate of 50,920, in respect of the cost of the building, and have included therein, in addition to the amount of the lowest tender, a sum of 3,920, in respect of the supply and fixing of the necessary apparatus for lighting and ventilation and other extra work, as well as expenses in connexion with the preparation of bills of quantities, lithography, printing, professional charges, and digging of trial holes. The provision of furniture will form the subject of a further estimate at a later date. We recommend—

"(a) That the estimate (No. 4,253) of 50,920, submitted by the Finance Committee be approved, and that expenditures not exceeding that amount be sanctioned in respect of the erection of the proposed lodging-house at the corner of Kemble-street and Drury-lane, to be known as Kemble-street House.

"(b) That the tender of Mr. H. L. Holloway, amounting to 49,100, for the erection of Kemble-street House be accepted; that the solicitor do prepare, and obtain the execution of, a contract to give effect to the tender; and that the seal of the Council be affixed to the contract when ready."

Dr. Cooper moved that the recommendation be referred back to the Committee. The lodging-house would not cater for the poorest class of workers near the Strand, who most required accommodation. These people had previously been paying only 4d. and 5d. a night, and they could not afford to pay the new charges. He doubted whether the house would be a success.

Mr. Jephson seconded the amendment.

Mr. Burns, M.P., said that the "dossers" of London were yearly increasing, and deprecated any attempt to increase their number by providing them with accommodation. The aggregation of large numbers of celibate vagrants in one spot was not desirable. He was strongly against big lodging-houses. The Council had gone too far already in that direction, and they were finding that their Carrington House in Deptford was not paying.

After some further discussion, the amendment was rejected.

The recommendation was adopted, and Mr. Holloway's tender for the erection of the house was accepted.

Shelters over the Public Way.—The Building Act Committee reported as follows, the recommendations being agreed to:—

"We have before us at the present time several applications for permission to erect glass and iron shelters over public ways. The number of such applications received during the year is considerable, and we feel that it would be much to the public advantage if the Council would indicate the line of policy which it desires to follow with regard to them, so as to save applicants the trouble and expense of making applica-

tions which the Council might feel bound to refuse. We do not think that any objection can be taken to this course, provided that it is at the same time made perfectly clear that the Council reserves to itself the right to deal with any application as it deems fit. The Council has, in dealing with the question in the past, jealously guarded the public interests, and has not allowed shelters except where it has been shown that they are for the public benefit. The applications for shelters at places of public resort which have been dealt with by the Council between January 1, 1899, and July, 1904, are as follows:—

	Consents.	Refusals.	Total.
Theatres and music-halls ..	36	3	41
Public halls	15	5	20
Hotels	21	22	43
Restaurants	10	13	23
	84	43	127

"The few applications made with respect to flats, offices, and club buildings have been refused, and in the cases of business premises and private residences only six have been granted. It is, we think, an absolute necessity to afford some protection from inclement weather to the persons frequenting places of public resort, and in the large number of cases where the Council has refused permission for a shelter to be erected some special reason has existed for its action. For example, the position proposed for any such shelter, its mode or mode of construction was unsatisfactory, or the amount of projection over the footway was too great. In all applications sanctioned in recent years the Council has refused to allow a shelter to be erected by pillars or lamp-posts, and has insisted upon the shelter being supported on cantilevers. In several cases where the design was of an objectionable character the Council has required it to be removed. We think, however, that in future the Council should in all cases insist upon the design of the shelter being artistic and in harmony with the architecture of the building. The desirability of the Council insisting upon the shelter being erected in accordance with definite principles to guide applicants and to secure general uniformity has been emphasised by the recent action of the Council with regard to the proposed shelter at Lyons' Temperance Cafe. We recommend—

"That it be referred to the General Purposes Committee to bring up an addition to the order of reference to the Building Act Committee, to provide that—

"(a) That the Council, when considering any application for permission to erect a shelter over the public way, will bear in mind that the Council, while reserving to itself in all cases the right to deal in such manner as it may think fit with any such application, is not disposed to sanction the erection of any such shelter which does not comply with the undermentioned conditions:—

"(a) That the building to which the shelter is to be attached be either a theatre, music-hall, or public hall, with seating accommodation for at least 150 persons, or a restaurant or hotel, with seating or sleeping accommodation for at least 200 persons.

"(b) That the street in which the shelter is proposed to be erected be at least 40 ft. in width if used for vehicular traffic, and at least 20 ft. in width if used for foot traffic only.

"(c) That the design of the shelter be to the satisfaction of the Council.

"(d) That the shelter be supported on cantilevers; that there be no obstruction to the public way; that no part of the shelter or of the supports thereof be at a less height than 8 ft. 6 in. above the pavement level or at a less distance from the outer edge of the kerb than 18 in.; and that no advertisement, sign, lettering, or device other than the name of the premises be placed over or upon or affixed to the shelter.

Rules as to Theatres.—On the recommendation of the Theatres and Music-halls Committee, the following rule was added to the rules to be observed by the licensees of premises licensed by the Council:—

"Whenever it is desired to make use of any portable or temporary steam-boiler on or about the stage, for scenic effects or otherwise, not less than twenty-one days' notice must be given to the Clerk of the Council, and the fittings and arrangements in connexion with the boiler must be inspected and passed by the Council's officers before the boiler is used.

"All boilers, pipes, radiators, etc., used for heating purposes must be equipped and maintained in accordance with the Council's regulations, copies of which may be obtained on application to the Clerk of the Council. Supply tanks must be covered and protected from frost, and the pipes and radiators must be protected where necessary by properly secured guards.

"The owner of each boiler, whether for hot water or steam, must always be prepared to exhibit to the Council's officers a certificate, dated within the previous twelve months, from some recognised insurance company or qualified firm of engineers, showing that the boiler is in condition to safely carry the pressure to which the safety valve is loaded."

A City Improvement.—The Improvements Committee recommended, and it was agreed, that the estimate of 2,000, submitted by the Finance Committee be approved; that a contribution be made on the usual conditions of half the net cost of the widening of Old Broad-street at London-wall, proposed to be undertaken by the City Corporation.

Houses of Historic Interest.—Upon the recommendation of the Local Government and Records Committee, it was agreed to affix a memorial tablet at No. 23, Suffolk-street, W., where Richard Cobden lived. The Committee reported that the Duke of Bedford had fixed tablets at his own expense at the following houses on his estate:—65, Russell-square (Sir Thomas Lawrence); 11, Bedford-street (Henry Cavendish); 6, Bloomsbury-square (Isaac D'Israeli); 28 and 29, Bloomsbury-square (Lord Mansfield); 43, King-street, Covent-garden (Admiral Lord Orford); 27, Southampton-street, Covent-garden (David Garrick).

The Council adjourned at seven o'clock.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Wandsworth.—A building on the south-west of West-hill, Wandsworth, at the corner of Ringford-road (Messrs. Palgrave and Co. Mr. R. Le Butt).—Consent.

Hampstead.—Additions to All Souls' Church, Loudon-road, Hampstead (Messrs. Nichol and Corlette for the Rev. G. F. Terry).—Consent.

Clapham.—Eight houses, with bay-window on the east side of Park-hill, Clapham, northward of "Lyndhurst" (Mr. H. J. Capell, Mr. A. Peacock).—Refused.

Lewisham.—Houses with bay-windows on north side of Belmont-hill, Lee, westward, "Moray House" (Messrs. H. and G. Taylor).—Refused.

Woolwich.—A projecting one-story shop building, to abut upon the south side of Cordite-street and west side of Basildon-rd, Plumstead (Mr. J. O. Cook for Mr. A. Beard).—Refused.

Width of Way.

Southwark, West.—A two-story building, a site abutting upon King's Head-yard, White Hart-yard, Southwark, with external walls at less than the prescribed distance from the respective centres of the roadways of the streets (Messrs. Barlow and Roberts).—Consent.

Width of Way and Line of Frontage.

Peckham.—The rebuilding of the "Nun's Head" public-house, Nunhead-rd, Peckham, abutting also upon Scylla-road, May's-place (Mr. J. Hamilton for the London Brewery Company, Ltd.).—Refused.

Width of Way and Space at Rear.

Hampstead.—Three shops, with dwell-houses over, on the north side of West Hill-lane, Hampstead, westward of Finchley-rd, with a forecourt boundary at less than the prescribed distance from the centre of roadway of West End-lane (Mr. R. L. Peck for Mr. E. J. Cave).—Consent.

Width of Way and Construction.

Limchase.—A wood and iron addition to a building on the west side of Kidney-street, Narrow-street, Limchase (Mr. E. Gregg Pintes's Patent Lighting Company).—Consent.

Formation of Streets, etc.

Kensington, South.—That an order be issued to Messrs. T. Holloway and J. Douglas, sanctioning the formation or laying out of a street for carriage traffic to lead out of east side of Church-street Kensington, and in connexion therewith the erection of buildings.—Consent.

Hammersmith.—That an order be issued by Mr. A. Young sanctioning the formation of a new street for carriage traffic to lead from Ducane-road to Old Oak Common-lane, Hammersmith, and in connexion therewith the widening of a portion of Old Common-lane (for the Housing Committee of the Council).—Consent.

Lewisham.—A deviation from the plans sanctioned in 1899, for the formation or laying out of new streets on the Belmont estate, Belmont-hill, Lee, so far as relates to alteration in the formation of Caterham-rd (Mr. W. P. Neal for Messrs. H. and Taylor).—Consent.

Lewisham.—That the application of Messrs. Eastman Brothers for an extension of the period within which a new street for carriage traffic to lead from Dartmouth-road to Sydenham Hill-road, Lewisham, was required to be clearly defined throughout by posts and gates or otherwise as the Council might permit and thrown open to the public as a highway be granted.—Consent.

Space at Rear.

Hammersmith.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the erection of a one-story building at the rear of No. 66, Ilfley-road, Hammersmith, to abut upon Adre-road (Mr. C. Butterill for Mr. Hanks).—Consent.

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of five buildings, with a stable at rear, on the north side of Marischal-rd, High-road, Lee (Messrs. D. Smith, Son, & Oakley for Earl St. Germans).—Consent.

Means of Escape from the Top of Buildings.

Strand.—Means of escape in case of fire proposed to be provided in pursuance of

on 63 of the Act, from the fifth (top) and sixth stories of Nos. 1 and 11, Cockspur-st., and Nos. 18 and 19, Pall Mall East. The upper surfaces of the floors of the two stories are above 60 ft. from the street level for the persons dwelling or employed therein (Mr. H. Tanner, jun.).—Consent.

ENTRANCE GATEWAY TO ST. DAVID'S CHURCH, PADDINGTON.

The gateway, the gift of Mr. H. Powell-Cotton, has been recently erected in memory of the late Canon Edwards of Llandaff. It is built of Bath stone (fluated). A ribbed iron roof, terminating in a hood, covers the passage for a short space behind the arch, which is like a lych-gate. An old high wall

at one side of the forecourt has been pulled down, and new wrought-iron railings, gates, and lamps erected, the main object being to give greater importance to the church entrance, as the church itself stands back from the road, at the end of a long passage.

The work has been carried out by Mr. J. Casé, of Hampton Wick. The architect is Mr. John P. Seddon.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The first meeting of the Architectural Association Discussion Section, being a joint meeting with the Camera and Cycling Club, took place at 18, Tufton-street, on Wednesday,

the 19th inst., when Mr. G. H. Smith read a paper upon Canterbury Cathedral.

Commencing with the erection of the first church, he traced the gradual development of the building until the present day. His description was illustrated by a series of drawings, which materially assisted those present in understanding the various points touched upon. Among those emphasised were the similarity of the crypt to that of St. Peter's at Rome, the occurrence of disastrous fires at various intervals in the history of the building, destroying, among other parts, Conrad's "Glorious Choir," injury at the hands of vandals as exemplified by the introduction of panelling in the choir and Renaissance stalls, together with the demolition of St. Andrew's



ENTRANCE GATEWAY, ST DAVID'S (WELSH) CHURCH, PADDINGTON. J.P. SEDDON ARCHT.

Tower owing to its not harmonising with that dedicated to St. Anselm, and the narrow escape from the sacrilegious hands of Wat Tyler's mob. The cost of the south window in St. Anselm's Chapel was also mentioned, as showing the small sum expended in carrying out the work in 1336 compared with the cost of similar work to-day. In concluding, Mr. Smith referred to the large number of tragic occurrences which had taken place in the building, the murder of Archbishop Beckett paramount amongst them, and marking, as it did, an epoch in the history of the development of this cathedral, owing to the pilgrimages which set in and the consequent necessity of dealing with great crowds.

Mr. J. D. Crace, in opening the discussion, pointed out in regard to the crypt at Canterbury being based upon that of St. Peter's at Rome, that this was generally admitted to be in its turn copied from the Church of Constantine at Jerusalem. In the course of his remarks, he noted the fact of extra-mural burial, which was strictly adhered to until the death of Lanfranc. Continuing, he regretted that no view of the doorway leading from the north-west transept into the cloisters had been shown upon the screen, as such would have indicated that the present door had been cut into a previous one of a different style, which doorway in its turn replaced a still earlier example; he added that the cathedral was full of examples where new work had been either grafted on to or replaced work in an earlier style, and suggested this as an opportunity for camera work, which would prove of greater value in such instances than sketching. He wondered if Mr. Smith could inform the meeting if any remains existed in the so-called lavatory as showing its original use. A point he thought of interest to present-day architects was that a large part of the original monastic water supply—as shown in the drawings now in Clare College Library—is still in use to-day. Concluding, he said he was struck by the similarity of the capital of one of the crypt columns shown on the screen to that of the Towers of the Winds at Athens.

Mr. H. H. Statham, who spoke briefly, said that the cathedral was interesting from the point of view that it was a building which

afforded so many opportunities for the study of the gradual change from one style to the next in proper sequence. He also noted the marked French feeling running through the earlier portions of the building. In concluding, he expressed his great pleasure in being present that evening to see so fine a collection of slides.

The Chairman (Mr. H. Gregory Collins), in his remarks, regretted that he had only a slight acquaintance with the building. One of the points he noted when going over the cathedral was the great similarity in the work of William de Sens and William the Englishman. The Cathedral appealed to him as belonging to a class of building which stimulated the imagination, recalling the stirring events which went to make history in bygone times.

Mr. A. H. Belcher offered the suggestion that the *Builder* should start a new series of views of the cathedrals from fresh points of view.

Mr. Louis Ambler, in voicing the thanks of the meeting to Mr. Smith and the members of the Camera and Cycling Club for the trouble they had taken, called to mind the sketches, etc., of the cathedrals published in the *Builder* some years ago, and regretted that those of Canterbury were not on view that evening, for, no matter how excellent slides might be, they had not the same architectural and individual charm such as sketches possessed.

Mr. G. H. Smith, in replying, said that his paper was intended more as a description of the slides than aught else. In answer to a query, he described the frescoes under the Chapel of St. Anselm, a somewhat amusing point being that the artist, evidently desiring to be thorough in his work, and wishing to portray a man stricken dumb (Zachariah), had painted him without a mouth. In conclusion, Mr. Smith gave in detail the cost of the window before alluded to, and pointed out the relatively high cost of the metal as contrasted to the stone and glass work.

PROPOSED CANCER HOSPITAL, DUNDEE.—A new hospital for cancer patients is shortly to be erected in Dundee. Plans for the work have been prepared by Mr. James Findlay, architect.

Illustrations.

MONUMENT TO ALFRED DE MUSSET, PARIS.

THE sculptural monument to Alfred de Musset, here illustrated, was presented to the city of Paris by M. Osiris, a wealthy donor, who, as our readers may remember, had been an artistic benefactor to Paris in other important matters. He gave the commission for the monument to M. Mercié, the sculptor, some years ago.

The work was exhibited at the Salon of 1887, under the title "La Nuit de Malherbe," the heading of a well-known poem by de Musset. The sculptor represents the poet seated at a table, an attitude expressive of melancholy and sadness; the lyre, which he was wont to carry about with him, is lying at his feet. The figure behind, seen in profile, represents the poet's Muse, endeavouring to rouse his hopes again, in the hope that she will be once more her companion:—

"Poète, prends ton luth; c'est moi, ton immortelle.
Qui t'ai vu cette nuit triste et silencieux,
Et qui, comme un oiseau que sa couvée appelle,
Pour pleurer avec toi descends du haut des cieux."

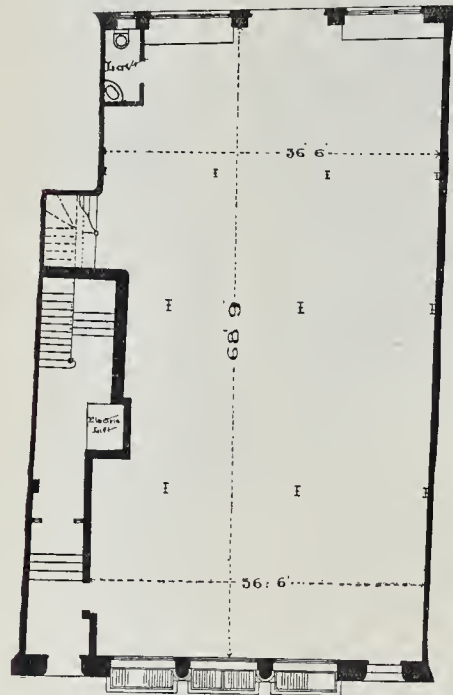
Partons, nous sommes seules; l'univers est à nous.
The monument itself is still in the Musée des Beaux-Arts at Autenil, but is to be erected in Paris, in the first instance, in a planted space in front of the Théâtre Français. As this space is rather restricted, it is probable that ultimately it will be placed in a position, against the wall of the theatre, at the angle of the colonnade where the Rue Richelieu meets the Place du Théâtre Français.

Those who are familiar with the spirit of Alfred de Musset's poetry, its combination of melancholy with a spiritual refinement and passion, will recognise how remarkably Mercié has expressed this spirit in his sculpture.

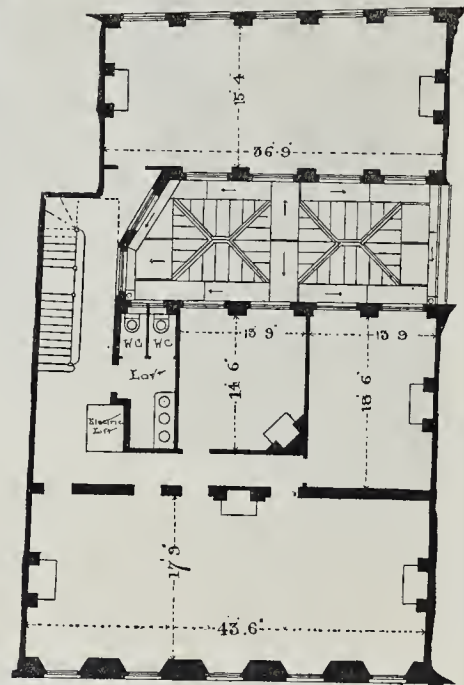
ST. JOHN'S CATHEDRAL, UMTATA, SOUTH AFRICA.

Some six years ago the work of designing the proposed new cathedral for the Diocese of Umtata was commenced.

Ground Plan.



First Floor Plan.



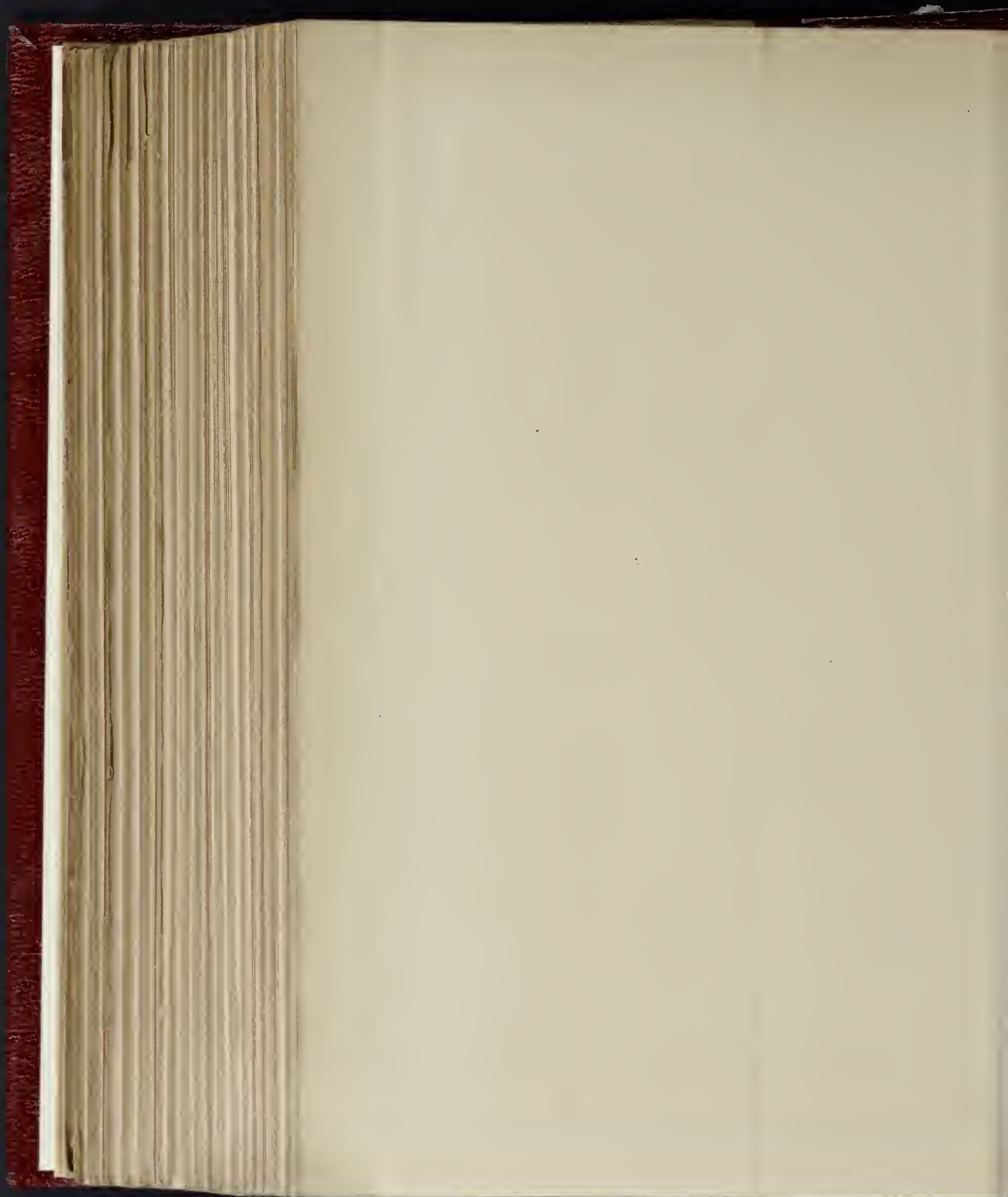
Scale of 0 to 40 Feet

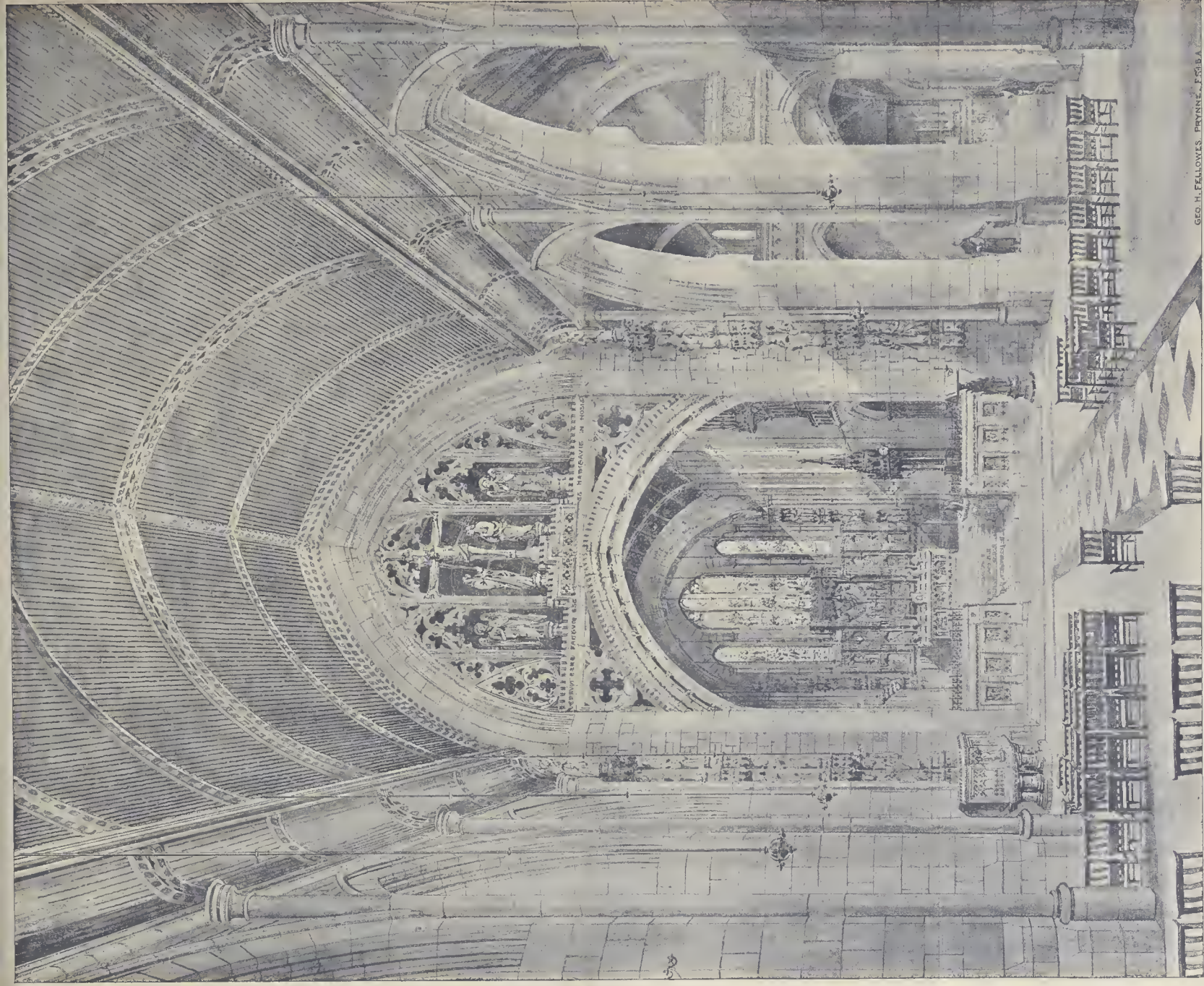
Warehouse Offices, 20 and 21, Queenhithe. Plans.



IN PHOTOGRAPHIC ART, 4 & 5 EAST HADDON STREET, LONDON, W. 1.

MONUMENT TO ALFRED DE MUSSET. PARIS. M. MERCIÉ, SCULPTOR.

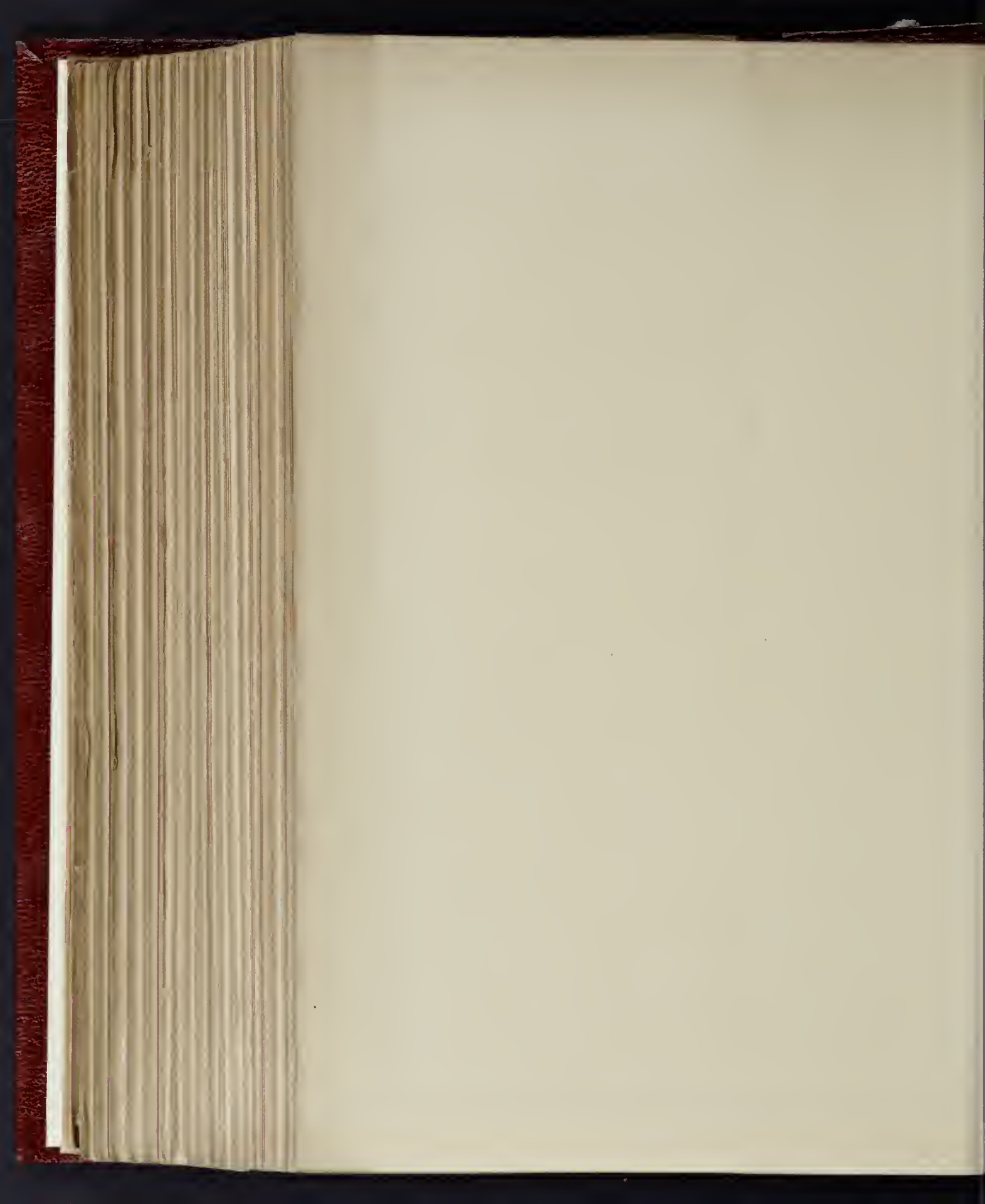




1/16 PHOTO-DUPRAQUE 4 C. 1/16 4 1/2 EAST AND NG STREET, PETER LANE, E.C.

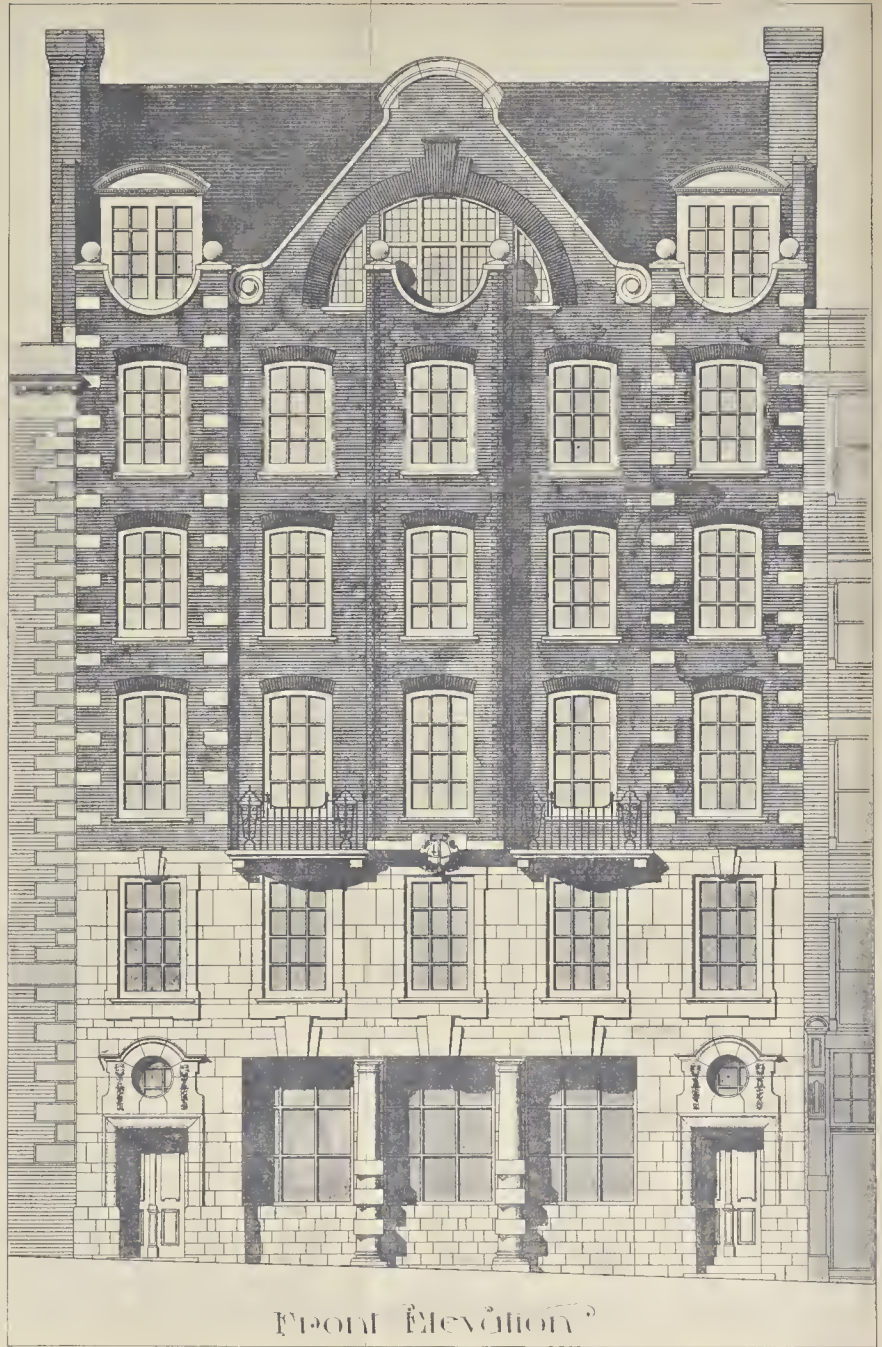
GEO. H. FELLOWES, PRYNNER, F.R.S.B.A.

INTERIOR DESIGN FOR NEW CATHEDRAL, ST JOHN'S, UMTATA, SOUTH AFRICA. MR G H FELLOWES PRYNNER, F.R.I.B.A., ARCHITECT

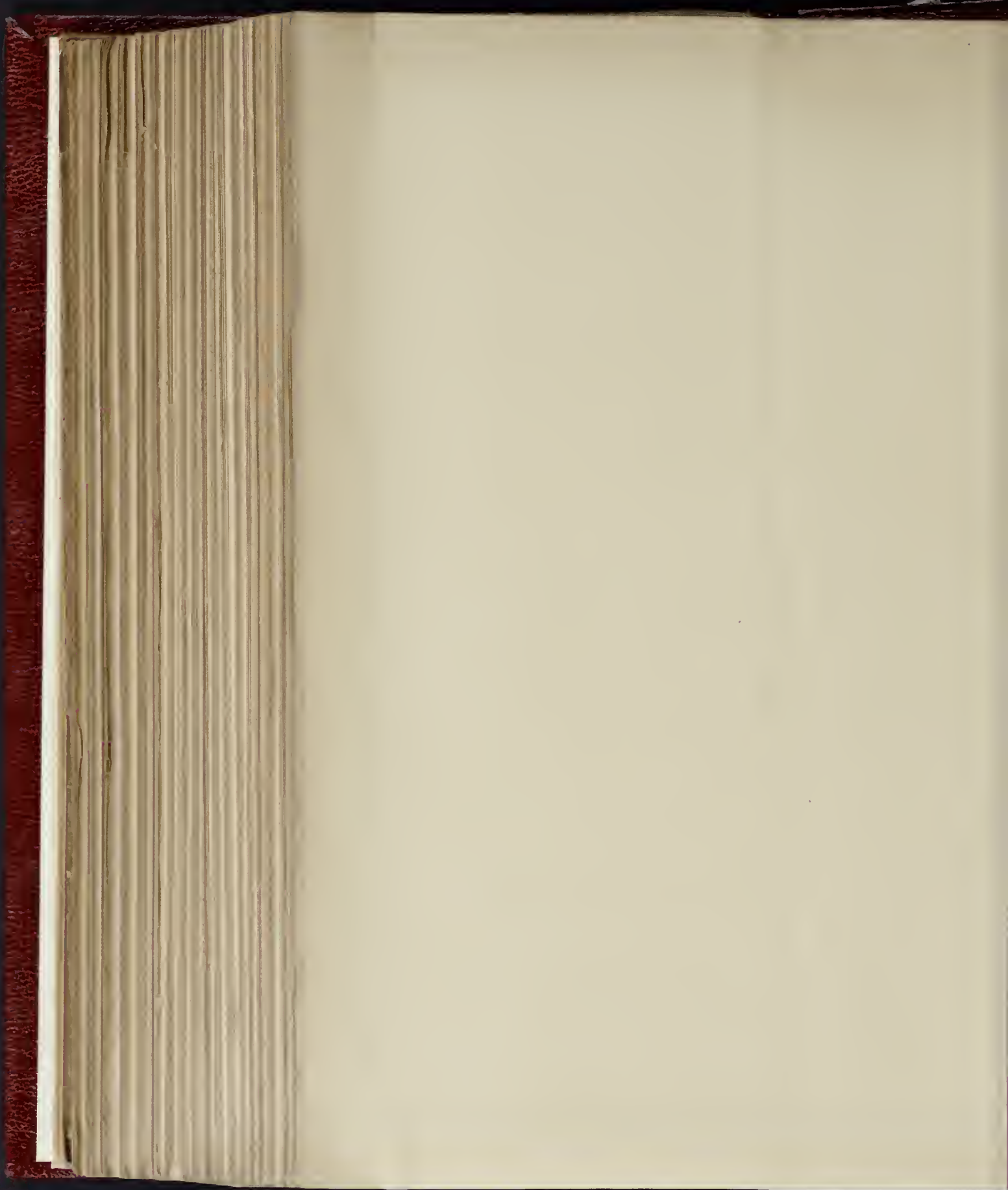


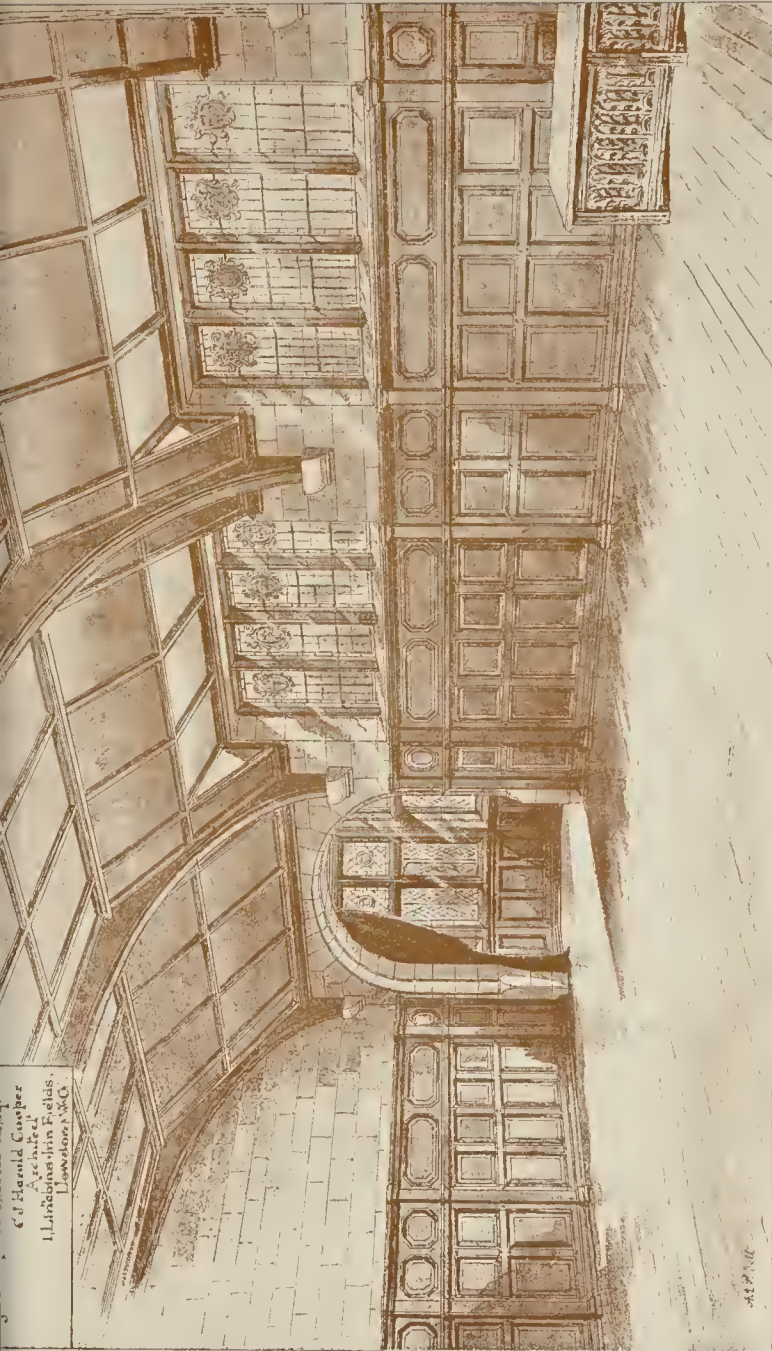


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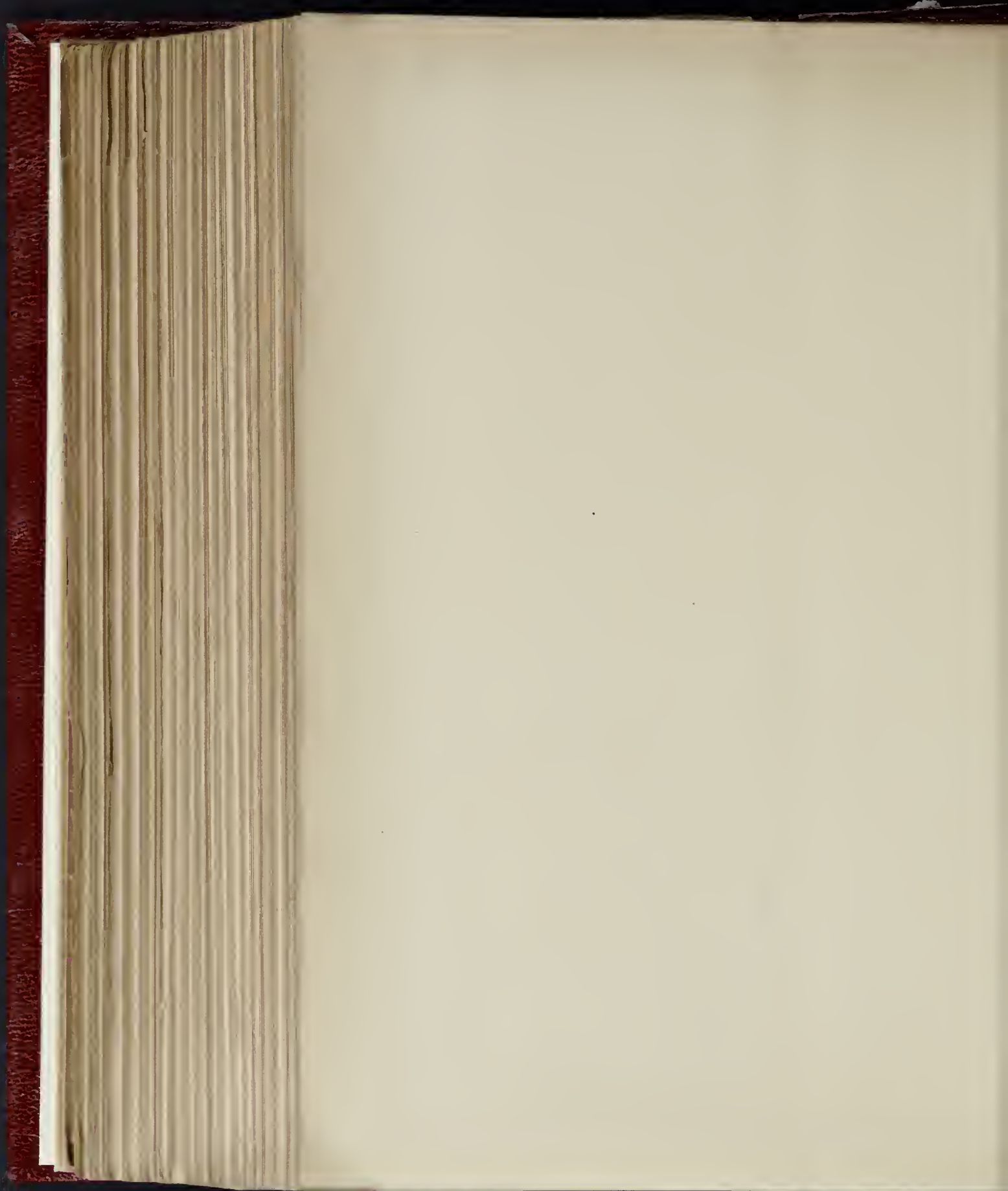


By Mr. J. H. Sturges, 15 Stratton St. W. for Mr. A. J. Johnson Esq. © Harold Cooper Architect & J. L. Hancock Ltd. Fields N.C.



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11, Lincoln's Inn Fields
London, W.C.



John, Kaffraria, South Africa, was placed the hands of Mr. Geo. H. Fellowes Pryne by top Key.

Following to the death of the Bishop, considerable work was caused in commencing the work, the building has now been taken up by the late Bishop, although funds will only allow the western portion being put in hand at present.

The new cathedral when finished will be like a large parish church, accommodating some 1,500 people. The plan shows a uniform church, with a nave 147 ft. in length, 36 ft. in width, divided into seven bays, chancel is 67 ft. long by 30 ft. wide. The north and south transepts form chapels accommodating 189 and 146 people respectively. The east and west chapels are the vestries and organ chamber, the latter being over the clergy house, and speaking into the south chapel and east. The chapter house is in the crypt of the sanctuary.

The plan was unfortunately sent to us too late for illustration.

DESIGN FOR A CRESCENT.

The treatment of a crescent road forms an interesting subject for architectural study. This was suggested by Nash's method of laying Regent's Quadrant (illustrated in the *Builder* of January 2 in the present year), a colonnade of which ceased to exist in 1850. The ground floor of the buildings on either side of the curve of the crescent shows an arcade supporting a colonnade above, the height of two stories, the facade being divided into three blocks intermediate radial roads, bridged across to breaking the main horizontal lines of the facade, and to preserve the continuity of the terraces. It was thought that to get best effect from the curved plan the horizontal lines were better kept unbroken as far as possible. The open central space of the crescent is treated as an architectural garden with water surfaces to reflect the buildings and terraces, the monumental column emphasising the centre of the composition. The material used was Portland stone, including the pediment with an "eye" in the crown of the latter, and with plate glass, for lighting a hall below.

F. R. HIGGINS.

HOUSE OFFICES, Nos. 20 AND 21, QUEENHITHE.

The ground floor and basement of this building are used for a show-room and warehouse, the ground floor carrying heavy pieces of machinery. The upper part, entered by a separate entrance, is set off for offices. The building is built of fire-resisting materials throughout. The front elevation has a Portico base up to the sills of the second windows, above which are red brick facings and Portland stone dressings. The building is heated throughout with hot water, and hot air is laid on to the lavatories. The building is supplied with an electric lift to all floors. Among the greatest difficulties to be overcome in the construction were the foundations, as the building is close to the river, a great deal of work had to be contended with. Beams were 7 ft. wide and 5 ft. deep, strengthened with three strands of wrought-iron chain cable in the concrete, were placed under the foundations. The building has been finished in a little time, but no settlement has occurred yet. The general contractors were Messrs. Grover and the heating work was done by Messrs. Crittall and Co., the steel construction by Messrs. G. Aston and Son, The B. and S. Gate Co. supplied and erected the electric lift. The work was erected under the supervision of the architect, Mr. F. E. Williams.

INTERIORS, PALACE GATE AND STRATTON STREET.

Two pages represent interiors designed by Mr. C. J. Harold Cooper in the Palace Gate and two rooms in a house in Stratton Street.

At WEST HOATHLY, SUSSEX—Memorial-stones of the new Sunday school which is being erected in connexion with a Countess of Huntingdon's Chapel recently laid. The building will accommodate 150 children. The architect for the school is Mr. Hooper.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—The first members' meeting was held on the 17th inst., in the Society's rooms, 13, Harrington-street, Mr. Alfred Culshaw, F.R.I.B.A., presiding. A paper was read by Mr. G. H. Morton on "Modern Decoration." In the course of his remarks, the lecturer pointed out that modern decoration was not confined to one particular style, but had many phases, and included at least three main characteristics—first, that based on the styles of the XVIIIth century, under the names of "Queen Anne," "Georgian," and "Adam's"; secondly, that of the so-called "Modern English" school; and thirdly, the "Early Victorian" or naturalistic. Mr. Morton argued that so long as the XVIIIth century furniture was so eagerly sought after, so long would the decoration of that period be required; and he further pointed out the increasing tendency to adopt contemporary French decoration. As regarded "Modern English" design, the lecturer said that it had so frequently been carried to excess, and had in many cases developed such eccentricities, as to make it conspicuous even to vulgar eyes—so much so as to cause a reaction that had brought about a revival of its opposite in the realistic representation of flowers and other objects peculiar to the decoration of about fifty years ago, and not inaptly named "Early Victorian." The lecturer referred at some length to the importance of colour in decoration, remarking that colour was not only an aesthetic gratification but a physical necessity, and should be studied scientifically. The excess of one brilliant colour, especially red, was injurious to the eyes; and an overpowering quantity of white was also undesirable, because it gave the retina no rest. In conclusion, the lecturer again referred to "Modern English" design and its infinite superiority over the so-called "Early Victorian," probably the worst period of English decoration. "Modern English," Mr. Morton said, "was original, quaint, and picturesque; it took into account the capabilities and nature of the materials it employed; it was not extravagant, but suited to the requirements of most of us, and if kept within proper limits should prove most suitable to the present day, and be the distinguishing mark of modern decoration."

COMPETITIONS.

TOWN HALL AND MUNICIPAL BUILDINGS, PRETORIA.—A young Glasgow architect, Mr. John Ralston, has been selected to carry out the erection of the new Town Hall and Municipal Buildings for Pretoria. Mr. Ralston was trained in the office of Mr. Crawford, in Dumbarton, and of Mr. Cullen, in Hamilton; but he was for a number of years a student and latterly an assistant in the Architectural Department of the Glasgow Technical College.—*Glasgow Herald*.

Books.

Michael Angelo. By LORD RONALD SUTHERLAND GOWER. London: Bell & Sons, 1903.

To do anything like justice to such a man as Michael Angelo, in all his versatility as sculptor, painter, architect, and poet, in a book of 131 pages (including a defective index) must, on the face of it, be an utter impossibility. But this, apparently, is what Messrs. Bell commissioned the author to do. In any case, to put it plainly, there is enough in the style and manner of the book before us to raise doubts of Lord Ronald's ability for such a work, however planned.

Since the publication of John Addington Symonds's "Life of Michael Angelo," there could be little excuse for any inaccuracies as to the artist's personal history, and to do the author of the book under review every justice, this part of his task he has done well enough. But from the lips of a practical sculptor, as he tells us he is, and a friend of Watts, the painter, as he appears to be, we have a right to expect something more. In fact, we look for evidence of insight into the reasons for the master's success, as well as a just appreciation of, and intelligent sympathy with, his eccentricities to a degree not given to the ordinary layman. We are, therefore, heartily thankful for the quotation from a letter of Watts to Lord Ronald, which the latter prints by way of preface, and which constitutes the only bit of

interesting criticism in the book. The letter is charmingly written, but too long for quotation here; in it Watts gives it as his opinion that Michael Angelo was a better painter than sculptor. He cannot resist commenting on the ill-proportioned extremities in the David and others of the later sculptures. This, an eccentricity which many besides Watts have considered a fault, is, however, not so apparent in the early as in the late work of Michael Angelo. And it may be noted that his drawings and his clay studies fall naturally enough into two groups or divisions—those which are drawings or models done from the life, and those which are studies made directly for a large work in painting or sculpture. The former are nearly always delicate, refined, truthful; the latter perhaps more vigorous, but infinitely more exaggerated in pose and in detail. Certain considerations relative to the master's attitude of mind may, in some measure, account for this noticeable difference. He shows far greater sympathy for the male than for the female nude. The subtle transition from the round to the square, which is the great charm of the male form, was evidently the characteristic which he mostly insisted on, and which, when exaggerated, leads to great dignity and significance in the mass and "skyline" of a statue. To a student working with this in his mind, the extremities of the figure afford the most interesting examples of this ever-changing line, and the danger of over-emphasising its phases is one which every student is told to guard against, and it certainly is the fact that Michael Angelo only gave way to it in his later life.

The publishers have allowed the book before us to be disfigured by an advertisement for a picture-dealer, introduced in so misleading a manner as to appear like a subsidiary note to the volume. This is hardly creditable to Messrs. Bell's judgment and taste.

Haddon Hall: An Illustrated Account of the Fabric and its History. London: Sherratt & Hughes, 1904.

It is very seldom that an essay of 147 pages, designed to cover the history and antiquities of an old, notorious, and romantic habitation, can be justly described as comprehensive, interesting, and thorough. Mr. Cheetham has, however, written a book of which this can be said. The author, too, evidently loves his subject, but this love of his cannot altogether atone for the somewhat halting diction and an almost total lack of style, which disfigure part of the writing. The preface is exceedingly modest, and claims for the book little more than the position of a *guide* to Haddon Hall. The work, however, is in most respects admirable, and worthy of a larger and more pretentious volume; and ought, guide or no guide, to be printed on better paper, and, above all things, to contain an index.

Haddon Hall is so beautiful an example of an old English house, and so agreeably planned and situated, that it is matter for astonishment that its present cultivated owner, the Duke of Rutland, finds it possible to leave it uninhabited. Yet there it is—gardens, terraces, dutifully tended; its window-panes glistening with delightful old glass; its rooms well-lined with decent wainscot; but never a puff of smoke from aught but the custodian's chimney gladdens the eye of the traveller along the valley. Family life still centres round the hearths of Penshurst and Hever, and why not of Haddon? Rich in historic association, Haddon bears the traces of almost every style of English domestic building from the Norman days to the more peaceable XVIIth century. Curiously enough, however, the owners of Haddon were never allowed to make it a regular castle, and it is a credit to its lords, therefore, that it survived the lawless and irresponsible behaviour of the English nobility during the reigns of Henry VI, and his successor.

Mr. Cheetham's work is thoroughly well illustrated with photographic views of the house and its surroundings, and contains a set of very well executed plans. If the publishers are wise, they will make this volume the first of a thoroughly comprehensive series of monographs on the older and finer English houses; but they should spend a little more money and trouble on the "set up" of such books, which would then, we think, command a satisfactory sale.

European and Japanese Gardens: Papers Read Before the American Institute of Architects. Philadelphia, 1902.

A book without an index is, in one respect at least, like a servant without a character,

for it sets up an attitude of mind in the possessor which, on the detection of the least fault, will prompt him to discard it for ever. If these papers by eminent hands were worth collecting and editing at all, they were surely worth indexing when printed. As a matter of fact, these particular contributions are peculiarly good, and put to shame many an essay read before the more distinguished architectural societies of England.

The paper on Japanese Gardens (by Mr. K. Honda) is perhaps the most attractive and, in many respects, the most important to the modern architect, because Japanese gardens are beginning to find favour in the South of England, and prove to be perfectly capable, within certain limits, of adaptation to English scenery and to English architecture. The writer has just lately visited such a garden near Salisbury, where a Japanese gardener came down from London, examined the site, settled his design, made a drawing, and was away within two hours of his arrival. In due course came plants from Japan and directions from London, whereby the local gardeners were enabled, without the least trouble or misunderstanding, to produce a most charming and successful effect entirely on Japanese lines. As may be seen by reference to a short paper at the end of the volume before us, experiments in Japanese gardening conducted in California have proved in the highest degree successful. The appropriate plants, shrubs, and trees are, of course, at present very expensive, but now that we know that many of them can be grown with comparative ease in England, it will soon be possible to purchase seedlings from English specimens, instead of importing from Japan.

Historically, the series of papers before us emphasise the fact that English gardeners alone seem to have been able to design well without water effects. The French, like the Italians—their masters—could only deal formally with water. The Japanese are the great masters of informal water treatment.

The plates which ornament and enhance the value of the book are all of them excellent, but are printed, as is the text, on the worst possible leaved paper—a material which it is high time for all good publishers to discard.

The Principles of Architectural Perspective.

By G. A. T. MIDDLETON, A.R.I.B.A. London: B. T. Batsford.

This is a small book, prepared "chiefly for the use of students"; and containing, in addition to general principles, chapters on Isometric drawing and on the preparation of finished perspectives.

As far as explaining the manner of working out a perspective this is a very useful book, and has the merit of brevity and of not confusing the student with examples showing an immense complication of construction lines, by which we believe many beginners are alarmed at the outset of their study, and conceive of perspective as a science of great and abstruse difficulty; whereas in fact the principle of it can be very simply stated, and once grasped, its application to any special subject to be drawn is only a matter of practice combined with care and attention.

We do not know however that here, any more than in most other instruction books on perspective that we have encountered, we find what we should call an ideally clear setting forth of the theory of perspective at starting—of what the science actually is and on what method it proceeds. The author employs in the preface the illustration, which is a very good though not a new one, of the lines of a building being supposed to be traced on a pane of glass between the eye and the object, as representing the projection of a solid upon a picture-plane; but what we want to see in a perspective book is a brief and clear definition, for the beginner, of the mental process and the geometric principle on which a projection of a solid in lines on a flat surface is carried out; keeping clearly before the reader's mind that this process is the converse of the imagined projection of the image of the solid object on an interposed pane of glass. Mr. Middleton, in his explanation of the vanishing points, comes a little nearer to an explanation of the "why" of the thing than we generally find in books on perspective; but still we do not find that clear and rounded statement of the theory of perspective which we think ought to precede all diagrams of construction. The student should be told clearly what he is aiming at before encountering any details as to the method of putting the

theory into operation; and this we cannot remember to have found in any instruction book on perspective. The student is instructed to work on the lines of certain diagrams and certain results will follow; but he is too much left to deduce the theory from the examples.

The chapter on Isometric drawing shows, on page 65, one very practical use to which this form of perspective drawing may be put, in rendering a plan of a building intelligible to those who do not understand it as a flat geometrical representation; (the editor of this journal, indeed, made that very use of it to explain the meaning of plan, in a diagram in "Architecture for General Readers"). The reduced illustrations from finished perspectives by some accomplished draughtsmen are a very useful addition to the book. In the chapter on "Finished Perspective Drawing" there seems to be a mistake, by implication, in regard to the reproduction of drawings: after observing that drawings for reproducing must be in black ink, the author says—"where reproduction is not the object, there is much more freedom of choice, and many prefer to use brown ink," etc.; as if this would not do for reproduction; whereas, in fact, brown ink reproduces just as easily as black.

TRADE CATALOGUES.

MESSRS. YALE AND TOWNE have sent us a small catalogue of locks and builders' hardware. In addition to a great variety of "Yale" locks and latches, the catalogue includes mortise-locks and latches of more ordinary type; a special feature is made of the furniture for upright mortise-locks, many of the sets being very well designed with oval plates to receive both the knobs and the escutcheons. Padlocks, bolts of various types, and other kinds of builders' hardware are also shown. The catalogue is admirably illustrated, and the descriptions are clear and concise.

The Eclipse Copper Company, of York, send us a small catalogue containing descriptions and illustrations of their "Siamese" circulating water-boilers for restaurants, etc. These are such marvels of economy and utility (if we may believe the high-flown descriptions given by the makers) that we are at a loss to understand why any other apparatus is ever used for boiling water. Twopennyworth of gas, we are told, will boil sufficient water for 900 pints of tea, "after boiler has once been warmed up." There is no danger, no necessity for a fire-pipe, no visible steam, no smell, no noise, no trouble, and the apparatus is not a geyser. The materials are all of the best—"solid copper, brass, or German silver" (no "compound" or alloyed metal used by us). What, pray, is brass? And what is German silver? In the absence of sections it is impossible to understand clearly the construction of the "Siamese" apparatus, but we take it to be approximately as follows:—It consists of two cylinders, under one of which the gas-jets are placed; the cylinders are connected by a large pipe near the top and by a small pipe near the bottom, so that the water circulates through the two cylinders; the water-service is connected to one of the cylinders, and the dual arrangement allows an ordinary long-lever ball-cock to be fixed, so that the water is maintained at one uniform level; the taps have long outlets or nozzles to prevent the exit of steam. Certainly the apparatus has some interesting and useful features.

Messrs. E. H. Shorland and Brother, of Manchester, have sent us their catalogue of warming and ventilating appliances. The first place is given to the various types of their well-known "warm-air ventilating Manchester grate with improved projecting back." Some of the designs are a great improvement on the original, glazed bricks and faience being introduced with good effect, and copper canopies being in other designs substituted for the older form of iron canopy. The ventilation section of the catalogue has been extended, and includes inlet and outlet ventilators of different designs and types. The third section contains complete particulars of the "Manchester" stoves, which have been largely used in hospitals and schools, and supply warmed fresh air in addition to radiant heat. The stoves are made with open or closed fires and with ascending or descending flues, and may be obtained with a simple iron casing or with tiled panels in an iron framework or entirely encased with faience. The catalogue is fully priced and illustrated, and the three sections are printed on paper of different colours to facilitate reference.

Messrs. Hodkin and Jones, of Sheffield, send us a circular describing their "corrugated bar system" as applied to fire-resisting design. The system in question is virtually an approach to concrete-steel construction (thin steel bars of corrugated section are on edge in concrete, displacing ordinary girders or joists). Throughout the circular comparisons are made with joists of the section, and the superiority of the corrugated bar system is demonstrated by illustration, records of tests. In our opinion, the advantage to be expected from the employment of it in the manner described are greater than following the use of I-sections and less than those offered by true concrete-steel.

Messrs. Hall and Pickles, of Manchester, send us their "stock" catalogue of iron steel bars, plates, and girders, an excellently printed, well-bound book of convenient dimensions. Details are given of almost all commercial forms of iron and steel in general use by architects and builders, and we draw particular attention to the bright-rolled steel bars catalogued, these bars being round, square, flat, and hexagonal cross-section suitable for use as shafting, for making and for other purposes. Lists are also included of rolled steel joists and broad-flange beams kept in stock, the information supplemented by tables showing the safe load on the same sections used as beams and columns. While not doubting the accuracy of the figures in the tables, we must point out that the values have to be taken either on trust, and in the case of beams it is not clear whether calculations are based on the assumption that the ends are fixed or merely supported. The book concludes with tables of compound girders, cast-iron columns, and number of tables giving the weights of sections mentioned in the preceding pages.

Messrs. Henry Hope and Sons (Birmingham) send us a very finely printed and illustrated catalogue of their metal casements and wrought-steel sashes. The firm have now produced three new ranges of sections—Nos. 1, 2, and 3, each of which can be supplied either upwards hung at side or top, or inwards at side or bottom. The carefully selected sections of these windows seem to be a thing that could be wished in regard to proper design. The appearance of the finished window is illustrated in each case by a photograph from the actual work. The catalogue also includes hopper casements and cheeks; wrought-iron and gun-metal hinges, bolts, and stays, wrought-steel sashes, gears, etc. Photographs of a good number of buildings which have been fitted with sashes by this firm are given, and serve to show the appearance of the sashes is quite in harmony with buildings of specially artistic character, as indeed plain but solid and well-executed work generally is. The decoratively wrought-iron and gun-metal casement sashes are of good design; but in other respects the work shown is entirely plain, and it is in the preface that highly elaborated ornamental detail has been avoided, not because we think it undesirable, "but because we are convinced that such work must be so produced for its position if it is to be tolerated. We wish all manufacturing firms had sound and sensible ideas on the subject, what is often mis-called "ornament."

FIRE DETECTOR.—We had an opportunity last week of inspecting a fire detector, invented by Mr. Leslie Walker. The principles on which it works are the expansion of mercury heated and the fact that mercury is a conductor of electricity and so can be used to close an electric-bell circuit. These principles have already been applied in many fire detectors, but Mr. Walker's is the first one we have seen that gives a certain amount of a sudden rise of temperature of 3 degs. Fahr. This is effected by means of a compensating chamber to which the detector has access by means of a capillary tube. We were shown that merely setting a thermometer on fire in the middle of a large room about 25 ft. high was sufficient to produce a gradual warming of the ceiling works, the effect on it until the temperature rose to about 170 degs. Fahr. In our opinion the device is thoroughly practical, and is a most improvement on the ordinary types of fire detectors. The official title of the company is "The Leslie Walker Instrument Fire Detector and Fire Indicator Company, Ltd."

Correspondence.

SANITARY OFFICIALISM.

"If I have been 'too moderate' in the you did me the honour to publish, it because I did not feel strongly on its matter.

country where precedent and law are terms, inquiry and comparison form a more effective instrument moving injustice and inaugurating reban declamation or invective. Yet it is admitted that the grievances of the through the official administration of the relating to public health are strong tempta-hot-blooded reprisals. When officials the protection of a body corporate in a way that to a common-sense *ultra vires*, if not *ultra licitum*, the opened to petty tyranny by useless re and in forcing to absurdity the of the law. In opposing such the inll has to combat forces which his mone maintain. He has to employ counsel, use of the most expensive character, to is case (as I know to my cost), and is very little less costly than defeat. not get a tenth of your costs allowed. again, a body corporate is an intan- ing. A common definition notifies that no physical part to kick, and no al part to damn. The London County By-laws, 1903, are witness. Whoever them up took care that other officiate should not in this respect find safety m. Section 5 carefully defines "as including 'any body of persons corporate or unincorporate.'" Yet this is not admitted. Judge Addison of the Bermondsey Borough Council radiating liability for the act of its If it "heads I win, tails you lose."

of the other sections give opportunity and requisitions in the hands of un- dard fussy officials, and the committees to time, and often no inclination, to appeals. The London County Councils are overworked, and are forced more to leave the administration of city affairs to its 5,000 officials. It is erience that, having advised proceed- cials force them to an issue with that which I can find no other word but e to describe, notwithstanding the evidence brought against them, I should suppose they had a heavy personal in the result. This was not so under Metropolitan Board of Works and ury administration. The pettiness of their proceedings is shown by such a the Bermondsey Borough Council v. ported *Builder*, p. 598 ante), and dis- by Mr. Baggeally as "preposterous," her described as "the essence of munici- orism." Many people are too timid not the means to fight a corporation, suffer the injustice inflicted in its Combination is the only method pos- sible strong enough to contest every or strained proceeding by officials. multiplicity of detail on drain plans on by some officials is quite uneces- is not only plans by amateurs like rants Craunham that are rejected. Archi- d builders have their plans sent back, e for schemes not acceptable, but for detail absolutely unnecessary on a eord, but sometimes with assertions by le plumber raised to the dignity of a inspector that they are not to scale in ects. Borough engineer, medical sanitary inspector all sit upon our schemes, and weeks of delay ensue age to foundations accrues from want ege. I admit that fifty years ago the n was not "text" on drainage, e the general practitioner to-day the on does not apply. I do not admit ment that this particularity makes work profession. For a poor man who has paid 250l. for a house, and has, by notice, to lay out 40l. on up-to-date to have to pay for an elaborate to last straw of the burden.

to rich client it does not matter so at it is often an unwarranted burden her class. "A detailed description in (section 4) of the intended mode of in- joining, and fixing any such anhole gully, pipe, bath, water-closet s, sink, urinal, lavatory basin or s or trap," if given in advance, can- ys be adhered to when carrying out Yet before one ventures to depart work, or a risk of summons in- and, unfortunately, all upstarts the fairness or common-sense of Mr. y. *Trade Owners' Protection Association* meet with general support. Mean-

while the advantage of ventilating the subject in a journal like the *Builder* is very considerable.

Apologising for the length of this letter, E. W. HUDSON, F.S.I.

October 22.

COURT OF COMMON COUNCIL.

The Lord Mayor presided over the fortnightly meeting of the Court of Common Council held at the Guildhall on Thursday in last week.

Liver Embankment.—The Streets Committee submitted the duplicate licence of the Thames Conservancy to the construction of an embankment on the land purchased at Hornchurch in accordance with the arrangement agreed to on July 23.

Congress on Drainage, etc.—The Streets Committee further reported that they had appointed their chairman, Mr. A. C. Morton, as one of the representatives of the Corporation at the First International Congress of Drainage and House Sanitation to be held in Paris on November 1.

Carriage-way, Lower Thames-street.—A report was read from the Improvements Committee submitting a tender from Messrs. Mowlem and Co. at 5,380l., for repairing the carriage-way and footways of that portion of Lower Thames-street between Fish Street-hill and Monument-street included in the contract with Mr. Woodhouse for constructing a subway in that street, and recommending that the engineer be authorised to have the work carried out by Messrs. Mowlem and Co. The recommendation was agreed to.

Streets.—It was resolved that no steps be taken to effect any improvement in connexion with Nos. 4 and 6, Copiah-avenue, now being pulled down, or in respect of Nos. 171, 172, and 173, Fenchurch-street. A return was submitted of buildings extending over streets, courts, and alleys in the City of London, and the Improvements Committee stated that when opportunity occurred by the pulling down of the premises the question of dealing with the archways would be duly considered.

Tramways.—A letter was read from the London County Council asking the Corporation to agree to a proposal for connecting up the present tramway termini in Blackfriars-road and Westminster Bridge-road by the construction of tramways between those points, *via* Blackfriars Bridge, Victoria Embankment, and Westminster Bridge. The County Council proposes in a Bill next session to ask from Parliament powers to carry this out. Mr. A. H. Barber, the Streets Committee, with instructions to confer with the Bridge House Estates Committee. He urged that the question was important in view of the probable recommendations of the Royal Commission on London Locomotion. Mr. W. Cooper seconded the motion and it was carried.

The City Surveyor.—The Officers and Clerks Committee submitted a report on the retirement of Mr. Andrew Murray from the office of City Surveyor, and also with reference to the suggestion to amalgamate the office with that of the City Engineer. The Committee recommended:—(1) That the offices of City Surveyor and Engineer should be amalgamated; (2) that a City Surveyor be appointed; (3) that the salary of the office be 1,000l. per annum, rising at the discretion of the Court, to a maximum of 1,500l. per annum; (4) that the age of candidates shall not exceed fifty years on the day of election; (5) that the position be advertised; (6) that it be referred back to this Committee to receive applications and select five candidates for final election by the Court. The recommendations were adopted, and the Court adjourned after transacting other business.

WESTMINSTER CITY COUNCIL.

The fortnightly meeting of this Council was held on Thursday last week at the City Hall, Charing Cross-road, W.C.

The Finance Committee submitted a long report on the subject of the increase in the expenditure of the Council over the expenditure of the authorities which it superseded. From this report it appeared that whereas the outlay on the work under the control of the Works Department was 76,453l. in the year 1889-1900 (when the City Council came into being), the estimates for 1904-5 amounted to 106,406l.—an increase of 29,953l. On the other hand the capital expenditure on new paving or repaving works which is not included in the foregoing figures was 28,720l. in 1889-1900. During 1902-3 it had fallen to 17,708l. In the next twelve months it had risen to 26,462l., but the provision in the estimates for 1904-5 was only 18,000l. The Vice-Chairman of the Committee made a long statement on the matter. The Mayor (Councillor Emden) observed that the report was a very long one, and suggested

that the discussion of the matter be postponed until the next sitting. This was agreed to.

Picturesque Westminster.—The offer of the Mayor to present to the Council the blocks used in the production of his portfolio of sketches, "Picturesque Westminster," was accepted, and thanks tendered to Mr. Emden.

China Gun Trophy.—On the recommendation of the General Purposes Committee it was agreed to place the China Gun Trophy, allotted to the Council by the military authorities, upon the triangular refuge in St. St. Martin's-place, opposite the City Hall.

The same Committee submitted a list of by-laws, made under the Public Health (London) Act, 1891, section 94, with regard to houses let in lodgings. The seal of the Council was affixed.

Street Improvements.—The Improvements Committee submitted a report containing a number of recommendations with regard to street improvements. Among those agreed to was one offering the sum of 105l. for certain land and required for straightening the street frontage of Portsmouth-street, Lincoln's-inn-fields.

Spread of Smallpox by Vagrants.—On the recommendation of the Public Health Committee, the Chairman of the Committee and the Medical Officer of Health were appointed delegates to the Conference on this subject, convened by the London County Council for November 10 next.

Street Lighting.—The Works Committee reported that the Engineer of the London County Council had made inquiries as to the system of public lighting to be adopted in the new streets leading into Aldwych and Kingsway. The Council agreed to comply with the suggestion contained in the letter that the streets (which are from 40 ft. to 50 ft. wide) should be lit by incandescence gas lamps of 700 candle-power on 20-ft. columns. The City Engineer was instructed to report on the number of lamps required.

Baths and Washhouse.—On the recommendation of the Baths and Washhouses Committee it was agreed to carry out certain structural alterations at the Buckingham Palace-road Baths, at an estimated cost of 127l.

OBITUARY.

PROFESSOR KERR.—We regret to announce the death, on October 21, in his eighty-second year, of Professor Robert Kerr, of Berwick House, No. 139, Oxford-street, W., and of No. 31, Cathcart-road, Kensington, S.W. Professor Kerr was born on January 17, 1823, at Aberdeen, where he had his education. He was elected a Fellow of the Royal Institute of British Architects in 1857, and has served as member of the Council; he was one of the original founders of the Architectural Association, of which he was the first president, in 1847-8, on the establishment of the Association at Lion's-inn, W.C. He was for many years Professor of the Arts of Construction at King's College, London, and a Fellow of the College; and retained the title as Emeritus Professor after his resignation of the office. Forty-two years ago Professor Kerr was appointed District Surveyor for St. James's, Westminster, and he continued to discharge the duties of that office until the autumn of 1902, when, by reason of the failure of his health, the London County Council nominated Mr. H. N. Kerr to act as deputy district-surveyor, on November 9, 1902. At their meeting on July 19 last the Council resolved, in view of Professor Kerr's declining powers and of his physical inability to tender a formal letter of resignation written by his own hand, that his appointment as District Surveyor should terminate as on November 9 of the current year. Of Professor Kerr's architectural works and designs we have published illustrations, with plans of the following:—Portion of his designs for a range of buildings, on the Whitehall and Horse Guards site, to receive the War and Foreign offices, with residences for the two Secretaries of State, as submitted by him in the competition held in 1857 (September 26, 1857); the National Provident Institution, in Gracechurch-street, at the corner of Eastcheap, E.C. (January 3, 1853); "Dunsdale," at Westerham, Kent, for Mr. Joseph Kitchen (June 20, 1863, the doorway); his designs, for which he won the second premium, for a National Museum of Natural History, at South Kensington (June 25, 1864); Ascot Heath House, Berkshire (December 19, 1868); and Ford House, at Lingfield, Surrey (December 25, 1869). He was the architect of Bearwood, in Berkshire, for the late Mr. Walter, of the *Times*. Amongst his literary labours connected with the study and practice of his profession we may instance the remarkable little book published in 1846, under the title, "Newspaper Discourses on the Fine Art Architecture"; the volumes

entitled "The English Gentleman's Country House," first published in 1865; "The Consulting Architect," published by Belknap, in 1894; and "Town Houses." He brought out an edition of "Fergusson's History of Modern Architecture," of which a third edition appeared in 1891, and he contributed the chapters upon "Plan," and "Thoroughfares" to "The Principles and Practice of Modern House Construction," written by various specialists, and edited by Mr. G. Lister Sutcliffe, 1900. Professor Kerr was the author of many pamphlets, essays, etc., upon professional subjects; we may cite his paper, read in 1866 to the Institute, upon the problem of providing dwellings for the poor, which was reported, together with the long discussion thereupon, in our XXIVth volume of that year.

GENERAL BUILDING NEWS.

CHURCH EXTENSION, DORCHESTER.—The memorial-stones were laid recently of the additions that are being made to the Wesleyan church in South-street, and Durngate-street, Dorchester. Mr. R. Curwen, architect, of London, has prepared the plans for the improvements, the cost of which is estimated at about 3,000*l.*

CHURCH, SPIDDAL, GALWAY, IRELAND.—The foundation-stone has just been laid of the new Church of St. Enda, at Spiddal. The style of the new building has been described as Irish Romanesque, and the work of carrying out the design of the architect, Mr. Scott, has been entrusted to Mr. Griffin, builder. The church will be 88 ft. long and 30 ft. wide, having small transepts and a round chancel to the eastern end. In the angle of the north transept will be a square tower 60 ft. high running boldly up with sloping walls to the top. An offset occurs at the bell-chamber stage, which is marked by recessed spaces. The tower is roofed transversely, the points of the gables showing over the parapet. The north transept is roofed in two spans, and has a parapet returned against the tower. The sacristy is situate on the other side of the transept, and is entered by a door from it. The south transept contains a small gallery for the choir, reached by stairs from the outside. The chancel arch will be semi-circular in two orders, the inner one springing from corbels. It will be constructed in limestone, and provision will be made for Celtic carving. The roof will be of open timber, displaying all the constructive timbers and will be covered with Killaloe slates. The ridge covering will be of sandstone. The pillars dividing the transepts from the nave will be of Galway marble. The principal entrance will be through the porch of Irish character near the end of the nave. The doorway will be ornamented with round arches recessed in three orders, and left plain for future carving. The quoins, stones, doors, windows, and arches will be of limestone.

ROMAN CATHOLIC CHURCH, MURROE, IRELAND.—The foundation-stone of the new parochial church at Murroe, Co. Limerick, was laid recently by His Grace the Archbishop of Cashel and Emly, the Rev. Dr. Penneley. The building will be of the Romanesque style, and will consist of a nave, transepts, chancel, and sacristy, underneath which is to be a heating chamber. The total length of the interior is 120 ft. The width of the nave is 36 ft., width of transepts 33 ft. by 25 ft. in depth. The arcade across the transepts consists of three bays of circular-headed arches, supported on columns of polished granite. Two doorways give entrance to the sacristy—one from the transept, and the other from the apse. The position of the altar will be at the junction of the nave and chancel, over which will be an archway. The nave is to be spanned by a barrel vault, with principals resting on well-projecting corbels. The front of the building is pierced by a deeply-recessed doorway, situated in a projecting porch, of chiselled limestone, and carrying a pediment with frieze and weathering. The nave is lighted by eight windows with sunk jambs, and over which circular heads are carried, and the transepts have twelve of the same pattern. The cutstone dressings are of Limerick limestone, while the masonry of the exterior is taken from the Moher quarries. The main portion of the walls behind the face work is built out of the Glenfall quarries. The contractor was Mr. Thomas Williams, of Borrisoleigh, and the architect Mr. Joseph O'Malley, of Limerick. It is estimated that the cost of the work will be about 7,000*l.*

METHODIST CHURCH, SEAHAM HARBOUR.—The foundation-stones of the new United Methodist Free Church and Schools at Seaham Harbour were laid recently. The new church and schools will be erected on the site of the old buildings in Church-street, and will be built by Mr. Arthur Errington, of Metton-le-Hole,

from the plans of Messrs. Wm. and T. R. Milburn, architects, Sunderland. The church will be capable of seating 782 persons, and a choir of fifty-two. The school will accommodate 400 children, divided into fourteen classrooms. There will also be a lecture hall in the rear, together with vestries and conveniences. The contractors' price is 3,500*l.*, and, with heating apparatus and organ, the buildings will cost about 4,700*l.*

St. CYRUS U.F. CHURCH, ABERDEEN.—The new U.F. Church at St. Cyrus, Aberdeen, is built at the junction of the Station-road with the Montrose and Aberdeen highway. The church is seated for about 280, and consists of a nave and two small transepts with an arched recess in the south gable. At one side of the recess is placed the pulpit, and in front is the choir, surrounded by a rail with corner posts finished with a brass rail, and seated with cathedral chairs. The plans were prepared by Mr. Robertson, Newtyle, while two of the office-bearers—Messrs. James Lyall and Andrew Wishart—undertook the duties of clerks of works. The following tradesmen were engaged on the work:—Mason work, William Greig, Lauriston; carpenter and joiner work, and the pulpit, John Rait and Sons, Montrose; plumber work and gas piping, R. and W. Peter, Bervie; slater work, Alexander Ramsay, Johnshaven; plaster work, David Masterton, Forfar; painter work, Alexander Clark and Son, Montrose; heating, James L. Gorden, Montrose; glazier, John H. Douglas, Montrose; gas fittings, James Milne and Co., Edinburgh. It is intended to hang a bell in the tower.

NEW METHODIST CHURCH, KINGSTOWN, IRELAND.—The opening of the new Methodist church, which has been erected in Northumberland-avenue, took place a short time ago. The building has been designed in the Early English style, and is of cut stone, capable of seating 250 persons. It has cost 5,500*l.*, including expenditure on an alteration in the school-house, and the cost of the organ, 500*l.* Messrs. J. and P. Good, Dublin, were the contractors for the building, the architect being Mr. G. F. Beckett.

WESLEYAN CHAPEL, CHESTERTON.—On the 13th inst. a small chapel was opened in Church-street, Old Chesterton. The building is constructed of red brick, has a red-tiled roof, and is in the Queen Anne style. There is seating accommodation for about 200 persons, and light is supplied by incandescent burners. The architect is Mr. W. Wren, of Cambridge; Messrs. Kerridge and Shaw were the builders, and the cost is about 1,100*l.*

SUNDAY SCHOOL AT WHITTINGTON MOOR, DERBYSHIRE.—The United Methodist Free Church Society opened, on the 12th inst., their new Sunday school, off St. John's-road, Whittington Moor. Mr. Willis Glosop, of Chesterfield, is architect, and Mr. J. Stubbs is the contractor.

NEW SCHOOL, WESTEND, SOUTHAMPTON.—A new school has been built and recently opened at Westend. The total cost, including the site, has been about 2,750*l.* The builders were Messrs. H. and W. Haines, Mr. Gutteridge being the architect for the work.

NEW SCHOOL, CAIRNE, N.B.—The opening of the new public school at Shenwell, Cairne, took place a short time ago. Mr. Thompson, of Fife-Keith, architect to the Cairne School Board, designed the building. The work has cost about 800*l.*

LIBRARY, HARTLEPOOL.—The new public library at Hartlepool, for the building of which Mr. Andrew Carnegie granted a sum of 5,000*l.*, was opened on the 12th inst. The new library is of red brick, with carved stone-work, and has been built from the plans of the Borough Engineer, Mr. H. C. Gummack. The entrance is from Milbank-crescent, approached direct from the street into an open porch, on either side of which a space is provided for the storage of cycles. The hall, to which admittance is gained through folding doors, is 18 ft. long, by 13 ft. 6 in. wide, and the lending department is 52 ft. long by 20 ft. wide. Shelving is provided for about 24,000 volumes. On the left of the hall is a ladies' room, with seating accommodation for twenty-four persons. The news-room is on the right of the hall, and is 59 ft. long by 25 ft. wide, with stands for thirty newspapers and tables for thirty-six readers. On the upper floor, which is reached by a staircase from the hall, is the committee-room and reference and record department, which is about the same size as the news-room. A caretaker's residence is also attached. The internal work is of pitch-pine, and the floors of the entrance hall and staircase are laid in mosaic, whilst that of the lending library is in terrazo. The building is lighted throughout by electricity.

BUSINESS PREMISES, LONDON.—At the corner of Beak-street and Regent-street Messrs. Robinson and Cleaver have just opened a

portion of their new premises. The front of the shop and show-rooms is constructed of polished Swedish red granite, with green bases, the height of the granite from the ground being 53 ft. The doorway in Regent-street is under a porchway, 15 ft. wide, paved with white and green Connemara marble cut. Over the doorway, as well as on the floor, there are balconies of wrought-iron. The second and third floors facing Regent-street are of Portland stone, recessed a pediment with carved tympanum, supported by engaged rustic Doric columns surmounted by a stone attic with balustrade in the flanking by two carved lions of Portland over 6 ft. high. The building at the end is circular, and is 90 ft. high, the second and third floors being recessed with columns, while the upper story is a circular tower, which is finished by a dome and flagstaff above a carved frieze. The entrance in Regent-street is a shop, 95 ft. long, and nearly 15 ft. wide, the floor of which is of oak. There is a central hall, with a decorated skylight. All the columns and apartment are of veined alabaster, to that used in the construction of the ways. From it an alabaster and staircase leads to the show-rooms on floor. At the foot of the stairway are five statues in white alabaster of British origin. At the top of the first flight of stairs is a landing which faces a stairway window of three lights, divided by piers. The architects of the new premises are Messrs. Crickmay and Sons.

PUBLIC LIBRARY, LEEDS.—The Lady's opened recently the new branch library in York-road, East Leeds. The building fronts of 100 ft. to York-road. The library portion is entered from that side through an entrance hall and vestibule. The exterior is faced with Accrington bricks, with Morley stone dressings, and the main entrance being surmounted by two carved figures. In the panel of the vestibule windows are carved stone-bearing the names of Chaucer, Shakespeare, Milton, and Macaulay. The lending news-room, and ladies' reading-room are on the ground floor, while a juvenile reading room is provided on the first floor. The exterior is surmounted by a surmounting juvenile entrance and contains an ornamental fan. The floors are of fireproof concrete paved with maple blocks. The entrance is paved with marble mosaic conformed to the design of the Leeds City Arms. The building is heated throughout by hot water low-pressure system and is lighted electrically. Mr. H. Asougou Chapman, of Leeds, is architect, his design and plans having been awarded the first premium in connection with the public competition in which Mr. J. Stokes, of Westminster, acted as judge. The whole scheme has cost over 20,000*l.* The contractors for the various works (which have been carried out under the supervision of the architect and the clerk of works, F. W. McInnes) were as follows:—Mr. Rhodes, bricklayer and mason; Messrs. Dawson, joiners; Messrs. Pickles, slaters; Mr. Geo. Thompson, plumber; Theo. Moore, plasterer; Messrs. Pennington, ironfounders; Messrs. Royal Horsman, painters; Mr. Dixon Powling; Messrs. Wallis and Watson, electricians; Mr. Alfred Whitehead, painter; and Messrs. T. Hirst and Sons, fitters and plumbers.

CONSUMPTION HOSPITAL, LIVERPOOL.—The work of rebuilding the consumption hospital in Mount Pleasant, Liverpool, is finished, and the building will shortly be opened. The old house belonging to the hospital at the corner of Roscoe-street, Mount Pleasant has been overhauled, brought pretty well up to date internally, a new block has been built, which from the corner of Rodney-street, east gable of the old house mentioned above, which is fireproof throughout, lighted with electricity. It is intended for patients and the other for additive purposes. There is accommodation for fifteen males and fifteen females. The patients' department will retain its position in the old block, which has been altered and modernised. On the ground of the main building are a day-room for a day-room and smoke-room for medicinal purposes. All these rooms have a view of the sea. Besides these there are on the ground floor doctors' rooms, lavatories, etc. On the first floor are two dormitories and two rooms leading on to a flat roof, on which a cot may be wheeled in the open air. The nurses' duty-room is placed on the second floor, which contains eight sleeping-rooms, from nearly all of which

communication with the airing flats. Administrative block provides apart-sleeping and otherwise, for seven as well as the servants' room. The are ranged round the building. The structure is of terra-cotta and iron bricks. Messrs. Grayson and Ould architects.

ADDED ADDITION TO WOODBRIDGE HOSPITAL.—Dr. S. Monckton Copeman, Local Government Board Inspector, at the Guildford Rural District Offices, on the 6th inst., to inquire re application by the Guildford, Eng., and Woking Joint Hospital to the Local Government Board for a borrow 3,650*l.* for extension of infectious disease hospital at Woodbridge. Mr. E. L. Lunn, the architect, said proposed additional buildings comprised scarlet fever pavilion, having two each with ten beds, two single-bedded nurses' duty-room, and a sanitary at either end. The addition to a would provide for a new scullery, the first floor three nurses' bedrooms, one over the kitchen. With reference to the existing balance shed was partly converted into a stall for a and the remainder thrown into the room. A van shed would be added at end, so that the stabling would now date two horses, the ambulance, the ring-van, and would give sufficient store and clean the harness. The having suggested an alteration in the of the baths among one or two alterations, the inquiry closed.

WORKS ON THE STANLEY HOSPITAL, LIVERPOOL.—The new operating theatre and outpatient department of this were recently opened by the Countess y. The walls and ceiling of the are finished in Parian cement on a cement ground. The basins and are supplied by Twyford's and Shanks, fitted throughout with knee-action the pavement is terrazzo. The heating on the low-pressure system. The on is by direct inlets and a large shaft, the latter being worked by an fan. The extension to the outpatient department consists of a surgeon's room, two dressing-rooms (male and female) and a theatre for minor operations, adjoining recovery-rooms. The contractor for the extension were Messrs. James and Co., Messrs. Joshua Henshaw being the contractors for the operating theatre. Mr. Alfred Calshaw was the architect.

PROPOSED ALTERATIONS AT THE VICTORIA BIRMINGHAM.—The question of in the accommodation at the Victoria for the magistrates' clerks and the in their department was brought before Watch Committee at their last meeting on the 19th inst. a sub-committee to inquire into the matter made an of the building in company with Messrs. E. H. Webb and F. H. Bell, for the purpose of ascertaining in any additional provision can be made unduly interfering with the architectural character of the interior.

NEW OFFICES, ABERCORN.—The new of the Abercorn District Council were on the 17th inst. The premises, which are erected at a cost of 1,500*l.*, are g to designs of the surveyor, Mr. J. S., and were erected by Messrs. D. W. S. and Co., Newport. The first floor collector and assistant-overseer's clerk's office, and caretaker's apartment bedrooms, and dining-room. A ade station has been erected at the is intended to erect workshops and ouse also. The second story consists er and surveyor's office, with a draw- at the back, and sanitary inspector's a members' retiring-room.

BATHS, LEAMING.—The new baths which eds Corporation have erected in were opened on the 17th inst. The is situated at the junction of Broad- Calverley-lane, and has cost 10,600*l.* it was Mr. J. Lane Fox.

STAINED GLASS AND DECORATION.

NEW, ST. SAVIOUR'S, WALTON-STREET.—A ined-glass window has been put up avioeur's, Walton-street, Sloane-street. ndow consists of five lights, with a tracery above. The centre light Our Lord with the right hand raised g, the left holding the orb. Seated ches in the shafting are four figures Evangelists and the four Doctors of ch. The other lights are fitted with gures of St. George, St. Paul, Isaiah, Augustine of Canterbury. All the

figures stand under canopies of XVth century tabernacle work. The tracery contains emblems of the Evangelists in four of the openings, I.H.C. and X.P.C. in two others, angels holding scrolls in three others, and cherubs in the smaller openings. The work is from the studio of Messrs. Taylor and Clifton, and will be dedicated on the Harvest Festival, October 30.

MEMORIAL WINDOW, BELFAST.—A stained-glass memorial window was recently unveiled in St. Stephen's Free Church, Millfield. The window consists of two lights, separated by a shaft of masonry, and has been designed and executed by Mr. W. E. Roberts.

SANITARY AND ENGINEERING NEWS.

ELECTRIC POWER STATIONS.—The electrical equipment of the large power-house in Lot's-road, Chelsea, belonging to the Underground Electric Railways Company, of London, is now fast approaching completion, and in a few months it will be supplying the power required to work the Metropolitan District Railway. It is the largest power-station in Britain, and it will supply the power for the Great Northern, the Piccadilly and Brompton, the Baker-street and Waterloo, the Charing Cross and Hampstead, and the Edgware and Watford Electric Railways. The electrical design of the station is similar in its main features to that of the Carville power station of the Newcastle Electric Supply Company, and to several power stations in America. The power is transmitted at a pressure of 1,000 volts by three-core lead-covered cables, which are in some cases heavily armoured with galvanised iron wire, to the distributing-stations. There are eight three-phase alternators, each of which is directly coupled to an 8,000 h.p. Westinghouse-Parsons turbine. These machines can be run on an overload of 50 per cent. safely for two hours. It is stated that the "neutral" point of the winding of the armature of each of the alternators will be connected to earth through a resistance so that the current flowing to earth can never be greater than 1,000 amperes. We suppose that this is done as a compromise between safeguarding the lives of the employés and safeguarding the gas and water mains in the neighbourhood. The currents flowing between the neutral points of three-phase systems are often of very considerable magnitude, and the damage done by the electrolytic corrosion produced by alternating currents is sometimes serious. When the station is working, therefore, it will be important to record the magnitudes of these currents. The boilers, sixty-four of which are already in position, are arranged on two floors, and the stoking will all be done automatically. From the engineering point of view the situation is ideal, as the station is bounded on one side by Chelsea Creek, and on the other by the Thames. The coal can thus be brought by barges, making the company independent of the railways, and the large quantity of water required for the surface condensers can be got from the Thames. The diameter of the pipe required for the circulating water is 66 in. The coal handling, stoking, and ash removing plant is almost entirely automatic, and as 800 tons of coal daily will be required when the station is fully loaded, the coal bunkers have been made sufficiently large to store 15,000 tons.

FOREIGN.

FRANCE.—The Conseil Supérieur des Beaux-Arts has furnished the Government with a list of artists from whom to select a successor to the late Joseph Blanc as Professor of Drawing at the Ecole des Beaux-Arts. The choice, it is expected, will fall on M. Raphaël Collin.—The new buildings of the Ecole Spéciale d'Architecture, No. 254, Boulevard Raspail, have just been opened.—Five architects, MM. Bossard, Coutan, Camille Lefèvre, Gabriel Ferraud, and Henri Ebrard, have been admitted to take part in the competition for the Chenavard Prize for 1904.5.—The new church intended to replace a place of worship, the ancient church of St. Pierre at Montmartre, has just been opened. The church, which is situated in the Rue des Abbesses, has been entirely built in armoured cement. It is the work of M. Baudot, Inspecteur-Général des Edifices Diocésains, and has been carried out for the sum of 450,000 francs.—An art exhibition is to be opened at Albi on November 6, to remain open till December 4. The special exhibition of the artists of the Gironde will take place during the months of November and December. The Thirteenth International Art Exhibition at Monte Carlo will be held from January to April next year.—M. Lucien Magne, Inspecteur-Général des Monuments Historiques, has been appointed architect to the work at

the church of the Sacré Cœur at Montmartre, as successor to M. Rauline.—The death is announced, at the age of eighty-one, of M. Le Couteur, architect, of Saint L6.

SWITZERLAND.—The new Botanical Museum at Geneva, designed by Hery Juvet, was opened last month.—The Orphanage at Lucerne, which was partially burned in May, 1903, has been rebuilt and restored under the direction of Herr Müller.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Linolite Company have removed their offices from 47 to 25, Victoria-street, Westminster.

BUILDING BY-LAWS.—The Chislebury Rural Council again refused, on the 21st inst., to pass the plans of a model workman's cottage at Barcombe, drawn by Mr. Justice Cranham. At the instance of the Local Government Board he had made certain additions to the original plans, but the Council contends that they are still unintelligible, and do not conform to the by-laws. The Plans Committee is considering the advisability of asking the Local Government Board to modify the by-laws so as to make them suitable for rural districts.

YORKSHIRE BUILDING TRADE EMPLOYERS' FEDERATION.—The monthly meeting of the Council of the Yorkshire Federation of Building Trade Employers was held at Hull on the 20th inst. Mr. E. Good, Hull, the President, occupied the chair, and, after the business had been disposed of, the Mayor of Hull (Alderman Jarman), at the request of Councillor Forsdike, Sheffield, placed round the neck of the President a gold chain, which henceforth is to form the badge of that office. Each link of the chain is a gift from a past president, while the medallion has been presented by the President himself. The Mayor congratulated the Federation upon the high position it had attained, and he appealed to the members to miss no opportunity of relieving distress among the skilled operatives in the building trades, suggesting that it would be a good thing if labour could be more widely distributed by giving men, say, four days' work a week where they could not be given six.

EFFECT OF SILVER STAIN ON GLASS.—In reference to the designs for stained glass illustrated in our issue of the 8th inst., Mr. Horace Wooller, the author of the design, writes that the words at the close of our description as to experiments with silver stain and its application in the production of white and coloured glasses "did not exactly represent his meaning; the words should rather have been silver stain and its application to various white and coloured glasses. He adds:—"The experiments were in connexion with the varying intensity of colour that could be produced by varying the amount of yellow stain on a soft white glass such as 'double-rolled.' Also with the possibilities of staining flashed blue and flint, or ruby glass, portions of which have been exposed to hydrofluoric acid."

GREY FRIARS, LINCOLN.—Messrs. W. Watkins and Son, of Lincoln, have been appointed architects to carry out, at a cost of about 2,000*l.*, a restoration of Grey Friars, on behalf of the Corporation. The building consists of a large oblong structure, situated on the west side of Broad-gate. The lower story, now lying at some depth below the surface of the ground, has a groined vault supported by eight octagonal columns, with plain bases and capitals. A curious covered staircase, of wood, gives access from without to the upper story, which has a mullioned window at the east end, and a coved ceiling of wood, worked in herring-bone fashion; a small room at the west end serves for the school library. The windows along the south side are interspaced with the wall buttresses. The Franciscan Friars were established in Broad-gate by William de Benningworth in the first half of the XIIIth century. The Friary chapel—being the building we mention—was conveyed to the Corporation on December 13, 1574, by Robert Monson, Chief Justice of Common Pleas, and until the erection of the new buildings in Lindum-terrace, designed by Mr. W. Watkins, was used for purposes of the Free Grammar School, founded in 1553. In 1833 the Charity Commissioners made a scheme for administering the endowments on behalf of the Lincoln Grammar School and the Middle School, whereupon the Middle School, for day scholars only, was established at Grey Friars.

PROPOSED MUNICIPAL BUILDINGS, GUILDFORD.—At the meeting of the Urban Council held on the 12th inst. the Surveyor (Mr. Wooldridge) submitted a written report upon the plans which he had prepared for the erection of municipal buildings, which are to be of red brick, with white stone facings. This report

stated that the amount of 5,000, is fixed as the cost of the building. On the ground floor accommodation is provided for the clerk, surveyor, and overseers. On the first floor are the sanitary inspector's office, committee-room, waiting-room, cloak-room, and Council-room, the last-named being placed at the rear of the building to obviate any inconvenience which might be caused by the railway. Provision has also been made for utilising the space in the roof, which is of considerable extent, and can be made available for many purposes. The details of the accommodation are as follows:—Basement floor, 7 ft. 6 in. high—store-room, 21 ft. 6 in. by 17 ft. 9 in.; other rooms, 17 ft. 6 in. by 15 ft., and 16 ft. by 11 ft.; coal cellar, 13 ft. by 8 ft., and store for cycles, etc., approached from outside, 11 ft. by 6 ft. Ground floor, 11 ft. high—entrance hall, 16 ft. by 7 ft. 6 in.; overseer's office, 18 ft. by 13 ft.; clerks' general office, 22 ft. by 18 ft.; clerk's private office, 17 ft. by 16 ft. 9 in.; surveyor's general and drawing office, 24 ft. by 16 ft. 6 in.; surveyor's private office, 17 ft. by 15 ft. 6 in.; sample and store rooms, lavatory, and pay office, the last-named adjoining the surveyor's office, and approached from the store-yard at the rear of the building. First floor—Council chamber, 39 ft. 6 in. by 30 ft. by 12 ft. high; committee-room, 21 ft. by 18 ft. by 10 ft. 6 in. high; sanitary inspector's office, 18 ft. by 18 ft. by 10 ft. 6 in. high; cloak-room, 18 ft. 6 in. by 6 ft. 6 in.; lavatory, etc. The report and plans were approved.

MEMORIAL TO QUEEN VICTORIA, KENSINGTON.—On the 19th inst. Princess Louise unveiled a column which has been erected in the open space in Kensington High-street, opposite St. Mary Abbot's Church, by the inhabitants of Kensington as a memorial to the late Queen. The monument consists of a curved pedestal, 8 ft. 6 in. in height, in fine axed Corrennie granite. Affixed on the principal face is a bronze tablet bearing an inscription. The pedestal, which is surmounted by a bronze wreath of olive leaves, supports a column 22 ft. 9 in. in height, composed of a base, annulet, and cap of white Pentelicus marble, the intermediate shafts being in polished red Corrennie granite. The annulet in the centre of the column has carved on it a portrait bust of the late Queen, and is connected with the column by a band of ornament encircling the words "Victoria, Queen and Empress." The capital is a variation of that of the Ionic order, carved in large angle volutes and surrounded above the necking with a band of acanthus leaves. This cap, which is 3 ft. 3 in. square, is carved out of one block of Greek marble. On the square abacus stands a bronze terminal containing a vase and flame in red polished granite, the flame being gilded. The total height of the memorial is 35 ft. 9 in. above the street refuge on which it stands. Mr. H. L. Florence, architect, designed the monument.

NEW ALTAR, ST. EDMUND'S CHURCH, MILES PLATING, LANCASHIRE.—A new high altar is being erected in this church, and will shortly be unveiled. The whole work, including decorating and oak flooring of the sanctuary, is being executed under the direction of Mr. E. Gunson, of Messrs. Telford, Gunson, and Sons, architects, of Manchester, and will cost about 900l.

THE LAW AS TO COMBINED DRAINAGE.—In a report circulated on Monday, the Public Health Committee of Battersea stated that in June, 1903, a deputation from the several Metropolitan Borough Councils waited upon the President of the Local Government Board and presented a memorial praying that the Government would introduce a Bill to amend the law on the subject of combined drainage. Mr. Long would not, however, make any definite promise with regard to legislation, but promised to give his careful and earnest consideration to the solution of the difficulty. Up to the present no action appeared to have been taken by the Government, and as, in the opinion of the committee, it was important that the matter should be reopened before Parliament reassembled, it had been decided to ask the President of the Local Government Board to receive a further deputation upon the subject, and to ask the several Metropolitan Borough Councils to each appoint three delegates to form, with the London Members of Parliament, such deputation.

DISCOVERY AT PETERBOROUGH CATHEDRAL.—A discovery has been made in the precincts of Peterborough Cathedral. In the passage leading from the cloisters to the old monastic kitchens a number of arches have for many years remained bricked up. One of these was opened this week, and was found to contain a complete window with late Gothic tracery. The window measures 10 ft. 6 in. by 5 ft. 9½ in. The sill of the window is almost on a level with the present path. This, coupled with the fact that the door leading to the old

kitchens, part of which remains intact in the Palace gardens, is much smaller on the outside than on the inside, seems to show that the surface of ground has risen 3 ft. or 4 ft. since the passage was patrolled by monks. There are, it is believed, several similar windows in the adjacent arches, which are at present blocked up.

NORTHAMPTON MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Northampton Master Builders' Association was held at the Grand Hotel, Northampton, recently, the President, Mr. H. W. Hanwell, presiding. The loyal and patriotic toasts having been honoured, Mr. T. Ashdown proposed "The Mayor, Magistrates, and Members of the Corporation," coupled with the names of the Councillor Henry Martin, J.P., Councillor H. Green, Councillor T. L. Wright, Councillor R. Finnegan, and Councillor J. Porteous, all of whom replied. Councillor Henry Green proposed "The Architects," and in so doing said that we had heard a lot about people going from our towns back to the land, but how could they live in. Under the present restrictions the builders could not build houses in the country, which they would be able to let at a moderate rent, so it was no good talking of people going back to the land.—Mr. W. Hull, in response, said that he believed that very shortly we should see a change in the building restrictions in Northampton. They had many builders on the Council, but no architects to look after them. Speaking of the Association, he thought the Builders' Association was one of the best, and one which had carefully looked after their interests. Mr. J. T. Ingman, Mr. W. Shaw, Mr. E. May, and Mr. S. H. Harris also replied, and the last-named touched upon the difficulties placed in the way of builders by the by-laws in many places. It was, as Mr. Hull had said, impossible to build houses in the country for artisans which would pay a fair return for their money. Mr. Harris went on to speak of the present cutting of prices which was made necessary by the depression in trade. He looked forward, however, to the time when a new Government would be in power—not necessarily a Liberal Government—and when the clouds of war had passed, for then we might expect a return of the good times which we had previously enjoyed.—Mr. J. J. Hart proposed "The Northampton Builders' Association." In doing so he said that the Association was one which had for its object the amelioration of the working classes, the protection of the builders, and the good of both. The Association had been in existence for thirty-six years. Mr. F. W. Ains, the secretary, was one of the promoters of the Association, and he had devoted himself entirely to the Association. They owed to him a very deep debt of gratitude for the very flourishing condition of the Association. They had an Association which had a good foundation. It had done a very good work, and so long as it existed the building trade could not help but flourish. In looking round the room he found that with hardly one exception most of the builders present were men who had risen by their own perseverance and energy to the proud positions that they occupied to-day. He coupled with the toast the name of Mr. H. W. Hanwell, the President. Mr. Hanwell, in reply, said the building trade was an important one, and he could endorse the statement that it was for the good of all, particularly for the working classes, that it was flourishing. Speaking of the by-laws as to building in Northampton, the speaker said it did not matter how big the house the architect was asked to build, he could not build one with better sanitary arrangements than those insisted upon by the by-laws of the town for all houses. Mr. Redwood (Luton) proposed "The Town and Trade of Northampton," and Mr. George Wilkinson replied. Mr. W. Higgins proposed "The Visitors," and Mr. S. B. Wilkinson replied. The Chairman proposed "The Wellesborough Builders' Association," and Mr. H. Newton and Mr. T. H. Pound responded. Mr. J. J. Martin submitted the toast of "The President." The toast was received with musical honours, and Mr. Hanwell made a brief response. Mr. W. Heap proposed "The Vice-President," a toast which was also received with musical honours, and Mr. G. W. Souster replied. The Chairman proposed "The Secretary," and Mr. F. J. Ains briefly replied.

SALE OF ARCHITECTURAL AND ARCHAEOLOGICAL WORKS.—Messrs. Sothby, Wilkinson, and Hodge, at their rooms in Wellington-street, Strand, sold by auction, on October 20/25, a large collection of books and manuscripts from various libraries. Among the prices realised were the following:—Ruskin's "Seven Lamps of Architecture," first edition, 2l.; "Architectural Sketches from the Continent," by R. N.

Shaw, 1872, 100 plates, "Album du G. with twenty etchings, and two other 12s.; P. F. Robinson's "Rural Architecture," 1856, ninety-six plates, and T. F. "Exemplars of Tudor Architecture, to Modern Habitations," 1836, 2s.; "for Architectural Ornaments, Canopies, Friezes, Fountains, Clock Cases, etc., seven plates, beautifully engraved, similar collection of forty-three plates in old calf, with the Royal Arms of France on the sides, 25s. 10s.; P. De Lorme "Premier Tome de l'Architecture," in woodcuts (Paris, 1568), 10s.; "Les Antiques de Rome," by A. D. numerous plates, Paris, 1622, 7s. "Architettura," by G. A. Rusconi, in woodcuts, Venetia, 1590, 11s.; "V. Britannicum, or the British Architect," Campbell, two volumes, numerous (1745-17), 10s.; "Plans of Labourers," by J. Wood, thirty plates, 18s. "Transactions of the Kent Architectural Society," from 1858 to 1892, 6l. "Journal of the British Archaeological Association," 1845 to 1887, 3l. 3s.; another 1845 to 1903, with indices, etc., 5l. "Sure Guide to Builders," by B. plates of doors, ceilings, etc., 1729, and "Practical House Carpenter," by W. plates (1799), and four other volumes, 9s. kin's "Elements of Perspective," first 1859, 4s.; "City and Country Building Workmen's Treasury of Design," Langley, with numerous plates (1775), "Select Architecture," by R. Morr fifty plates (1757), 5s.; "Monuments of Moderns, Collection formant une de l'Architecture des différents Peuples les Epoquees," by J. Caillabaut, numerous plates, Paris, 1870, 6s.; "Architecture," a lecture for the A. Crafts Exhibition Society," by W. K. Kilmecost Press, 1893, 15s.; "Reminiscences of Secular and Domestic Architecture," G. G. Scott, "Notes and Sketches of Architecture," translated from Narjoux Peto, 1876, and "Materials of Construction," by W. C. Unwin, 1890, 5s.; "Glossary of Terms used in Grecian, Roman, Italian Gothic Architecture," by J. H. Park, 1,700 woodcuts, three volumes, fifth 1850, 1l. 17s.; "Some Account of Architecture in Spain," by G. E. Str numerous illustrations, second edition 2l. 6s.; "The Churches of London," Godwin and J. Britton, with numerous illustrations after Mackenzie and Billing, and "Handbook to the Cathedrals of England," parts I. and II., with numerous engravings, 1861, 11s.; "Lectures on the Origin and Development of Medieval Architecture," by Sir Gilbert Scott, two volumes, with illustrations, 1879, and "Gothic Architecture," T. Rickman, sixth edition, with numerous additions, by J. H. Parker, numerous illustrations, 1862, 3l. 2s.; "Exemplars of Architecture, Adapted to Modern Buildings," by T. F. Hunt, with plates, 1s. "Examples for Builders, Carpenters, Joiners," with fifty plates, 1857, 1s. "Architectural and Picturesque Illustrations of the Cathedral Churches of France and Wales," numerous plates, 1836; Winkles' "French Cathedrals," numerous plates and plans, 1836, 13s.; "Ecclesiastical Architecture of Ireland, with Essays on the Origin and Uses of the Round Tower," G. Petrie, numerous illustrations, vol. 1 (1845), 1l. 14s.; "Dimensions, Plans, Sections, and Sections of the Parochial Church of Sir Christopher Wren," by John with sixty large plates (1848-9), 5s.; "Elevations, Sections, and Details of Alhambra, from Drawings by Jules with Owen Jones, numerous large and small plates, chiefly in colours, heightened in gold, with a complete translation of Arabic inscriptions, etc. (1842-5), 3l. "The Ancient Architecture of England," J. Carter, with notes by John numerous large and fine plates (1837); Ruskin's "Examples of the Architecture of Venice, Selected and Drawn to Measure the Edifices," India proofs of the large beautiful plates, with descriptions in folio (Oxford, 1837), 18s.; "The Cabinet-maker's Director," a Collection of Useful and Elegant Domestic Household Furniture in Gothic, Chinese, Modern Taste," by T. Chippendale, edition, 160 fine plates (1754), 3l. The given for some of the old standard work extraordinarily low, and would lead us to suppose that the auctioneers had succeeded in collecting the right kind of stuff for such a sale. The idea of a copy of a haberdashery's fine work going for 6s. seems unless we suppose that there were no a present.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned

inments as follows:—Bermondsey, M. Jones as sanitary inspector in the place of W. Williams; Islington, Mr. C. J. Bridal sanitary inspector.

THE SANITARY INSTITUTE.—The King has conferred the title of "Royal" upon this important and valuable institution, which will henceforth be known as "The Royal Sanitary Institute."—At an examination in Practical Science, held in Nottingham on October 21 and 22, 1904, two candidates presented themselves, and of these Mr. James Hall (Manchester), was granted a certifi-

BUILDING AND SURVEYING WORKS, SHEFFIELD.—C. F. Wike, M.Inst.C.E., issued, on the 18th inst., his annual report as Sheffield City Engineer. The expenditure in his department for the year (March, 1903 to March, 1904) was £177,100, as compared with £139,266, in 1897.

Highways cost 245,708*l.*, against 239,915*l.*; sewers 46,545*l.*, against 36,923*l.*; and water works 11,536*l.*, against 11,955*l.*, and was expended on account of the Tramways Committee, in special highway track 25,438*l.*, against 32,602*l.*. In addition, 5*l.* was spent on private street work, in view of the amount spent on reconstruction of defective sewers at the ratepayers' expense. The laying of brick or pipe sewers in place of the old rubble sewers is being carried on as quickly as the amount granted the department will allow, and nearly 10 miles of sewer were converted during the year. The length of carriage ways paved during the year is 37.31 miles, and of footpaths kerbed 13.17 miles, and footpaths paved and asphalted, 18.32 miles; the total paved cost of this work being 180,387*l.*

In the sewerage department, twelve miles of sewers have been completed during the year, which four miles were in connexion with the street works. The total estimated cost of this new sewerage work was 34,566*l.* In streets, twelve miles of sewers have been laid or flushed, at a cost of 2,546*l.*; and on farms have been reported for sending water or steam into the sewers. At the sewage works 6,498,534,000 gallons of sewage were treated, of which quantity 380,000 gallons were treated by bacteriological processes, and the rest by lime precipitation. Over 53,000 tons of sludge have been sent to Kilmhurst. The purification obtained by the lime process has maintained the standard of previous years, but the difficulties are caused by trade wastes, have a tendency to increase, these wastes causing much trouble and expense in treatment. In biological treatment the experimental work of the past years has been continued, with encouraging results, the large settling tank and single-concrete beds constructed two years ago have worked satisfactorily. Schemes have now been prepared for the bacteriological treatment of the whole of the Sheffield sewage works, sections and estimates having been got.

The estimated cost of a scheme, including sixty contact beds of 4 acres each, sixteen storm beds of 1 acre each, with sumps, conduits, roadway, bridge over the Don, etc., is 270,000*l.*, but the Local Government Board inquiry has not yet been completed.

In the architectural department the important works completed, or in course of completion, during the year are the Park baths and library (15,600*l.*), Crofts dwellings. Area 1 (23,000*l.*), Penistone-road destructor (100*l.*), and Queen's-road car-shed extension (50*l.*).

In the building department 2,338 houses shown on plans were approved, an increase of 44 per cent. over the number in 1903. Other buildings sanctioned, 894, including churches, chapels, schools, hotels, shops, salerooms, additions to works, stables, sheds, stores, etc.

During the twelve months the 2,051 new houses were certified for occupation, which number is 328, or 14 per cent. fewer than the average number of new houses certified in each of the preceding five years. The total number of houses in the unincorporated city is believed to be 94,385. For Framways Committee the City Surveyor's department has laid two miles one-furlong of new tram track, and three furlongs of new single track during the twelve months, and in addition there has been a good deal of renewal

SPANISH TRADE MARKS.—The notable example of industrial enterprise which has developed in Spain during the last few years has not unnaturally led native traders and manufacturers to adopt measures to advertise their special class of merchandise, and to new fields of enterprise to meet the fast-growing competition. One of the effects of this movement has been largely to increase the demand for Trade Mark registration, which, however, is not confined to native goods, but is extended to the pilfering of well-known foreign marks, to the disadvantage of foreign trade in Spain.

These applications are in many cases successful, owing to the fact that the legitimate owners have neglected to secure prior protection, either by registering their mark direct in Spain or by having it registered in Berné under the terms of the International Convention. The only means of counteracting this illicit practice, which is prejudicial to British trade, not only in Spain, but in other countries on the Continent, is to effect timely registration of the marks in the countries in which British goods are imported.

Legal.

BRISTOL BUILDING DISPUTE.

The case of *in re* an arbitration between Shepherd and Smart came before the Court of Appeal, composed of the Lord Chancellor, and Lords Justices Stirling and Mathew, on the 25th inst., on the appeal of Mr. J. W. Smart against a judgment of a Divisional Court, consisting of the Lord Chief Justice, and Justices Wills and Kennedy.

Mr. Foote, K.C., and Mr. Weatherley appeared for the appellant; and Mr. Clavell Salter, K.C., and Mr. Macnaughton for the respondent.

Mr. Foote said that this was an application to set aside part of an award. The Divisional Court refused to affirm part of the award, but as to the other part they declined to interfere, and it was with regard to the latter part that Mr. Smart was now appealing. The point raised was a short one, and turned upon the construction of the contract between the parties. It was a building contract, Mr. Shepherd being the builder, and Mr. Smart the owner. The contract related to the alteration of certain premises in Bristol belonging to Mr. Smart. At the conclusion of the work three points of dispute arose. One was as to the amount to be deducted from the builder's account for omissions. The builder had sent in a claim for extras. The architect had examined it and settled it at his prices. He allowed the extras, and made out the certificate for the amount of the omissions at the same prices as the builder had charged for the extras. The amount allowed by the architect for omissions was 150*l.* The builder claimed that that, and the two other disputes, should be referred to arbitration, and although the building owner contended that there was nothing to refer, the matter went to arbitration. The arbitrator reduced the 150*l.* allowed by the architect for omissions to 119*l.*, and that sum of 31*l.* carried with it the whole cost of the arbitration, which lasted three days, and prevented the building owner getting his costs in the Divisional Court. That was the main dispute, and the only real dispute before their lordships. The second dispute arose through the builder contending that there was a contract to give him undisturbed possession of the premises while he did the work, and the arbitrator found such a contract, and gave him 3*l.* damages on that head, but the Divisional Court set that aside, and there was no appeal on that point. The third head of dispute was as to some bits of lead-eistern heads—valued at 2*l.* 10*s.*, and there was a question whether the builder was entitled by custom to take them, but it was not worth while occupying the time of the Court about that matter. Therefore, the only point was, whether, under this contract, the architect's decision was final as to the amount to be deducted for omissions, or whether the builder was entitled to go to arbitration on that matter.

Mr. Clavell Salter, having supported the decision of the Divisional Court, their lordships held that on the true construction of the contract the decision of the architect on the question in dispute was final, and that the matter was not one for arbitration. The award of the arbitrator was therefore set aside, and the appeal allowed, with costs.

BLOOMSBURY ANCIENT LIGHT DISPUTE.

Mr. Justice Farwell, in the Chancery Division, on the 25th inst., concluded the hearing of the case of *Eason v. the Syndicate of Electrical Engineers*. The hearing of the action was commenced in July last, and adjourned over the long vacation.

This was an action for relief in respect of the alleged obstruction to ancient lights of property belonging to the plaintiffs in Gloucester-street, Bloomsbury. The property was purchased in 1899 by Mr. Eason and his then partner, Mr. Reynolds. Mr. Reynolds died, and there was a partition deed between members of the family, and one of the plaintiffs, Miss K. Reynolds, had a share in the property in question. The windows alleged

to be affected were those at the back of the houses which were opposite to the backs of the houses in Southampton-row. The defendants were the owners and lessees of three houses, Nos. 66, 68, and 70, Southampton-row, and these houses had been rebuilt to a greater height, the result of which, it was alleged, was to render the rooms in the plaintiffs' houses unfit for the purposes for which they had been used.

The evidence called on behalf of the plaintiffs included that of Mr. E. H. P. Eason, Mr. E. W. Eason, Mr. A. J. Gale, and Mr. A. W. Murray; the expert evidence given on behalf of the defendants being that of Mr. E. A. Cruning and Mr. Chatfield Clarke.

In the result his lordship dismissed the action, with costs. He said that the sole question he had to decide was one of fact, and he had directed himself in deciding the case in accordance with the principle laid down by the House of Lords in the case of the *Home and Colonial Stores v. Colls*.

Mr. C. E. Jenkins, K.C., and Mr. Percy Wheeler appeared for the plaintiffs; and Mr. W. H. Upjohn, K.C., and Mr. Colifax for the defendants.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

20,567 of 1903.—W. P. THOMPSON (Dimitar A. Popoff): *Water-closets*.

A water-closet in which, simultaneously with the delivery of a measured quantity of flushing water, a motion of the closing flap is caused, characterised by the arrangement that an upper flap is opened by a hand lever whilst a lower flap remains in a closed position under water seal, whilst, after use of the closet, on turning back the said hand lever the lower flap is opened, and, after the discharge of the excreta, returns automatically to the closed position so that when the closet is not in use both flaps are water sealed.

25,686 of 1903.—R. STANLEY and E. JEFFCOATE: *Process and Apparatus for Applying Glazes, Enamels, or Bodying Material to Bricks, Tiles, and other goods*.

A process of applying glaze, enamel, or bodying material to bricks, tiles, and other like goods, consisting in allowing a stream of the said material to flow from an outlet and dispersing or atomising the same by a jet or jets of steam, air-gas, or other fluid playing across it, thus scattering it upon the goods.

26,090 of 1903.—J. H. THOMPSON and F. W. PORTER: *Folding Partitions and Doors*.

Means for supporting and retaining removable or folding partitions and doors either in a straight line or on a curve, consisting of a shoe secured in a central position to the underside of each section or alternate sections of a partition or door, and swivelling on a block supported on rollers; a roller path, with a longitudinal slot therein, a guide uniting the aforesaid shoe and block, and its lower end inserted in the slot in the roller path so as to slide therein; a cap fixed in a central position on the top of each section or each alternate section of a partition or door; a vertical stud in said cap with a channelled or grooved head; and a plate fixed to the ceiling on each side of said stud with their inner edges inserted in the channelled or grooved head of the stud.

26,195 of 1903.—W. S. MCLENNAN: *Tables, Trays, or Reading Desks, or Combined Tables and Reading Desks, for Use in Bed or Elsewhere*.

A piece of furniture, comprising leg-carrying frames connected by lattice work, extensible sides, with or without connecting bars at intervals, boards hinged to bars on the frames and having spring clips and pins enabling them to be adjusted in various positions.

15,903 of 1904.—J. ANDERSON: *Saw Benches*.

An automatic saw bench, consisting in the combination of a frame having an abutting portion or stop, a tilting feed table adapted to move downward in contact with said stop and allow the work to engage and square itself thereby, and then be raised to be engaged by the feed mechanism, and means for tilting the table.

17,557 of 1904.—G. T. PIGCOTT, A. H. ROAD, and A. H. ADCOCK: *A Clip Socket for Shop-Window Fittings*.

This invention relates to a clip socket for shop-window fittings, and the mode and means of manufacturing same, and refers to the clips used on the standards or pillars for supporting the brackets or rods, and which clips are

* All these applications are in the state in which opposition to the grant of Patents upon them can be made.

adjustable and detachable from the pillars, and can be attached thereto anywhere desired without threading it over the end of the pillar as is usually necessary.

17,948 of 1904.—J. H. LANE: Door Stops or Checks.

A door stop, consisting of a bent lever attached to the spindle of the handle so as to move therewith, to which lever is attached one end of a wire or equivalent which passes down a tube fastened to the door and opens into a casing near the bottom of the door in which casing is free to slide up and down, a rubber or other faced plunger.

17,964 of 1904.—R. W. H. RODNEY: Door Furniture.

This invention relates to door furniture, the object being to obtain a better bearing for the spindle in the knob. In carrying the invention into practice a square metal tube is brazed, soldered, shrunk, or sweated into the square hole in the socket or neck of the knob. The usual hole is drilled and tapped and provided with a grub screw. It will be seen that when the loose knob has been pushed on to the spindle, and the screw tightened up, a secure hold is obtained in the knob, and on the spindle. In an ordinary knob the grip on the spindle is only the interior length of the socket or neck, while with the tube a grip is obtained right through the hollow knob.

18,179 of 1904.—E. ROLFE: Apparatus for Veneering or Coating Bricks, and the like.

An apparatus for veneering or coating bricks, and the like, consisting of a clay bar-forming machine, combined with a slicker, rods projecting from said machine, supporting said slicker, perforated flanges on said slicker through which said rods pass, and bolts threaded in said flanges bearing against said rods.

24,822 of 1903.—THE NEW EXPANDED METAL COMPANY, LTD. (J. F. GOLDING): Construction of Walls, Floors, and Similar Structures.

This invention relates to the construction of walls, floors, and similar structures. According to the invention, the bar may consist of longitudinal portions which are severed and bent outward from it so as to form loops into which the cement or concrete will enter and firmly lock the bar and the cement together. The said bar may be formed of flat metal and severed longitudinally at intervals and between such points that the portions at the divisions may be bent outwardly. The said portions are preferably bent alternately in opposite directions from the plane of the bar. The bar is preferably arranged in the concrete with the bent portions extending horizontally. In this manner a series of bends or loops are formed in the bar which are adapted to admit the cement so that the bar and the cement will be locked firmly together, and the weight-resisting strength of the bar will be transmitted to the concrete.

25,492 of 1903.—H. H. HODKIN: Construction of Concrete Floors and Ceilings.

This invention relates to the construction of concrete floors and ceilings, and refers more particularly to the metallic girders or supporting bars which are built in the concrete; the object being chiefly to obviate the cracking of the concrete in line with the supporting bar, and also to prevent the dropping of the bar. It consists in making the supporting bar or girder of longitudinally corrugated iron or steel, and supporting the ends and junctions in bearings preferably made by punching out a wavy slot to receive the end of the bars and bending the foot to shape so as to support the bars upon their edges. The wavy form of the corrugations avoids the formation of hollows which occur with the use of ordinary forms of girders.

25,676 of 1903.—O. IMRAY (Firm of Herren, Graubner, and Scholl): Method of and Apparatus for Measuring the Surfaces of Flat Objects.

A method of measuring the surfaces of flat objects at a single operation, whereby the object, the surfaces of which is to be measured, effects the closing of electric contacts which are distributed over the whole surface to be measured, the closing of such contacts being made to effect the decrease or increase of the resistance or the current strength in an electric circuit, and thereby to vary in a corresponding manner the indications of a measuring instrument included in such circuit.

26,115 of 1903.—W. R. HODGKINSON: Wood and other Porous Materials to Protect Against Damp, Fungus, or Insects, or other Colouring.

This consists in the introduction into woods and other porous substances of dyes, waxes, and the like, by means of a volatile solvent, and the employment of a vacuum or partial vacuum, and atmospheric pressure.

27,358 of 1903.—A. D'ARSONVAL, G. E. GAFFE, and G. GALLOT: Apparatus for Ozonising Air for Disinfecting Purposes.

A process of ozonising air for disinfecting purposes, which consists in cooling and humidifying the air or oxygen, and then passing it through an ozonifer.

12,105 of 1904.—E. STOFFLER: Manufacture of Recessed or Perforated Bricks or Blocks.

A method of manufacturing recessed or perforated bricks or the like, consisting in lightly moulding the brick by smooth top and bottom dies, subjecting the moulded brick which remains in the mould to the action of a second pair of dies having pins or rods which finish the moulding operation, bringing the mould with the brick or the like under or above a third plain die or the like to eject the brick from the mould.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

Table listing property sales including dates, locations, and prices. Examples: October 11.—By DUNN, SOMAN, & Co. (at Tonbridge) 137, High-st. (s.), f., e.r. 422l. 137, High-st. (s.), f., e.r. 422l. 137, High-st. (s.), f., e.r. 422l. 137, High-st. (s.), f., e.r. 422l.

MEETINGS.

Table listing various meetings and events. Examples: SATURDAY, OCTOBER 29. Junior Institution of Engineers—Visit at 3 p.m. of the National Physical Laboratory, Bushy House, Brighton. SENIARY INSTITUTE (PROVINCIAL SEASONAL MEETING SOUTHAMPTON)—Discussion, to be opened by Dr. Lander, on "Infectious Fever Hospitals." 11 a.m.

TO CORRESPONDENTS.

J. L. (Amounts should have been stated).—G. T. (Below our limit).—T. D. and Sons (We cannot supply your letter). NOTE.—The responsibility of signed articles, letters and papers read at meetings rests, of course, with authors. We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents sent to him at this office, unless he has specially acknowledged them. Letters or communications (beyond mere news items which have been duplicated for other journals) are not DESIRED. All communications must be authenticated by name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications. We are compelled to decline pointing out books giving addresses. Any communication to a contributor to write an article or to execute or lend a drawing for publication, is subject to the approval of the editor, or drawing, if received, by the Editor, who retains the right to refuse if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply acceptance. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER and not to the Editor.

CURRENT OF MATERIALS.

Our aim in this list is to give, as far as possible, the true prices of materials, not necessarily the lowest, and quantity obviously affect prices—a fact should be remembered by those who make use of information.

Table listing various materials like Bricks, Tiles, and Stone with their prices per 1000 or per yard. Includes sub-sections for Bricks, Tiles, and Stone.

Table listing Stone materials such as Portland Cement, Blue Lias Lime, and various types of Stone (e.g., Bath Stone, Portland Stone).

Table listing Slaters materials including various types of slates and their prices per 1000 or per 100 sq. ft.

Table listing Slates (continued) with prices per 1000 or per 100 sq. ft. for various grades and colors.

Table listing Tiles with prices per doz. or per 1000 for various types like roof tiles, ornamental tiles, and floor tiles.

Table listing Woods with prices per standard unit for various types like Fir, Deal, and Pine.

Table listing Joists and Girders with prices per ton for various types and sizes.

Table listing Metals with prices per ton for various types like Iron, Steel, and Lead.

Table listing English Sheet Glass in Crates with prices per ft. delivered for various sizes and weights.

Table listing Wood (continued) with prices per square for prepared flooring and various types of wood.

Table listing Joists, Girders, &c. with prices per ton for various types and sizes.

Table listing Metals with prices per ton for various types like Iron, Steel, and Lead.

Table listing Oils &c. with prices per gallon for various types like Linseed Oil, Turpentine, and Lead.

Table listing Varnishes &c. with prices per gallon for various types like Pale Oak Varnish, Copal Varnish, and others.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tender to be Deposited
Cast-Iron Siphon, near Salford Bridge	Aston, etc., Joint Sewerage Com.	Borough Surveyor, Council House, Acton Manor	Oct. 31
Steam Traction and Rolling Plant	Andover Corporation	R. W. Knapp, Borough Surveyor, High-street, Andover	Oct. 31
54 Rods of Oak Post & Iron Fencing, Hershham Grn.	Walton-upon-Thames U.D.C.	R. Wilds, Surveyor, Council Offices, Walton-upon-Thames	Nov. 1
600 yds of Sewers	Handsworth U.D.C.	H. Richardson, Engineer, Council House, Handsworth	Nov. 1
Painting Rating in Twenty-six Parishes	Narrow-on-Soar R.D.C.	G. H. Lea, Highway Surveyor, Mountsorel, near Loughborough	Nov. 1
Enlargement of Workhouse, Chell	Walstanton and Burslem Guardians	W. F. Slater and W. H. Walley, Architects, Burslem	Nov. 1
Premises, Castle-place, Belfast	Mr. C. McCallagh	S. C. Hunter, 2, Wellington-place, Belfast	Nov. 1
Painting Interiors of Six Firemen's Houses	Leeds Corporation	City Engineer's Office, Leeds	Nov. 1
Sewerage Works, Contract No. 53	Pudsey Corporation	J. Jones, Borough Surveyor, Church-lane, Pudsey	Nov. 1
Store and Two Houses, Woodside, Horsforth	Leeds Industrial Co-operative Soc.	24, Meadow-road, Leeds	Nov. 1
Laying Water Pipes, Pembroke		Borough Surveyor, Municipal Offices, Pembroke Dock	Nov. 1
Mission Hall, Barnby-road, Newark		Sheppard & Harrison, Architects, Bargate, Newark	Nov. 1
Additions to Schools, Barnby-road, Newark		do.	Nov. 1
Three Miles of Cast-Iron Water Mains, Wickford	Billerley R.D.C.	Merryweather & Sons, Ltd., Greenwich-road, London, S.E.	Nov. 1
Spans	Secretary of State for India	Director-General of Stores, India Office, Whitehall, S.W.	Nov. 1
1,000 Galvanised Steel Ash Rins	Warrington Sanitary Works Com.	Cleaning Superintendent, Central Sanitary Depot, Howley	Nov. 1
Storm-overflow Sewer, near Glinakirk-road, Knock	Belfast Improvement Committee	City Surveyor, Town Hall, Belfast	Nov. 1
Rebuilding, etc., No. 21, Dunraven-street, Tonypandy	Mr. R. Oliver	E. Jones, Architect and Surveyor, North-street, Tonypandy	Nov. 1
400 Gallon Water Van	Flet's Cray U.D.C.	W. T. Streater, Surveyor, Town Hall, Waltham, Essex	Nov. 1
Earthenware at Workhouse	Stoke-on-Trent Guardians	C. Daniel, Clerk, Union Offices, Stoke-upon-Trent	Nov. 1
New Road, Old Town, near Hebbeln Bridge	West Derby Guardians	J. Judson & Hudson, architects, Bognorhe, near Keighley	Nov. 1
Extension of Main Buildings, Belmont Classification Hos.	Waltham Holy Cross U.D.C.	C. H. Lancaster, Arch., Brougham-ter., West Derby-rd., Liverpool	Nov. 1
Printing Works and Shops, Manchester-rd., Bradford	Manchester Education Committee	W. H. T. Streater, Surveyor, Town Hall, Waltham, Essex	Nov. 1
300 yds. Wrought Iron Unclimbable Fencing	Watford U.D.C.	Education Offices, Deansgate, Manchester	Nov. 1
School Desk, Crumpsall-lane Municipal School	Coleridge U.D.C.	Engineer's Office, Office of Council, Watford	Nov. 1
Pipes for Water Mains	Leth Town Council	J. Barclay, Surveyor, Municipal Offices, Coleridge	Nov. 1
Street Improvement Works, Chiswick	do.	Borough Surveyor's Office, Charlotte-street, Leth.	Nov. 1
Whinstone Setts, etc.	Peterborough Corporation	J. C. Gill, Engineer, Waterworks Engineer's Office, Peterborough	Nov. 1
Carting for Reconstruction of Tramways	do.	do.	Nov. 1
Cast-Iron Pipes	do.	do.	Nov. 1
Sluice Valves, etc.	do.	do.	Nov. 1
Patg. Outside of Suffolk Conv. Home, Felixstowe	do.	do.	Nov. 1
9-in. Bore, 300 ft. deep, near Wells	do.	do.	Nov. 1
400 yds. Wire Fencing, etc., side of Wych. Colham-grn.	do.	do.	Nov. 1
1,800 yds. of Galvanised Framed Iron Water Pipes	do.	do.	Nov. 1
Cast-Iron Pipes and Castings	do.	do.	Nov. 1
Hous. Luddenden Foot	do.	do.	Nov. 1
Factory Premises, Horsforth	do.	do.	Nov. 1
Sea Wall at Epsom	do.	do.	Nov. 1
Scarfing and Rolling Roads	do.	do.	Nov. 1
Electric Lighting of Premises, Aberaman	do.	do.	Nov. 1
Water Softener	do.	do.	Nov. 1
Tank to Hold 9,000 Gallons	do.	do.	Nov. 1
Stores	do.	do.	Nov. 1
Renov. and Addl. Wes. Minister's House, St. Agnes	do.	do.	Nov. 1
Four Bathrooms, etc., in Infirmary Workhouse	do.	do.	Nov. 1
360 yds. lineal of Close-boarded Fencing, Stokes	do.	do.	Nov. 1
Extension of Water Mains at Wargrave	do.	do.	Nov. 1
Electric Wiring and Fittings for Town Hall	do.	do.	Nov. 1
250 yds. of Storm Water Drains	do.	do.	Nov. 1
500 ft. of Comprehending in River Thames	do.	do.	Nov. 1
Police Station, Alexandra-road	do.	do.	Nov. 1
Rebuilding Malt Bars, etc., Cameron Bridge Distillery	do.	do.	Nov. 1
Sea Wall and other Works	do.	do.	Nov. 1
*Fire Mains, Electric Belts, Gas Lighting	do.	do.	Nov. 1
*Marble Mosaic, Faintance Ware	do.	do.	Nov. 1
Widening Westleigh (Hundred) Bridge, Leigh	do.	do.	Nov. 1
Alterations of Worsley Canal Bridge	do.	do.	Nov. 1
Alterations at Workhouse, Ardee, Ireland	do.	do.	Nov. 1
Asphaltic Pavng Wic. near station-rd., Warrington	do.	do.	Nov. 1
Small Sanitary Annex at Workhouse	do.	do.	Nov. 1
Sanitary Plumbing and Water Service	do.	do.	Nov. 1
600 lineal yds. of 3-in. Cast-Iron Main, Womersh	do.	do.	Nov. 1
70 yds. lineal of Boundary Walling, Flixton-road	do.	do.	Nov. 1
20 yds. lineal of Closeboarded Fencing, Harrow-road	do.	do.	Nov. 1
*Artisans' Dwellings	do.	do.	Nov. 1
Thames Waterworks	do.	do.	Nov. 1
Cast-Iron Pipes	do.	do.	Nov. 1
Sewage Works	do.	do.	Nov. 1
Stores	do.	do.	Nov. 1
Renovation of Manse Property, Boardmills, Belfast	do.	do.	Nov. 1
Electric Light, Wiring, etc., at Offices, Peadry	do.	do.	Nov. 1
Wiring Electric Light Works, Stuart-street	do.	do.	Nov. 1
*New Coastguard Buildings at St. Anne's Head	do.	do.	Nov. 1
Painting Properties	do.	do.	Nov. 1
Electric Power Station and Workshops, Bangour	do.	do.	Nov. 1
*Making-up Castellain, Widley, and Wymering Roads	do.	do.	Nov. 1
Road Materials	do.	do.	Nov. 1
Extension of Accumulator House	do.	do.	Nov. 1
Bakehouse for District Lunatic Asy., Ballinasloe	do.	do.	Nov. 1
Bakehouse Machinery	do.	do.	Nov. 1
Metalling and Making Good Edward-street	do.	do.	Nov. 1
*Making-up Howard's-lane, Putney	do.	do.	Nov. 1
*New Road at Smiththornton-lane, Coulsdon	do.	do.	Nov. 1
*Road and Sewer Works, Edgware	do.	do.	Nov. 1
*New Council's School at Horley	do.	do.	Nov. 1
Steel Girder Bridge over Canal	do.	do.	Nov. 1
Electric Lighting at Workhouse, Chell	do.	do.	Nov. 1
*Dwarf Wall and Iron Fencing, etc., at Offices, Pleadry	do.	do.	Nov. 1
Enlarg. of Council Schs., Dennis-rd., Balsall Heath	do.	do.	Nov. 1
*Underground Sanitary Conveyance	do.	do.	Nov. 1
5 1/2 Miles of Railway, Tongwynnias to Treforest	do.	do.	Nov. 1
*Bennial Contracts	do.	do.	Nov. 1
*New Coastguard Buildings at Uzon, Forfar	do.	do.	Nov. 1
*New Coastguard Buildings at Preston, Lincoln	do.	do.	Nov. 1
*New Post Office at Teek	do.	do.	Nov. 1
*Alterations to Police Station, St. Albans	do.	do.	Nov. 1
One 200-kw. Direct Current Dynamo	do.	do.	Nov. 1
One Water Tube Boiler	do.	do.	Nov. 1
Paving Carriageways, Lintorpe-road	do.	do.	Nov. 1
*New Schools, Newcastle-on-Tyne	do.	do.	Nov. 1
City Hall at Castle-terrace, Edinburgh	do.	do.	Nov. 1
*Supply of Stores, Materials, etc.	do.	do.	Nov. 1
*New Schools, Newcastle-on-Tyne	do.	do.	Nov. 1
Painting Iron and Steel Work in Workshop	do.	do.	Nov. 1
Six Tenements, Parkhead, Glasgow	do.	do.	Nov. 1
Five Cottages	do.	do.	Nov. 1
Pair of Semi-detached Villas	do.	do.	Nov. 1
2,882 yds. of Brick and Pipe Sewers	do.	do.	Nov. 1
Milnthorpe Homes, Macclesfield Old-road, Buxton	do.	do.	Nov. 1
Church, near Bedlington Station, Northumberland	do.	do.	Nov. 1

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, Applications to be in. Includes entries for Surveyor and Structural Assistant.

Those marked with an asterisk (*) are advertised in this Number. Competitions, — Contracts, iv. vl. viii. x. Public Appointments, xviii.

TENDERS.

Communications for insertion under this heading to be addressed to "The Editor," and must reach later than 10 a.m. on Thursdays. [N.B.—We publish Tenders unless authenticated either by architect or the building-owner; and we cannot accept announcements of Tenders accepted unless the name of the Tender is stated, nor any list in which the Tender is under 100l., unless in some exceptional cases and for special reasons.]

Notes accepted. † Denotes provisionally accepted.

GRHAM.—For new workhouse infirmary, for the year. Mr. H. Bech, architect, Chesham:—

GRHAM.—For the supply of 5,000-ft. run 12 in. granite flat kerb, and 5,000-ft. run 12 in. granite flat channel for the Town Council, J. C. May, Borough Engineer and Surveyor, Hali, Brighton:—

GRHAM.—For the supply of 1,900 tons of granite or other hard stone, for the Town Council. Per ton, s. d.

GRHAM.—For the installation of electric lights, and fire alarms in diphtheria pavilion, Sanatorium, Bear road, for the Corporation:—

GRHAM.—For cast-iron pipes and work, for the Messrs. S. Edmondson, Surveyor, 18, Nicholas-lane, London. Mr. W. Hargreaves Bourne, architect, Darlington:—

GRHAM.—For new drainage scheme, "Almond" in the town of St. George, Brighthelm, Mr. W. Harlow, architect, Darlington:—

GRHAM.—For erecting a coker and laundry centre at Avenue-road School, for the Education Committee. Mr. G. J. Brown, architect and surveyor, Cathedral-offices, The Close, Norwich:—

EALING.—For the erection of suburban villas in Graham-avenue and Northcroft-road. Mr. L. A. Tyler, architect, 10, Melody-road, Wandsworth, S.W.:—

EATON BRAY.—For sewerage works, for the Rural District Council. Messrs. Elliott and Brown, engineers, Burton-buildings, Parliament-street, Nottingham:—

HATTON.—For construction of a sewage tank, etc., in connection with the Hatton sewerage works, for the Rural District Council. Mr. J. T. H. Richardson, engineer, Hatton, near Rugby:—

ILFORD.—For making up roads for the Urban District Council. Mr. H. Shaw, Engineer, Town Hall, Ilford:—

LEEK (Staffordshire).—For sewerage and other works at the workhouse, for the Guardians. Mr. J. T. Drealley, architect, Piccadilly-buildings, Hanley:—

LEIGH (Lancs.).—For the erection of new Municipal Offices, from ground floor upwards, for the Corporation. Mr. J. C. Prestwich, architect, Leigh:—

LONDON BOARD OF EDUCATION TENDERS. Camberwell, N., Cradon-road (additional works). [Rebuilding the boys' school at the Cradon-road school, and rebuilding them with iron standards and glazed divisions. The cost of this extra to be calculated as a variation upon the contract of Mr. A. Porter for carrying out sanitary and drainage works at the school.]

W. Downs, £3,370; W. Smith & Son, £2,861; F. G. Minter, £1,190; J. & C. Bowyer, £2,847; J. F. Ford, £3,182; T. D. Long, £2,820; R. A. Jewell, £3,068; Lathey Bros., £2,687; Rice & Son, £3,038; Wor. Ltd., £2,028; W. Akers & Co., £2,028; E. P. Bulled & Co., £2,917; W. J. Mitchell, £2,570; Turnbull & Son, £2,903; Son, Dulwich, £2,548.

Stepney, Dempsey-street (Partitions, etc.). E. & F. J. Wood, £1,900; W. Shurmer & Parrott & Isom, £1,894; Sons, Ltd., T. S. Elkington, £1,012; Sons, £700; A. J. Sheffield, £700; E. Lawrence & Sons, £698; 0.

Bethnal Green, S.W., Somerfield-street (Partitions, Staircases, etc.). A. Porter, £3,461; W. Shurmer & Sons, £2,707; Ltd., £2,394; E. & F. J. Wood, £2,724; J. Grover & Son, £2,382; G. Mundav & Sons, £2,629; G. S. S. Williams & Son, £2,365; E. Lawrence & Sons, £2,595; General Builders, £2,475; Limited, Wharfedale, £2,455; Willmot & Sons, £2,454; McCormick & Sons, £2,454; Hill, £2,297.

Fulham, Finlay street New School (Heating Apparatus). J. Fraser & Son, £838; Macintosh & Sons, Ltd., £702; J. Richmond & Co., Ltd., 760; Z. D. Berry & Sons, 752; J. & F. May, 745; Victoria-street, 689.

Walworth, Flint-street Improvements (Heating Apparatus). Wenham & Waters, Ltd., £502; Brightside Foundry & Engineering Co., Ltd., 493; Davis & Bennett, £490; B. Harlow & Son, 467; J. & F. May, 33; Whetstone-park, 435.

LONDON.—For erecting engineer's workshop, etc., at the Infirmary, Lambeth, for the Lambeth Guardians. Messrs. Woodward, Brooks, & Lattar, surveyors, 65, Kennington Oval, S.E.:—

LONDON.—For the construction of a relief sewer, in the metropolitan boroughs of Wandsworth and Battersea, in connection with a new pumping-station at the junction of York-road and Crook-street, Battersea, for the London County Council:—

S. Pearson & Son, Ltd., £71,133 16 5; R. Malpas & Sons, £60,636 13 6; J. Watt, £57,886 17 9; Pethick & Johnson, £56,008 0 0; J. Dickson, £55,564 5 11; Leach, £53,336 4 9; J. Mowlem & Co., Ltd., £50,874 0 0; J. Moore, £50,600 6 0; Muirhead, Greig, & Matthews, £50,572 9 5; J. B. Squire & Co., £50,011 13 11; Langley, £40,409 14 8; W. Kempney, £39,128 10 3; A. Woodhouse, £47,531 4 10; J. D. Nowell & Sons, £40,978 13 6; Lopinot, £40,978 13 6.

† Recommended for acceptance. (The chief engineer's estimate of the cost of the work was £53,968 0s. 1d.)

LONDON.—For the reconstruction of Miter-bridge, carrying Scrubs-lane over the Grand Junction Canal, for the London County Council:—

E. Miskin, Ltd., £9,925 7 4; Greig, & Squire & Co., £9,922 15 6; Matthews, £6,105 0 6; Westwood & Co., Ltd., £6,565 18 11; Pethick Bros., £6,075 16 6; A. Pacey & Son, £5,970 11 3; W. Jansy & Son, Ltd., £5,978 1 7; Perry & Co., £6,335 7 3; J. Dickson, £5,890 10 10; W. Jansy & Son, Ltd., £5,723 0 0; Mawoh & Sons, £5,723 0 0.

MIDDLEHAM.—For alterations and additions to the White Swan Hotel, Middleham, near Leuburn, for Messrs. P. Plesch & Sons, Mr. W. Hargreaves Bourne, architect, Darlington:—

C. Bushby & Sons, £1,059 13 0; R. G. Smith, Darlington, £1,045 10 0; J. P. Johnson & Son, £1,030 12 2; Chaplro & Pearsons, £89 15 0; Richardson & Robson, £93 3 1.

NEW BARNET.—For making-up Middle-road and Shaftesbury-avenue and tar-paving the footpaths, for the East Barnet Valley Urban District Council. Mr. H. York, surveyor, Station-road, New Barnet:—

	Roadmaking.		Tarpaving.	
	Middle-road.	Shaftesbury-avenue.	Middle-road.	Shaftesbury-avenue.
	£	£	£ s. d.	£ s. d.
M. S. Kitteringham	559	510	—	—
G. Bell	547	478	—	—
E. Rogers & Co.	548	475	—	—
Grounds & Newton	519	400	50 0 0	46 0 0
J. Jackson	465	405	100 0 0	95 0 0
T. Adams, Wood Green	419*	392*	57 10 0	49 13 0
J. Walwright & Co., Ltd.	—	—	53 15 0	55 6 3
J. Smart & Son	—	—	44 11 9	45 15 0
Vickers & Field	—	—	45 19 7	41 19 7
R. J. Goddard & Co., Caledonian-road	—	—	44 19 2*	38 15 2*

PENGAM.—For the construction of a new road, for the Bedwellty Urban District Council. Mr. J. H. Lewis, surveyor, Blackwood, Mon. —
W. Lewis, Ceta Bryn, Bithdir, via Cardiff* £1,283

PONTNEWYDD (Mon.).—For alterations and additions to the National Schools, near Newport. Mr. W. H. Dashwood Cape, architect, Church-street-chambers, Cardiff:—
J. Charles £160 0 0
E. Thomas & Co. 430 0 0
C. H. Reed 429 0 0
K. Knowler & Herbert

PRESTON (Sussex).—For roadworks in the Upper Drive, Preston Rural, for the Steyning East Rural District Council. Mr. G. W. Warr, Surveyor, Council Offices, Southwick:—
Parsons & Sons, 118, Church-road, Hove* £2,050
[Tenders were also received from seventeen other firms.]

SOUTHEND-ON-SEA.—For making-up streets for the Corporation. Mr. E. J. Elford, Borough Engineer, Southend:—

Dovecot-avenue.
D. Jackson £848 8 7
J. C. Trueman 807 16 7
W. Iles 798 0 0
[Surveyor's estimate, £801 12 11.]

Finchley-road.
W. Iles £195 0 0
D. T. Jackson .. 187 5 0
[Surveyor's estimate, £199 2 0. Work to be carried out by direct labour.]

Chelmsford-avenue.
J. C. Trueman £1,098 0 0
D. T. Jackson 1,096 11 1
[Surveyor's estimate, £1,092.]

WHITLEY BAY.—For new road over the Liuks, etc., for the Whitley and Monkseaton Urban District Council. Mr. J. P. Spencer, architect and surveyor, 30, Howard-street, North Shields:—

T. B. Biston & Robson £1,815 18 6
J. Browell .. 1,290 2 0
W. T. Weir .. 1,190 0 0
Harbottle .. 1,153 8 0
M. D. Young .. 1,147 5 0
G. E. Simp-son

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ESTIMATES GIVEN FOR EVERY DESCRIPTION OF ROAD MAKING.

WEST HARTLEPOOL.—For erecting a warehouse in Villiers-street. Mr. W. Young, architect, Park-road, West Hartlepool:—
M. McDonough .. £384 10
G. Booth

*** * BOLTON-UPON-DEARNE.**—In our issue for October 15, p. 401, the name of the tenderer for two works for the Urban District Council of Bolton-upon-Dearne is given as "H. Sydney," whereas it should have been S. Hamilton. The mistake arose from the way in which the name was written ("Hamilton Sydney") in the manuscript we received.

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The Builder.

VOL. LXXXVII.—No. 3222.

NOVEMBER 5, 1904

ILLUSTRATIONS.

Part of Cartwright Memorial Hall, Bradford.....	Messrs. J. W. Simpson and E. M. Allen, Architects.
Decorative Designs for Textiles, etc.	By Mr. E. Walker and Mr. Lancelot Crane.
Premises, 91 99, Oxford-street)	Messrs. Read and Macdonald, Architects.
Side Entrance, 91, Oxford-street)	
Priory Court, Hampstead	Messrs. Palgrave and Co., Architects.
Friars School, Bangor	Messrs. Douglas and Minshull, Architects.

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Notes on Naples.



FIFTY years ago the once splendid mediæval city of Naples had become a filthy agglomeration of tenement houses, harbouring the most degraded of civilised beings. A sort of magnified London Seven Dials in its worst aspect. Amongst endless courts and alleys of this most pleasurable human community of the Nineteenth century rose a few old palaces of a decadent nobility, culminating in the Royal Palace designed by Domenico Fontana in 1600, a huge uninteresting mass, sufficiently expressive of the Bourbon style of government and the rule of tyrants which built and inhabited it of luxurious superfluity. On one side of this huge pile stands the ancient castle of the Anjou kings of Naples, founded by their Bourbon successors as a memorial in XVIIIth century fashion, and on the other side is the huge opera house of S. Carlo, one of the largest in the world. The kings of the period seem to have appealed to the fears, as well as to the well-known love, of their poorer subjects for the theatre, by surrounding their palace with such accomplishments. Fortunately, the Bourbons and all that their name suggests have long since utterly disappeared, and Naples exhibits an instance of that marvellous assimilation of modern ideas and improvement,

both moral and physical, which is the happy characteristic of Modern Italy.

The great cholera outbreak of 1884 may perhaps be credited with having brought about a great part of the rebuilding of the city; at least, the principal impetus towards that result was probably the well-founded fear of another such terrible visitation. During the last twenty years the greater portion of the filthy old *Fondacci* or enormous tenement houses, which were the perennial hot-beds of diseases of all kinds, have been removed, and the old mediæval portion of the city has been cut through by two main streets of great width, forming a cross, at the centre of which is an octagon piazza with a statue (not yet finished) of the prime minister Depretis, to whom the scheme seems to be attributed. The extremities of this cross plan are united by a circular system of tramways. The plan is distinctly successful and ingenious. By this means several ancient public buildings, such as the cathedral, some of the more interesting Renaissance palaces, and several new edifices, such as the railway station, university, and Ministry of Marine, have been brought into prominent positions and freed from the squalid surroundings which formerly rendered them unknown to the general public.

The disappearance of XIXth century Naples may perhaps be regretted by a certain class of pictorial artists, who must now search in remote corners for the umbrella-covered booths in dirty old back streets, where the *lazzaroni* and

monelli still feed on macaroni in a primitive way with their fingers, affording subjects for pictures of a very squalid state of society in the past. But to the student of art in its interesting developments in Southern Europe the removal of all this very uninviting squalor is more of a gain, and the artistic treasures which are now being laid bare in the *sventramento* of the city are of particular interest. As time goes on many more traces of the mediæval architecture of the city must come to light—it is, as a general rule, smothered in the preposterous plaster and whitewash of the past three centuries, and it is surprising that so much should evidently remain beneath the surface.

The plan of the mediæval city is still well defined by remains of the walls, round towers, and gates which were built by the first Spanish conquerors of the kingdom, and which probably follow, to a great extent, the original lines of the Angevin city: These remains are embedded in the old houses which line the modern boulevards on the south and east of the city occupying the sites of ancient moats. Naples seems to have been very much rebuilt by the Angevin kings on the transference of the capital of the Sicilian kingdom from Palermo, and it is to this period that most of the more important and interesting architectural monuments belong (Charles I., 1266—Joanna II., 1414). The Angevin dynasty may be considered to represent the pointed-arch period in Neapolitan history: With the Spanish despotism began the period of decline, and few



Fig. 1. Sketch Plan of Santa Chiara.

monuments of the Renaissance or Pseudo-Classic are worthy of note in Naples in comparison with similar work in the northern cities of Italy.

Like a vegetation, the pointed-arch style of mediæval Europe (which, by the way, has so often been compared to the

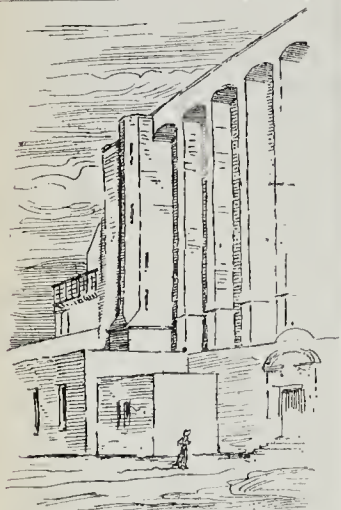


Fig. 2. East side of Santa Chiara.

natural growth of forest glades) seems to follow the lines of latitude and climate in a very remarkable manner. From the Canary Islands to Cyprus, through all the Mediterranean lands, the same methods of design and workmanship mark the development of the pointed

arch. French architectural writers endeavour to maintain that all this vast region once owned the influence of French artists; but how is it conceivable that the thinly-populated France of those days could have supplied the regular armies of architects and masons which must have been employed in Portugal, Italy, or Cyprus during the XIVth century to allow of Frenchmen building the immense cathedrals, castles, palaces, not to mention smaller buildings, which still stand in ruins all round the Mediterranean? In the case of the Neapolitan kingdom such a French influence may more easily be admitted, in consequence of the political history of the period. But, as a rule, the architecture of the Mediterranean littoral has a character quite its own, and betrays hardly more French than English or German influence. Wherever there was a distinct colony of northerners established on these southern shores, there one may trace some evidences of a desire to reproduce the features of the national style; elsewhere the local character asserts itself.

Some of the more salient features of the pointed style of the Mediterranean are a regularity of plan, adherence to a columnar method of construction (which with the flat-pitched roofs recalls the older Romanesque), and that constant evidence of a struggle in principles between the terrace roof of the South and the aspiring tendencies of the pointed design. Many minor peculiarities rarely seen in the pointed architecture of the North may be attributable to differences in materials employed, as much as to the artistic character of the southern races. The tufa, lava, and other building materials peculiar to the volcanic regions of the South naturally influence the style of



Fig. 3. North Porch, Santa Chiara.

architecture to a very appreciable extent. The elaborate sculptured foliage a delicate details of the North, executed the abundant limestone of England a France, is absent, and the Gothic architects of Naples were content with painted mouldings as a relief to the white walls of their vast public buildings.

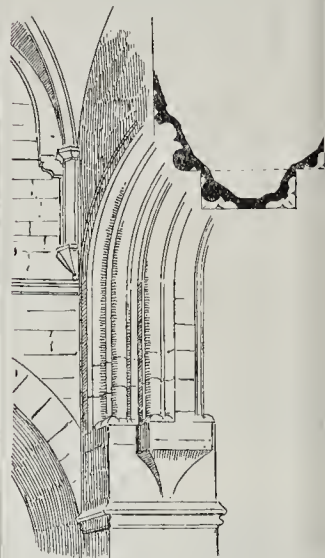


Fig. 4. Detail of Centre Arch to Porch, Santa Chiara, Naples.

A striking peculiarity in the great doorways of the early XIVth century is the design of a number of receding arch mouldings much like those of the English "Decorated" style, with deep hollows and boldly-projecting mouldings, but with a large outer order in addition, sometimes in the form of a dripstone, on the underside of which



Fig. 5. A Palace Doorway.

vine or acanthus leaves are carved. The outer order or arch springs from the side capital of the doorway, unless it forms a dripstone, and then it finishes on an elaborately-carved bracket. Square-headed windows—common everywhere—are treated with this same sort of dripstone, which always finishes on a bracket and not, as in the later styles of Eng-

vaulting (Fig. 4) illustrates many of the peculiarities of southern mediæval art.

Within its vast interior Santa Chiara still enshrines many sumptuous tombs of the Angevin kings and princes of Naples, hut the frescoes of Giotto—said to have been painted under the advice of Dante—have disappeared for ever; at least, it is not likely they can be traced beneath the plaster alterations of the Pseudo-Classic style. The monument of King Robert, founder of the church, still dominates the high altar in the curious way in which princely tombs seem to have been usually arranged in the XIVth century in Naples. The king is represented in a lower compartment, as dead, in the dress of a Franciscan; whilst above, in a canopied tabernacle, he sits in royal state; the figures are, of course, life-size. Other examples of this very singular form of tomb occur in Naples; the tomb of King Ladislaus and Queen Joanna in S. Giovanni a Carbonara is a remarkably fine specimen. In Santa Chiara the Gothic tombs, with their pointed arches and bizarre decoration of mosaic inlaid twisted columns, etc., have a most weird, incongruous effect, imbedded as they are in the gilded plaster of modern times.

The doorways of old palaces which we illustrate (Figs. 5, 6, 7) are singularly characteristic of mediæval urban architecture in south Italy. They are marked by a bold simplicity in outline and detail, and they were evidently designed for the special purpose of forming imposing entrances from narrow streets where architectural display would have been thrown away. The street fronts of these palaces are absolutely plain and unadorned, rows of square window openings on one side of a narrow lane confront equally uninteresting rows on the other side. Piazzas of any size were evidently unknown in mediæval Naples, and only within the last twenty years has the great *piano regolatore* of the city been formed with the ideas current all over Italy at the present day, wide streets and large open spaces letting air and sunshine into crowded localities.

We give two plans of Naples, mere rough sketches based upon an old plan of the city made for Murray's "Guide" of fifty years ago. At the period when a certain Mr. Blewitt (who, by the way, seems to have been a very learned and capable man) wrote this book for the great publisher, the traces of the ancient city (Fig. 8) were wonderfully preserved. The fortifications on the peninsula between the Castel dell' Oro and S. Elmo had, however, disappeared, as no gate on that side is mentioned. The Chiaja or esplanade fronting the sea had come into existence and the modernisation of the city had commenced; the railway was being carried to the north, and a few years later the enormous increase in the population—chiefly amongst the poorer classes—took place.

Our second plan (Fig. 9) gives a rough idea of the *piano regolatore*. The roads marked on it show the principal tramway routes and modern means of communication; the new streets and roads are on a fine scale of an average width of more than 200 ft. The general idea is to give a principal road, or "viale," encircling the main portion of the town and its

western suburbs, of about ten miles in length, connecting together the railway station and the distant Posillipo, with its famous tunnel, which opens up the attractive district of Villanova and its villas.

In the middle ages, under the Angevin dynasty, Naples was a city of perhaps more imposing architectural character than is generally recognised. Then ensued a period of decline and squalid decay, from which the great city has suddenly awakened under the influences of a united Italy, and now its future seems one of an enlarged life, commercial prosperity, and, above all, greatly improved hygienic conditions, both moral and physical, the credit for which must be given to an enlightened government, assisted by capable architects and engineers.

NOTES.

Engineering Works in India.

IN the course of his Presidential address at the opening meeting of the eighty-sixth session of the Institution of Civil Engineers, Sir Guilford Molesworth referred at some length to the Public Works Departments of India and Ceylon, with which he was connected for a period of more than thirty years. It is undoubtedly the fact, as the speaker remarked, that the Indian Empire owes much to the vigorous policy pursued in the execution of irrigation and railway undertakings. Owing to climatic conditions the inhabitants are very largely dependent upon artificial irrigation, the extension of which during recent years has done much for the prevention of those calamitous famines which periodically spread devastation through many districts of the country. Next to irrigation, railways represent the most important means for the welfare of the people, and Sir Guilford believes that the time has now come when the vast mineral and other resources of India might be usefully employed in the manufacture of steel rails and other permanent-way materials, as well as in the building of bridges, locomotives, and rolling-stock generally. The application of a similar policy to every department of public engineering work would certainly assist very materially in opening up the immense but hitherto undeveloped wealth of India.

The Simplon Tunnel.

RECENT reports relative to the latest difficulties encountered in the Simplon tunnel works seem to show that no doubt need be entertained as to the successful completion of the tunnel, although no correct estimate can be formed of the time that may elapse before the work is finished. Everything possible is being done to facilitate progress, but the difficulty of the present situation is increased by the fact that the cooling plant in the Italian workings is of comparatively small capacity. As the headings approach the Swiss workings, which were closed in a submerged condition some four or five months ago, the danger and difficulty of the work will materially increase. The crown of one Italian tunnel will come out at the floor level of the corresponding

Swiss advance drift, which for structural reasons is not in true alignment. At the moment when the barrier of rock is removed there undoubtedly is a great rush of water from the Swiss side, unless adequate measures be taken to pump out or drain away the water accumulated in the workings. The Swiss pumping plant may be found sufficient to cope with work, but it is not improbable that a second Italian heading will be advanced so as to tap the impounded water at a higher level, and so to facilitate junction between the two first-mentioned workings. When the critical point arrives, the extensive cooling plant on the Swiss side will be of great assistance to the Italian workmen. Through the progress of the undertaking, a second or auxiliary tunnel has been the greatest service as a drain, operations could scarcely have continued without its aid.

The Isle of Wight Coast Question.

MORE than a year ago applied to the Board of Trade for an order prohibiting removal of beach material from the shores and banks of the Isle of Wight. An inquiry was held last autumn by Commander Frederick, R.N., who subsequently presented a report on the question raised. This document appears to have been consigned to a pigeon-hole quite recently, for the first indication of any action is to be found in an announcement made on Monday that the Board of Trade have written to the Isle of Wight Rural District Council stating that orders would be issued prohibiting the removal of shingle and ballast from the shores and banks of the island between Shanklin head and the southern boundary of Old Sandown, and from a small bay at Freshwater-gate. A period of twelve months can be allotted to the consideration of a single resolution in the Board of Trade offices, and it is a truly idealistic existence for those who have a constitutional aversion to work and worry. Official labour would be still further reduced if, in cases like the present, the Inspector were authorized to make the necessary order immediately on the conclusion of his inquiry for greater advantage, from the standpoint of the public, would be prompt prohibition of the indefensible practice of removing beach material from places where it forms the best protection against inroads by the sea. But existing inertia of the Board of Trade might be brought into useful operation if an Act of Parliament were passed making the removal of beach material illegal along the whole coast-line, except by a special authority from the Board issued after the holding of an inquiry. Reverting to the case of the Isle of Wight, it is satisfactory to note that the local authorities will no longer be allowed to assist the sea in its attack to break through Freshwater-gate into the valley of the Yar. We are glad to observe that the Rural District Council have actually nerved themselves to undertake the consideration of the Report from the County Surveyor, and recommends the raising of the high water mark along the shore at Freshwater-gate.

construction of a concrete apron to the sea at bay. Whether the Council will take any action after their consideration," we cannot say, but they do not the sea certainly will.

A CURIOUS contention was raised by the Metropolitan Electric Supply Co., Ltd., week in the Law Courts, and one which, if successful, would have created an uncertainty in the powers of companies carrying on undertakings under statutory powers. The company was incorporated under the Companies Acts 1887, and possesses general powers to acquire land, erect electric plant, and produce and supply electric energy. In 1889 the company, under the Metropolitan Electric Lighting Act, became "undertakers" within the meaning of the Act to supply certain metropolitan areas, which are limited areas defined in the Act, and various orders were made under it. In 1898, owing to lack of powers by Act of Parliament were defined for erecting generating stations outside the area for supplying the area, these were erected at Willesden. Subsequently the company supplied the London and North-Western Railway with electric current outside the statutory powers and the Attorney-General, at the instance of the Willesden Urban District Council, sought to restrain them by injunction. The contention of the company was that under their Memorandum of Association they possessed general powers which were only limited by the Act of Parliament as regards the specified areas and their neighbourhood; but the Council held that as long as they were carrying the undertaking under their statutory powers they were restrained from supplying electricity outside the statutory areas. In these days when companies under statutory powers work as monopolies of a public nature, it is impossible to imagine the confusion which would arise had the defendants succeeded in their contention.

THE case of Millard v. Balby, with-Hexthorpe Urban District Council, commented on by us in our issue for March 12 has come before the Court of Appeal, and the decision of the Divisional Court has been reversed. The facts may be recalled. A certain street, being a highway repairable by the proprietors at large, required paving and was laid. On June 8, 1899, the District Council, acting under the Public Health Act, served notices on the proprietors requiring the work to be done; but as the notices were not complied with the Council exerted their powers of stopping the work themselves. The work was completed December 4, 1901, and the apportionment of the expenses not served under section 257 until November 24, 1902. Millard was the owner of certain premises when the notice was served, and also when the work was completed, but on November 20, 1902, and between the time of completion of the work and the service of the apportionment he sold the premises. A demand for payment under section 257 was made on Millard, May 20, but he contended he was not liable to

pay, since he was not the owner both at the time when the work was completed and at the time when the demand was made. The Divisional Court, feeling itself bound by an old decision, *Reg. v. Swindon Local Board*, decided in 1879, upheld this contention, but the Court of Appeal have reversed this decision, and have held that section 257 clearly defines the person liable to be the person "who is the owner of such premises when the work is completed." The Court pointed out that in the case of *Reg. v. Swindon Local Board* the person on whom the demand was made had ceased to be the owner at the time the work was completed, and they gave no decision on a case where such were the circumstances. The decision obviates an injustice which we have before pointed out would otherwise arise. The purchaser of a house which he buys, because he finds it abutting on a street properly paved and drained, might be saddled with a liability which he had no means of ascertaining, and which arose solely from his predecessor's default.

In May, 1902, negotiations "The Armoury," were opened between the Candia. Cretan and Italian Governments with a view to preserving the so-called "Armoury" at Candia, the most important Venetian monument of the Renaissance period in Crete. The Italians sent over an engineer and submitted a scheme of renovation, and also took steps to aid the Cretan Government financially in the undertaking. The latter, however, abandoned the scheme, ostensibly because of its cost, and put the matter into the hands of a Greek engineer, whose first step was to gut the entire building, leaving the walls (not over strong before) in a rather hazardous state. The work, however, except for covering the building with scaffolding, was subsequently abandoned altogether; and recently the Minister of Public Instruction in Crete ordered the upper story of the building to be demolished within 48 hours—which has accordingly been done. The story is recorded in the *Gazetta di Venezia*, and this barbarous proceeding has aroused indignant protests in the Italian press. It is hoped that the Italian Government will take the matter up. A small view of the building was given in a plate in our issue of February 16, 1901, from which it will be seen that the upper story (the most important part in an architectural sense) was an extremely graceful piece of Renaissance architecture. No words can be too strong in condemnation of such a piece of vandalism.

At the annual meeting of the British School at Athens, on the 27th ult., Sir R. Finlay, who occupied the chair, commented (as others have done before him) on the historical value of studies of the remains of Greek architecture and other arts, in assisting us to realise the facts of Greek history and the nature and aspirations of the Greek mind, to a great extent illustrated for us in literature, to which the knowledge and study of art is, however, a most important assistance. Literature gives us the thoughts of the Greeks

of the classic age, but in architecture and vases and gold work we seem to be in even closer touch with them; we can handle their very handiwork; and familiarity with the remains and the sites of important buildings throws a new light on literary testimony in regard to the period. All this has been said before; but seeing that the British School at Athens needs more public support it is well to repeat and enforce an argument which every educated person, whether an archaeologist or not, can understand and appreciate. In regard to all that has been said, on this and other occasions, about the recent discoveries of a great civilisation much older than the Athenian, we would observe that these discoveries ought in no way to lessen our estimate of the greatness of the Athenian period in art. We have found art, of a kind, where we once believed there was but barbarism; but has anything been discovered that can really compare with the creations of what Tennyson called "The supreme Caucasian mind"? We, at all events, have seen no evidence of it.

As we have before mentioned, a memorial to Mr. Penrose has been in process of formation at Athens, in the shape of a library, to be called the Penrose Library, attached to and forming part of the Students' Hostel in connexion with the British School at Athens. The new building, of which Mr. Heaton Conyn is the architect, is now complete except the interior finish and fittings, which are at present under consideration. The total cost, it is expected, will not exceed 1,150*l.* (building work is cheap in Athens), of which the greater part has been subscribed and collected; but 150*l.* has still to be raised to open the building free of debt. Those of our readers who are desirous to contribute to a memorial to Mr. Penrose, to whom architects and students of architecture are so much indebted, are invited to send their subscriptions to Mr. G. A. Macmillan, Martin-street, Leicester-square, or to the account of the "Penrose Memorial Fund" at the London and County Banking Company, Henrietta-street, Covent Garden.

IN transferring its headquarters to the more commodious premises of the Royal Architectural Museum, Westminster, it was generally anticipated that the Architectural Association would largely develop its influence and take a stronger position as the premier educational body for architects in this country. That this is in process of realisation may be inferred from the excellent display of students' work which constituted one of the subjects of interest at the annual conversazione on October 27, the first social function held in the new buildings. Some 600 guests, amongst whom were numbered many of the more eminent members of the profession, were received by the President, Mr. E. Guy Dawber, and Mrs. Dawber, and the

"Nor these alone: but every legend fair
Which the supreme Caucasian mind
Carved out of Nature for itself, was there,
Not less than life, design'd."

The Palace of Art.

scene—which was enhanced by some tasteful decorations—was one of great animation, and proved conclusively that the Association is a healthy, progressive institution. As is well known, the premises have undergone considerable alteration and adaptation to the dual working requirements, and it is further interesting to observe that they are equally fitted for the entertainment of a large gathering of this nature, although the unexpected numbers taxed the ingenuity of the cloak-room attendants. A small collection of water-colour drawings by architects claimed much attention. Works of students in the evening school also were prominent, and a strong show of drawings made in the day-school showed the comprehensive nature of the aims of the Committee. We understand that the day-school, having reached its fourth year, is now firmly established and found to be a great success. The exhibits of works in handicrafts by various firms took the form of general advertisement rather than of objects of instruction. The specimens of domestic furniture, however, were free from this objection, having considerable interest in design and execution. The occasion synchronised with the completion of the re-arrangement of the original collection of casts, so that the Museum is now reopened to the public. The arrangement of the central hall with its two tiers of galleries proved very effective for an occasion of this kind.

At Messrs. Dowdeswell's Gallery is a collection of "Old English Gardens" water-colour drawings by a new and (we are glad to hear) a young artist, Miss Beatrice Parsons, which, as a first exhibition, may be considered to be remarkable. These are water-colours showing the most conscientious and careful execution, without any hardness, and a most delicate feeling for colour and aerial effect; and considering how often one has been invited, of late years, to admire drawings which are mere splashes of effect with no recognisable detail, it is a pleasure to come across a new artist who seems to recognise that accuracy and finish of representation are qualities worth cultivating. The general excellence of the drawings is so well maintained that it is difficult to select special examples; but among those which we should class among the best are "A January Moonrise, Golder's Hill" (4; the moon is rather too large); "A Plum Orchard in Cuckoo Time" (28), with a shimmer of light about it; "Morning after Rain, Sedgwick Park" (31), shewing a curious kind of fort of clipped tree masses flanking the edge of the pond; "Rockingham Castle" (32) and "Under the Yew-trees, Rockingham Castle" (34); "Irises, Sedgwick" (39), a remarkable bit of composition; "Woodside, Chenies—L'Allegro" (43) and "Woodside, Chenies—Il Penseroso" (46), two treatments of wooded scenes which answer well to the suggestive titles given them. Miss Parsons does not at present do much with figures; if she can treat figures in her landscapes with the same delicacy and finish as in the details of her flowers and birds, she may become a second Mrs. Allingham.

MR. ABBEY'S picture of the King's Coronation, which is on view at the Hanover Gallery, in New Bond-street (but under the auspices of Messrs. Agnew & Sons), has received the praise usually given in the general press to pictures of this class, which it is regarded as an act of loyalty to admire. To those who "look upon it with considerate eyes" it can hardly be reckoned as one of Mr. Abbey's successes; perhaps it was hardly possible that it could be, seeing the extreme difficulty of combining a number of individual portraits into a picture which shall be a comprehensive whole. There is a fine colour effect and a great deal of excellent painting of faces and of the rich detail of the dresses, but the artist has somehow got wrong in the perspective effect of the scene. The King was actually seated much more in an open space than appears here, where his throne seems to be close up to one of the piers (if we remember right, the thrones for the King and Queen were close together on each side of the axial line of the building); and some of the principal figures seem to have got out of plane; that of the Archbishop of Canterbury, about to place the crown on the King's head, does not look as if standing in line with the King at all. The sloping line of the spectators in the transept gallery is too steep—the effect of perspective would be to make it appear less steep than reality, not more so, as the lines are receding from the eye. The result of this is that the space looks cramped, and the picture does not convey the true impression of the scene as a whole. Perhaps this drawback is almost inevitable in a picture which must necessarily have been painted piecemeal, so to speak; the total effect had to be sacrificed to the necessity for individual portraits, and it must have been very difficult in such a case to keep a grasp on the main lines of the composition. After all, it is hardly the kind of work to employ an artist like Mr. Abbey on. It is possible that an inferior painter, with some special experience in internal perspective, would have produced a more correct picture of the scene.

THE Winter Exhibition at Messrs. Tooth & Sons' Gallery is worth a visit if only to see Troyon's "Le Ruisseau" (63), the most beautiful and complete work by Troyon we have ever seen. On either side hang two beautiful small Corots. Bouguereau's "Ora pro Nobis" (67), which was in the Academy, is to be seen here again; it is curious that a picture with which it is impossible to find a fault should yet be so totally uninteresting. M. Cavé's "Innocence" (96) is an attempt to do Bouguereau at second hand. Mr. David Farquharson's "Dartmoor" (95) is a really fine landscape; and Mr. Peter Graham's "Down to the Stream" (70) one of the best of his works of that type. Some small pictures crowded with figures—church festivals and other functions, by M. Garcia Y. Ramos, are very clever and worth attention. Mr. Adrian Stokes, in "Autumn" (101), repeats a combination of colour which we have seen in other recent productions of his, and

M. Lhermitte (103) shows us how to use free and broadly-treated landscape with Raffaelli colours; it is a fine landscape but looks like a pastel, and has not force and depth of tone of oil paint. The small room contains a collection of water-colours of some variety and interest; old and new productions. Among the latter M. Groenowegen's small landscape and cattle scenes are very good. The collection includes works by Cox, Chevillier, W. Hunt, G. Fr. Duncan, Sutton Palmer, Mr. The Waite, and other well-known water-colour artists, living and dead.

THE central point of interest at Mr. Maclean's Gallery is a landscape by M. L. Pignies, not a large but a very good one in the painter's most typical style of composition—silvery distance, central area of water, and framework of foreground trees. A beautiful landscape by Cox and a small one by Diaz, are among other attractions of the gallery. Mr. Luke Fildes is a life-size figure entitled "Lydia Languish," but which cannot accept as representing Sheridan Lydia; and we are surprised by the apparition of a large painting by Bill Poster, "Strasbourg," an architectural scene treated on a large scale and of great breadth of style; showing, if this artist could, when so inclined, produce something very different from the prettily finished little drawings which were so popular in his lifetime.

ONE of the rooms at the Leicester Galleries is occupied by a collection of water-colours by Mrs. Stanhope Forbes, under the general title "Model Children and Other People." All these are inscribed with artistic vitality, though we do not always sympathise with the style; for instance, the rather conventional treatment of landscape in some of the "May Evening" (35) among others, which gives one the idea of having been painted with a view to reproduction in chromo-lithography. A good number of the figure subjects, too, have a suggestion about them; strong colour in flat tints and very little effect of distance; one called "The Book" with the hanging forming vertical line behind the seated figure, is practically a piece of wall decoration. But there are most poetic suggestions in many of these slightly executed combination figures and landscape, such as "Home Field" (14), "The Mill Street" "On the Sea-wall" (25), where the effect of wind is delightfully conveyed, and "By the Light of the Moon" (27) where there is a moon that really seems to shine with a mild radiance.

ARCHITECTURAL ASSOCIATION CAMERA CLUB. Mr. Chas. B. Howdill's paper on "Photography" will be read on November instead of November 8, as previously notified. This paper will be of special interest to those studying colour decoration of buildings. STORAGE OF TIMBER IN LONDON.—It is reported at the meeting of Fulham B.C. Council on Wednesday that, in reply to an inquiry from the Law and Parliamentary Committee, a letter had been received from the London County Council stating the question of the necessity for obtaining powers with regard to the storage of timber under consideration.

LETTER FROM PARIS.

The venerable M. Guillaume has now resigned his position as Director of the French School at Rome, his great age rendering him unable any longer to fulfil the duties of the office, which is at present vacant. He has not been much competition for it, persons most prominent as possible successors to M. Guillaume being M. Carolus-Duran, M. Saint-Saëns, and M. Pascal. One unexpected candidature is that of M. Dard, the painter, which has been received with surprise owing to his recent eccentricities of art, and a supposed leaning towards the impressionist School and the Salon d'Automne. He is, however, a real artist with perfect technique and faultless as to drawing; he is an old Prix de Rome man, and may perhaps have a disposition to return to his former principles and practice. His candidature there is not, as some appear to think, a paradox; it would probably make a very good Director, he is still young enough to be able to take an active part in assisting and directing the work of the students.

The ruins of the Exhibition of 1900 are, to some extent, still standing, and the Champs-Élysées and the river banks still encumbered with its wreckage; and yet people are already talking of the next Universal Exhibition, the subject being discussed even in the higher circles of government. If Parliament, with which the final decision will rest, does give its approval to the idea (the advantage of which seems doubtful), it would be in celebration of the fiftieth year of the Third Republic. The same site is already discussed, and it is supposed that it would neither be the Champs-Élysées nor the Cours la Reine, but the space now occupied by the fortifications, which it is supposed will at all events have disappeared in the course of ten or fifteen years from now. There is an immense zone of ground from the north to the north of Paris, only a portion of which will be reserved for building land. This course all in the air at present, but a great many interests are concerned in it, and the subject is being already considered in official quarters.

The scheme really comes about, it may be said, as events are promised that, if the future exhibition is a long way from the centre of Paris, it will be much better furnished with means of transport and access than its predecessors, for by that time metropolitan railways will have spread its network all over Paris. The 3rd Line, though some of the stations are not quite finished, has been in operation for some days, between the Avenue de la République and Père Lachaise. It is already found to be a great public convenience, and will become still more so if a branch line should be established between the Bourse Station and that of the 1st Line at the Palais Royal.

Schemes for new lines have now been submitted for approval. The most important of these is the "Circulaire Intérieure," which would do the same duty for the centre of Paris as is done by the "Grande Circulaire" for the outlying districts, though a portion only of the latter is at present in operation. The new circle will start from the Place de la Concorde, reach the Opéra by way of the Rue de la Harpe, and thence follow the line of the Grande Rue towards the Place de la Bastille; descending thence by the line of the Avenue Morland passing to the left bank opposite the Arsenal. From this point, after skirting the Jardin des Plantes and the Halle aux Vins, it will follow the line of the Boulevard St. Germain, the rue de la Harpe, the Université, and the Esplanade des Invalides, rejoining the Place de la Concorde after a distance of rather more than 12 kilometres. The cost is estimated at 45 million francs.

The second proposed new line under consideration, 11 kilometres in length, is to run from the Porte de Montreuil to the Place d'Italie, in order to put the inhabitants of the twelfth and thirteenth arrondissements in direct communication with the centre of Paris. The cost of this line is estimated at 40 million francs. The third proposed line, only 3 kilometres long and to cost 8 million francs, would run from the church of St. Augustin to the Opéra. The fourth, 4 kilometres in length, and costing 12 million francs, would run from the Opéra to the Place des Terres. Like the others, it would be entirely in tunnel.

In this connexion, it may be mentioned that a curious piece of work is in progress at the Gare d'Orléans, the object of which is to raise the high-level portion of the metropolitan

railway on the left bank of the river across two blocks of houses and the large hall of the Gare d'Austerlitz. The crossing will be made in an oblique line at a height of 5 to 6 metres; and the railway, still at high level, will traverse the quay to rejoin the right bank by means of a new bridge which is being built above the Pont d'Austerlitz.

These lines will be of unquestionable utility; nevertheless, there are strong protests against them in the commercial world, which is apprehensive of a long duration of work, disturbing the street traffic and interrupting business, and maintains that the public requirements are already sufficiently served by Line 3, which is almost parallel between the Place de l'Opéra and the Place de la République.

The Musée des Arts Décoratifs has organised in the Pavillon Marsan an interesting exhibition of the gifts and legacies which it has received since the beginning of the year. These include the pictures and enamels of Claudius Popelin left by the Princess Mathilde; the curious collection of faience given by M. Fitz-Henry; the collection of Chinese cloisonné enamel of M. Rochard; the velvets and embroideries of the XVth and XVIIth centuries given by M. Boissy; the Japanese ceramics of M. Hayashi; furniture of the Louis Seize and Empire periods given by Mademoiselle Fournier; and the French and Flemish tapestries given by M. Maciet. There is little doubt also that to the Musée des Arts Décoratifs will ultimately come the great collection left to the City of Paris by M. Peyre, consisting of wood carving, tapestry, furniture, and pictures.

The question of the copyright in the works of painters, sculptors, and architects will shortly come before Parliament, which will be asked to pass a law giving to such artists a profit on the successive sales of their works. This will be, in fact, the application to works of art of a principle which has long been recognised in France in regard to literary and dramatic work.

M. Tony Robert-Fleury, the President of the Société des Artistes Français, is occupied, in conjunction with the Department of l'Assistance Publique, in an endeavour to establish in Paris a "maison de retraite" for artists who are old, infirm, or without resources. The Société can dispose already of a fund of 600,000 francs for this purpose, added to which is a legacy for the same purpose of 400,000 francs, making a total of a million. With this sum it is expected that the building may before long be carried out and opened, in the first instance, for twenty pensioners.

The Committee formed to erect a monument in Paris to Waldeck Rousseau, has selected M. Marquette as sculptor and M. Rives as architect, to design and carry out the work. The monument will be erected in the "jardin réservé" of the Tuileries, near the roadway which connects the Pont Royal with the Rue de Rivoli.

A School of Arts and Industries is to be formed at Paris. The building will stand in the Boulevard de l'Hôpital, on the site of the former abattoirs of Villejuif. The cost is estimated at 6 million francs.

The death is announced, at the age of 50, of the painter Léon Gustave Ravanne, who had made a special study of marine subjects. He was a pupil of M. Bonnat and M. Busson, and had obtained medals at several Salons, as well as a silver medal in the Exhibition of 1900. He was an artist of great talent, and exhibited at every Salon works which were highly appreciated.

Mme. Paul Jullierat, who was the oldest French painter, has just died at the age of 98. She was a pupil of Delaroche, and exhibited for the first time in the Salon of 1833. She obtained medals in the Salons of 1834 and 1836, and a "première médaille" in that of 1841. She had for a long time past ceased to exhibit.

The death is announced, at the age of 40, of M. Paul Amédée Barigny, architect, and member of the Société Centrale. He had been a pupil of M. Raulin, at the Ecole des Beaux-Arts, and had carried out a good many business buildings in Paris, as well as villas in the outskirts of the city, more especially at Eshly and Meaux.

MEMORIAL TO JOHN LATIMER, BRISTOL.—A tablet has been placed on the west wall of the north transept of Bristol Cathedral, in memory of John Latimer. Mr. H. Dara Bryan designed the tablet.

EARLY GREEK ART AND THE ELGIN MARBLES.

In connexion with the University Extension Guild, Dr. Emil Reich delivered a lecture at the British Museum on Saturday afternoon on "Early Greek Art as Illustrated by the Elgin Marbles and the Latest Excavations."

Dr. Reich said that, as they knew, the Elgin marbles were part of the Parthenon which Lord Elgin, in the beginning of the XIXth century, brought over to London, very much against the wishes of the Government of the time. They formed part of the most famous temple of all times, for the architecture of the temple in itself was the most perfect piece of work. He wished to speak of both the beauty and the importance of the temple, but it must be remembered that the word "beauty" in our modern times had taken a meaning entirely different from the meaning the Greeks attached to it. The word beauty in our modern times meant largely harmony of lines, but the Greeks did not think beauty consisted only in lines. In fact, they were somewhat adverse to beauty of features, and, like modern Frenchmen, were evidently more impressed by beauty of movement—that was to say, grace. Grace really was beauty in movement, and the great sculptors excelled more in grace than in beauty proper. They could easily find in the pictures, especially of the Venetian school, and the Umbrian school of the age of Raphael himself, lines which were as a whole much more beautiful than any line they found in any of the Greek statues. They had the chryselephantine statue of Minerva, which was in the very interior of the Parthenon, and of which a beautiful replica was at Vienna. This was exceedingly beautiful and powerful, yet it might well be doubted whether some of the pictures of the Renaissance and later on did not make the face and the outline far better than the Greeks had ever done. The Greek aim was a mixture of grace and dignity, and he would add a third quality—repose. What struck one so much in Greek statues was the calm, or, as we call it, serenity. It meant that the nation which felt that realised that what had to be done was done; that they had done the great and the small, and that there had come over them that repose which was only possible in men and women who had brought about a perfect harmony in themselves. In mediæval and the Renaissance and modern times they found in the statues and paintings that which was fascinating, or whatever they liked to call it, but the wonderful serenity which existed in Greek statues, even down to the minor details, was gone, because art stood in so close relation to the very soul of a nation. If that soul was unduly undulating, then, of course, the repose could not be serene and calm. It was in art that the vices and virtues of a nation came out so clearly, and he would be a blind man who would not see that. Of course it took eyes to see, and it would be a wonderful advantage if history were written by artists. They would not care for documents or inscriptions or any other so-called source, but they would simply care for art, and would look into the moving lines and expression and colour, and would say, "What does it mean?" By art he meant not only sculpture in marble, but art generally speaking. It was thus that Greek art gave us the expression of absolute serenity; the impression of people who had gone through fights for 800 or 1,000 years, and finally by vanquishing their enemies had reached that repose and serenity that individual people could reach very rarely. It was this expression of serenity that made Greek art so different from anything we had. He would like to say much about the excavations of Dr. Arthur Evans, a man whom they appreciated very much in England, but far less than he deserved. Dr. Evans went to Crete and found a number of old buildings. Last century it was evident that the really great finds would not be in Greece proper, or even in Asia Minor, but in Crete. It was felt that Crete must have had a civilisation 4,000 if not 5,000 years B.C., but there was a far cry between wish and realisation. Dr. Evans, very largely at his own expense and only very insufficiently helped by contributions, went out to Crete, where also an Italian Commission was working, and they found there the beginnings of Greek art. They had in the publications of Dr. Evans and the Cretan Exploration Fund a very clear idea of what really happened in Crete, at least 3,000

years B.C. He found that what the Frenchman Rabel said was true, viz., that there must have been a civilisation of very great importance long before the historical Greeks, and long before the historical Romans. Long before the foundation of Rome there were in Italy hundreds of towns surrounded by cyclopean walls. At Mycenæ, Knossos, and many other towns in Crete, are these huge square stone walls, and on top of them they saw the brickwork of a later age, and thus they could see the historical sequence. These great walls were evidently built first for defence, but the excavations of Dr. Evans had proved more. He found a palace at Knossos three times as big as the Houses of Parliament in London, with hundreds and thousands of rooms; with great yards and cellars, and—more astonishing—entire streets. Still more astonishing, the buildings had French windows, just as in modern times. But if Dr. Evans came across architecture 6,000 years B.C., he (Dr. Reich) would consider it quite natural; there was no reason not to expect it. Homer spoke of the 100 towns of Crete, but there must have been several hundred, and a high degree of civilisation. It was when we traced Greek history that we could tell where Greek ideas came from. The Greeks found themselves being pressed in by the Great Empires, and as they could not beat their enemies by placing in the field masses of men they had to beat them by intelligence. What happened in the Western portion of Asia in so-called prehistoric times, was being enacted in Eastern Asia at the present time. Japan, an island power, saw herself in danger of being attacked by two great Empires, the Russian and the Chinese, and when she found that she could not hope to defend herself unless she tried to be more civilised, she sent her men to Europe to learn. This process of intellectualism had happened in our own isle, and it was what happened 3,000 or 4,000 years B.C., and more especially 1,000 years B.C., on the western shores of Asia. The Greeks say that they must succumb to their enemies unless they looked to their intellectual development, so that by sheer force of intellect they could beat them down. This gave rise to a greater expression in art. Where there was a greater life there must be art. This was the true origin of Greek art. They did not take it from the Egyptians, for art could not be given. People say, "It all comes from Egypt or Assyria," but the Greeks did not get it from the Egyptians or the Assyrians. They fought for it, and in fighting the powers which make for art were born in them. We had an example of that in Shakespeare. The men who fought the Spaniards never wrote a line of Shakespeare, or at least that theory had not yet been advanced; but it was a certain fact that had it not been for Drake and Frobisher and others beating the Spaniards, and arousing the powers in the nation, there would have been no Shakespeare. People said, "Here is a column or pillar; it is just like one in Egypt," but that did not prove that the Greeks took it from the Egyptians. The Italians never took Gothic architecture, because they did not want it, for the same reason there was no Gothic architecture in Eastern Germany. Art could not be given any more than love. There must be powers aroused in one which produced it. They could not go to a firm like Whiteley's and say, "Give me 2*l.* worth of artistic capacity." In the last 200 years all the great musicians of the world had given concerts in England, but where was the English Beethoven? The fact was that they did not want him, because the powers which made for music had been sterilised in England. There must be hundreds of men in England in whom was the genius of Beethoven [? Ed.], but their forces were driven in other directions. The excavations of Crete showed clearly that Greek art was really of their own growth. It was stimulated by the fighting against great empires—it was war and conflict which was the father of all nations. These cyclopean walls indicated that there must have been fighting of the most gigantic kind, and that was what made the art. Evidently for 1,500 years before the Parthenon was built, the Greeks had prepared themselves, and it was from 490 to 449 B.C. that the Greeks, in a series of most wonderful engagements, in which their intellect did more than their physical vigour, defeated the biggest Empire in the world, and those who were left felt that they had reached the summit of their life, and the great and final expression of that

feeling was the Parthenon. Could we wonder that the Greeks felt it, for did not we feel it after so many years? The finest architecture of the Middle Ages and of modern times might give them a shiver; they felt after a time there was something not quite complete, but the Parthenon never gave one a shiver; the real beauty of the thing entered one's soul, and became a principle of one's life. One felt that he had not only seen a fine thing but that he had seen the whole of human life—the whole of what they called human life in marble. It was totally different from anything else. They saw that everything most beautiful, except the statue of Minerva, was outside. In a Christian or Mahomedan church the outside was only the introduction—the real church was inside. It was in the inside they saw the wonderful architecture and found the beautiful paintings, and heard the fine music, and finally assisted at the great service, which more or less filled them. With the Parthenon everything was outside; the wonderful columns, metopes, pediments, and frieze. The movement of their souls and the whole change of the inner man was not given inside, because no one ever entered. But the temple could be seen from an enormous distance, and the people were constantly in the presence of this expression of the greatest and deepest religious ideas. The man who in modern times was Schopenhauer, and he gave the idea very simply that a column, for instance, was meant to express gravitation, and that anything which went against this principle, such as a column very thin in the middle, was silly. It must express support in the first place. In the modern church they found that idea of support exaggerated; in Gothic churches they found the buttresses very elaborate, but in the Parthenon they found two rows of columns—that was all. Each column was the same—each was a simple Doric column. The architrave was as simple as it could be. It plainly said, "I am here to support this big building; that is all I have to do." But there was one thing which gave them the idea that the columns were more than a support. It had long been noted that not only did these columns swell in the middle but they twist round, and gave the column a sort of human force—they saw the effort of the column to support the building. It did not strike them like the buttresses in Gothic architecture. He was not opposed to Gothic architecture, and when they saw the work on the buttresses of St. Ouen, at Rouen, for instance, they were overwhelmed with the beauty; but if their eyes were accustomed to Greek architecture they asked, "What does it all mean?" It meant the support of a very high, thin wall, and it was too much. The Greeks did not do it, but they had the outside as simple and chaste as possible. They did not try and take the infinite into their pocket, but they said, "Here is our earth, we have done what we have; we have reached our maturity." And so instead of attempting to go up into the infinite sky they gave an expression of calm repose. The Greeks were profoundly religious; we are religious on the seventh day, but the Greeks were religious every day of the week. And so in their temple their ideas of religion were outside, and shone down on Athens always. Nowadays, our religion being rather of an intermittent kind, we wanted music; we wanted an intense shiver and at once. The Greeks did not want anything of that, they were intensely attracted by music, but they would not have it as part of their services. They wanted sculpture, which was more permanent, more intense—was always there. The Parthenon was erected in honour of Minerva, the goddess of war and wisdom, of virginity and holiness, of irreproachable severity, and they might have expected the great temple to have reminded everyone of the great contest with the Persians. But there was not a trace of that. The temple must have cost millions of money, but it never entered their minds to have the slightest allusion to any of their immortal fights. Their idea was to show that they believed the gods helped them, and were willing to help them in the future. There were any number of figures round the frieze, but no representation of any of their heroes. The feeling left was that the Greeks had found the art of proportion. They saw the procession of the Panathenæic festival portrayed, and it was really a story of man's life. It was not only a pageant but told everything that happened. That procession was not only a

spectacle, but was a lesson in art, politics, and everything. The Parthenon only the same idea expressed in marble if ever the time came when the world had had its Parthenon, that simple old would be the model.

THE HELLENIC SOCIETY.

The first meeting of the present of the Hellenic Society was held at the room of the Society of Antiquaries on Tuesday afternoon. The meeting, which was well attended, was devoted to a summary by Dr. Arthur of his last season's work at Knossos. The following *resumé* of his address from *Times* report:—

"Dr. Evans said that on the palace site this year's excavations had thrown much light on the stratigraphy of the so-called 'Minoan' constructions dating from the Neolithic period onwards. In the wing of the later palace the original plan was clearly distinguished from the scheme, which was shown to be the result of subsequent remodelling. Fresh storerooms belonging to its first period—found in 1903 containing the faience figure of a snake goddess, but less rich in relics found to extend north of the others beyond the later stepped portico which here opened to the central court. A whole line of gypsum walling facing this court could be made out, a little within the late facade. This original facade was seen to have been incorporated in the later construction partly to have been broken through by the west wall of the palace itself. The adjoining magazines belonged to the earlier work, but the entrances to the magazines found to have been altered. Originally they were provided with comparatively small doors appropriate to the valuable contents of the cists along their floors. The entrances were widened, the cists reduced to mere shallow cavities, and the whole fitted for the reception of huge oil jars. From the official deposit of some of these cists belong to the second period of the later palace brought out a variety of painted stucco ornaments which had fallen here from a higher level above. Among these were illustrations of a hull ring, together with other frescoes, larger than the 'miniature' paintings in 1900, showing part of the facade of a shrine, with the 'fetish' double-axe into its columns. Dr. Evans also exhibited a scheme devised by him for the arrangement of the scattered fragments of the earlier covered miniature frescoes as part of ceiling designs. Two panels were thus reproduced. M. Gillieron under his direction, one of a small temple and halls on either side of ladies seated or standing in the foreground, and the other of a group of men behind. The other of the walled enclosures with trees and similar figures overlooking a court where gaily-dressed women were engaged in a mazy dance. Interesting fragments had also been discovered of the painted reliefs exhibiting parts of a figure, with a *fleur-de-lys* crown, and the admitted the restoration of the entire of what was not improbably one of the kings of Knossos. The centre of the wall was found to be adorned with peacocks." A clay sealing of still earlier date supplied appeared to be an actual portrait of a monarch associated with his son, but in the head was crownless. A section cut in the pavement of the west court had laid remarkably complete evidence as to the fixation and comparative chronology of characteristic stages of Minoan culture preceded the construction of the later palace. The foundation of the later palace was to have been posterior to the great Minoan age of polychrome-potted second period, as appeared from E. associations, did not come down later than about 1500 B.C., but there were now to be six distinct periods of culture that set the initial stage of the later palace in the latest Neolithic deposit. Below this age Neolithic stratum which was itself placed on the virgin rock, attained a depth of from 6 to 8 metres. On the western border of the palace the total depth of the human occupation was from 12 to 14 metres. A Minoan pavement was opened out leading directly west of the 'theatral area' discovered last year, and this, towards the close of the present excavation,

...to light what appeared to be remains of the Royal arsenal. A large hoard of clay tablets was found here relating to chariots, arms, and near one of these—enumerating of over 800 arrows—lay the remains of two well-sealed chests containing the bronze-headed arrows themselves. A principal work of the year was the exploration of an extensive series dating from the last days of the palace to the immediately succeeding period. Over 100 tombs were opened, containing bronze vessels, arms, jewellery, and other typically Mycenaean remains. Of still greater interest was the discovery of what appears to have been a mausoleum occupying a commanding position overlooking land and sea. It was built on a different plan from those of Mycenaean times, the principal chamber being square with a flat roof. Most of the metal objects had been abstracted in ancient times, but magnificent examples in the later palace style were found, together with Egyptian alabastra of the beginning of the XVIIIth Dynasty."

Plans and sections of the so-called "mausoleum" (we fear we cannot accept all these conclusions as certain and proven) had been made by Theodore Fyfe, and were exhibited on the occasion along with a section of the Treasury of the temple, in order to compare the two examples of the use of the arch in horizontal courses. The objects of which illustrations were given on the screen the most interesting and valuable from the artistic point of view were those of the decorated vases of what is now called the "Middle Minoan period"; two of which were equal in design to any of the best classic Greek work of the same period. We think the interest, or at all events the artistic value, of the figure-painting and the vase found at Knossos has been a good deal exaggerated.

The succeeding meetings of the Hellenic Society are fixed for February 21, May 9, and July 27, 1905.

THE POWELL WOOD PROCESS.

Yesterday last a demonstration was given at the office of a new method of treating timber which is now being introduced by the Powell Process Syndicate. The procedure may be thus briefly described:—The timber for treatment is first placed on trucks packed in such a manner that the surfaces are separated one from the other. These trucks are then run along rails into a cylinder, long by 6 ft. 6 in. diameter, furnished at one end with a hinged cast-iron door, which can be secured so as to make a water-tight joint, and fitted inside with a network of pipes for heating by steam and cooled by water. When the trucks have been lowered into the cylinder they are fastened down and the timber from floating in the liquid, which is added after the door has been closed. The liquid employed is an aqueous solution of sugar molasses for the heavier descriptions of timber, and of raw sugar for hard woods. Open tanks are provided in the vicinity of the cylinder for the different qualities of solution suitable for each class of timber for treatment, these being connected with the cylinder by pipes each controlled by valves. Steam and water pipes are connected with the coils of the cylinder, and two centrifugal pumps are provided, one for dealing with the saccharine solution and the other for circulating cold water through the coils. The timber is first immersed in the solution by the admission of steam to the pipes mentioned. This has the effect of forcing out air contained within the wood, and at the same time it serves to coagulate the mucous constituents of the sap. It is claimed by the patentee that timber has so great an affinity for saccharine matter that it soaks in a solution of sugar the air contained in it is given up far more readily than when immersed in water only. It follows as a matter of course that the voids left by the displacement of air must be occupied by the solution, from which the water is evaporated in the subsequent process of drying. This process is performed in a series of three drying-rooms adjacent to the cylinder. All the rooms are heated by means of a 48-in. fan through a network of special construction, and in connection with which hot air ducts and cold air ducts are arranged so that the temperature of each chamber may be regulated at will to suit the nature of the wood to be dried. A 36-in. fan is provided for each chamber to make the circula-

tion of air thoroughly efficient. After the process of drying is completed, a current of cold air is passed through the chamber to cool down the material. It should be observed that neither pressure nor vacuum is necessary for the method here briefly outlined, and, as a matter of fact, the employment of a closed cylinder has been shown by practical experience to be unnecessary, for the results following treatment in an open tank are said to be perfectly satisfactory.

The feature distinguishing the process from others of somewhat kindred character is to be found in the employment of sugar in place of creosote or mineral salts. We were informed by Mr. Powell, the patentee, at the close of the demonstration, that he first discovered the value of sugar as an impregnating material when conducting some investigations into the causes and prevention of dry rot. Observation showed him that this particular form of decay was very unusual in sugar refineries and factories, and he was led to make experiments which ultimately resulted in the elaboration of the process described in these notes. An important claim made is that the newer the timber the better it is for treatment, and it is said that timber felled in the forest may be made ready for commercial use within a fortnight, being rendered stronger, firmer, tougher, less porous, and more durable than in its natural state, whether seasoned naturally or artificially. It is obvious that we cannot, after a mere inspection, personally vouch for all statements made in favour of any system of the kind, but judging from the examination of various specimens of treated timber, we can substantiate in a general way some of the claims put forward. For many purposes we think the addition of a vegetable product such as sugar is likely to conduce to more thorough impregnation than the similar employment of a mineral salt, but so far as concerns resistance to fire, the latter is certain to be more efficacious, and in point of fact non-flammability is not claimed by the patentee as one of the benefits to be derived from the adoption of the process. So far as relates to the question of penetrability by water, it is scarcely to be expected that a substance of such solubility as sugar can offer the same resistance as creosote and other insoluble products, unless some chemical action altering the character of the material takes place during the course of the process.

BETHLEHEM HOSPITAL, SOUTHWARK.

In order to provide a much-needed open space for recreation ground in that part of South London, a proposal is under consideration for acquiring the site and grounds of Bethlehem Hospital, between eleven and twelve acres, in St. George's Fields. The land comprises the gardens of the former Dog and Duck tavern, taken in 1799 for the School for the Indigent Blind, and three acres appertaining to the House of Occupations (a branch of Bridewell). It formed part of the Bridge House Estates of the Corporation of the City of London, with whom the hospital governors exchanged in 1810 the site, about two-and-a-half acres, of the hospital in Moorfields just outside the City Wall, where is now Finsbury Circus. Contributions to the building fund were made by the Government (in respect of criminal lunatics), the Corporation, the City companies, and private individuals. A Parliamentary inquiry held in 1815 resulted in the adoption of a humane treatment of the insane. The new hospital was begun in April, 1812, and completed in August, 1815, for 184 patients, and 66 in the criminal cells, at a cost of 122,572l. 8s., James Lewis being superintending architect, and Repton assistant architect, of the work. Lewis had been appointed surveyor to the Bridewell and Bethlehem Hospitals in 1793; in the competition for the new hospital in Southwark the first and second premiums were awarded to Joseph Henry Good and W. C. Lochner jointly, and John Adey Repton, respectively. It seems that the building erected by Lewis embodies the designs of those three architects. It comprises the middle order with hexastyle Ionic portico, and parts of the east and west wings, and of the wings extending southwards; having a front 569 ft. long, and an altitude, disposed into four galleries or floors, of 60 ft. to the parapet, the wings being 45 ft. in depth. Some additions were made by Lewis's successor, Philip Hardwick, R.A., and afterwards by Sydney Smirke, R.A., who in 1838 was appointed

architect to the governors. To Smirke are due the cupola (1844), which has a diameter of 37 ft., and rises to about 150 ft. above the ground, in place of the former copper-covered dome, the projecting parts of the east and west wings, and the completion (1852-3) of the south wings. The exercise-courts, or "green-yards," were re-arranged, new workshops and other subsidiary buildings were erected, so that in 1868 Smirke had increased the accommodation to receive 376 inmates. The two figures which C. G. Cibber carved in Portland stone for the gate-way of the former hospital, and Bacon restored in 1820—"Εικόνα των εντός χώ λίθος έκτός έχει"—were removed some years since from the hall to the Museum at South Kensington, and thence to the Guildhall Museum; the entrance-gates are shown in Hayley's picture, 1746, at the Foundling Hospital. In the outer face of the wall of the hospital grounds is embedded the carved sign of the Dog and Duck, with the Bridge House Estates device and date "1716."

THE SANITARY INSPECTORS' ASSOCIATION.

The annual meeting of this Association was held on Saturday last week at Carpenters' Hall, London Wall, E.C., Sir James Crichton Brown presiding.

The annual report, read by Mr. Young, stated that in the last year's report attention was called to the progress made towards the securing of one association for the whole of England, to which end the Articles of Association had been so altered as to render them not only acceptable to those associations they desired to become affiliated with, but also at the same time to secure to those who were members of the Incorporated body that they should be in no wise prejudiced by the alterations. At the date of the last annual meeting a copy of the amended articles had been deposited, in accordance with the Companies Acts, at Somerset House. Up to that time no official correspondence had taken place with the outside organisations, but immediately following the meeting referred to correspondence was entered into between the Chairman and the officials of the National Union and the South Wales and Monmouthshire Associations. By the end of November an agreement had been prepared between Mr. Spears and their Chairman for the approval of the Council of both associations, which was subsequently ratified, and formed the basis upon which, coupled with the amended articles, affiliation was to be secured. The object of the agreement was to secure certain rights and privileges to the National Union of Inspectors, and also the Lancashire and Cheshire branch, the area and interest of which would be affected in the event of amalgamations taking place. In December the Chairman attended, at their desire, a meeting of the National Union at Manchester, when the amended articles and agreement were considered and provisionally approved. The members of the Union were subsequently furnished by the secretary with voting circulars, and were asked to vote for or against amalgamation, and also to state their willingness or otherwise to be transferred to membership of the Incorporated Association. In February they adopted the Chairman's reports and the agreement, and conferred with the National Union and the South Wales and Monmouthshire Associations. It was understood that the membership of the National Union exceeded 350, and their financial year ended on March 31, by which time it was hoped arrangements would be sufficiently advanced to enable a large proportion of their members to be elected at the April meeting. Success attended the efforts of the Council of the Association, and, on April 9, 116 members of the National Union were enrolled members of the Association. The South Wales and Monmouthshire Association also unanimously decided in favour of amalgamation under the revised articles. Considerable correspondence had taken place upon the question since that day, and strenuous efforts were made by their South Wales friends to secure, in the words of Mr. Towy Thomas, the first autumn provincial meeting of the Amalgamated Association at Cardiff in August of the present year, but the Council regretted that that was not possible. The Council's report upon that portion of its work would be incomplete were it not to record the fact that as between April and August last there were elected 204 members of the National Union. The total effective membership of

the Association was never so satisfactory as at present. Including those elected at Bourne-mouth, it had approximately 900 members allocated to the six established centres. The South African centre of the Association would most probably commence with a membership of forty inspectors. Continuing, the report referred to the Permanent Tenure of Office Bill. The measure, promoted in 1903 by the British Medical Council to secure permanent tenure and superannuation for medical officers of health and sanitary inspectors, did not, unfortunately, meet with the success which they had anticipated. The Council, however, believed that a large measure of support would attend the efforts to be put forth in connexion with the introduction of the amended Bill into the ensuing session of Parliament. On behalf of the Council, the Chairman and secretary had had interviews with the Parliamentary Committee of the British Medical Council, and their secretary. The Council had approved their action in agreeing to that portion of the Bill relating to superannuation being dropped, so that the measure would, therefore, be for tenure of office alone.

The report was adopted. Other business having been transacted, Sir James Crighton Brown delivered a short address on the position of sanitary inspectors in New South Wales, based on information supplied to him by Professor Andrew Stewart, of Sydney. In Sydney the salaries of those officers ranged from 150*l.* to 400*l.* per annum, but in the smaller towns the salaries were smaller and the duties of the inspectors included rate collecting, &c. The Sanitary Institute of Sydney held examinations at various periods, the first having been held in January of 1901, when fifty-one candidates entered. In connexion with these examinations courses of lectures were held, part of the proceeds of these lectures and examinations being devoted to the acquiring of models, &c. Visits to various interesting works, &c., were arranged, and everything done to evoke an interest in sanitation. He thought that England might learn something from her Colonies, and profit by their experience.

THE VENTILATION OF SEWERS.

In a Report recently circulated the Works Committee of Lewisham Borough Council stated that the ventilation of sewers in the district had received attention from time to time, owing to complaints received from residents as to smells emanating from surface road ventilators. In this connexion they had received the following communication from the Borough Surveyor:—

"The whole question of the ventilation of sewers is surrounded by difficulties, and unfortunately we hold very different opinions as to the best means of dealing with the matter. In many places the surface gratings are closed and columns erected in order to ventilate the sewers, but this, in my opinion, and I have made many tests in connexion with the subject, simply means that the nuisance is removed from the road surface, and that the sewers are very inefficiently ventilated, unless some artificial means of forcing a draught up the columns is adopted. The air which does find its way out of the top of the columns is far more foul than that which is emanated from the surface gratings; this is caused by the more sluggish current which is always found in a deep sewer, and my opinion of columns is that you practically deepen your sewer by the height of your column, that is to say, if a sewer is 10 ft. deep and you erect a 30 ft. column you are practically converting that sewer for the purposes of ventilation, to a sewer 40 ft. deep, and I think that whatever different opinions engineers may hold on the subject of ventilation generally, they are agreed that a deep sewer is more difficult to ventilate than a shallow one. A very good example of this exists in this borough. The old sewer in Stanstead Road averaged about 10 ft. deep, it was in a very defective condition, the gradients were irregular, in places flat, and in other places steep; the bottom, also being defective. This sewer was reconstructed in 1893 at an average depth of about 25 ft. It is one of the best laid sewers in the borough, and is at an even gradient the whole way. During the time the old sewer was in existence we very seldom had complaints of smells from it; since the new sewer was constructed we are continually receiving complaints. Of course there are many ways of inducing an artificial current up the column ventilators, but they are all attended with serious drawbacks. The most common form of inducing a current is by means of heat, but it is a very expensive method and is attended by some danger. If a small jet of gas is burnt in the column and any coal gas leaks into the sewer, which it frequently does, there is very great danger of an explosion. The other method of applying jets of gas are practically adaptations of the Davy lamp, by which the gas is burned inside a wire gauze; but this unfortunately seems to considerably reduce the efficiency of the heating power and also further increases the cost. Another method of inducing a draught is by means of a cow with an Archimedian screw; but this, in my opinion, is a complete failure, and is worse than useless, because the time when sewers most require an artificial means of ventilation is on dull, still days, when there is no wind, and then, of course, the cows do not revolve, and the Archimedian screws practically block the columns and prevent the little ventilation which one might get

without an induced current. I some time ago tried an experiment with a revolving fan fixed in a column, the fan being driven by a jet of water under pressure from the Water Company's main. I utilised the water afterwards by conveying it into a flushing tank, where it flushed the sewers. This was effectual to a certain extent, but it was too expensive to adopt generally. The complaints of smells from sewer ventilators have largely increased since the coming into operation of the London County Council's by-laws as to drainages, which necessitate the use of interceptors to block the house drainage from the sewer; under the old system each house was compelled to have a ventilating pipe from the highest point of the drain, each one of these pipes acted as a ventilator to the sewer and the surface gratings in the road in most cases acted as fresh air inlets; this theory of mine is borne out by the fact that on the St. German's Estate, which has been laid out nearly entirely since interceptors have become compulsory, we have more complaints than from any other part of the borough. This may appear to be somewhat of a contradiction to my condemnation of column ventilators, but the one thing is very different from the other; column ventilators are, as a rule, erected about 100 yds. apart, whereas house ventilators are, of course, erected to each house, and in the 100 yds. there would probably be on the average about twenty-two separate house ventilators, and also with the old system we still had the open surface gratings in the roadway. I would suggest as a partial mitigation of the nuisance that the sewer ventilators should be put much nearer together; at present when sewers are sanctioned we ask for about 100 yds. apart, and also that efforts should be made by combined action of the borough councils to obtain the repeal of the London County Council's by-law with reference to interceptors. I am afraid this would still leave a considerable amount of difficulty, as the majority of the medical officers in London are in favour of interceptors, and will advise their councils against the repeal of this by-law. I should like to point out that although the sewerage is not made compulsory until the passing of the London County Council's by-laws in 1900, many of the boards of works and vestries in the metropolis insisted on their use, whereas in Lewisham we not only do not insist on them, but we advised builders not to use them; and I think that this action has been justified over and over again by the low death-rate in the parish of Lewisham. My idea of an ideal sewer is a trough of the necessary depth to drain adjoining premises, flushed off level with the road surface with a continuous open grating. If such a thing were constructed I firmly believe we should never have a single complaint."

Continuing, the Committee in its Report went on to say that the London County Council in October, 1900, made drainage by-laws under the provisions of Section 202 of the Metropolitan Management Act, 1855. No. 5 of such by-laws provides as follows:—

"Every person who shall erect a new building shall provide in every main drain or other drain of such building which may immediately communicate with any sewer, a suitable and efficient intercepting trap at a point as distant as may be practicable from such building, and as near as may be practicable to the point at which such drain may be connected with the sewer. He shall, except in cases where the means of access to be provided in compliance with the preceding by-law shall give adequate means of access to such trap, provide a separate manhole or other separate means of access to such trap for the purpose of cleansing it."

And this by-law, so far as practicable, is made to apply to the reconstruction of drains as well as to drains of new buildings.

In conclusion, the Committee state they concur with the views expressed by the Borough Surveyor, and have decided to send copies of his communication to the other Metropolitan Borough Councils, and ask them if they would be willing to co-operate in requesting the London County Council to take the necessary steps to repeal the by-law made by them requiring the fixing of intercepting traps.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. J. Williams Benn, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 11,314*l.* for electric light installation and meters; Finsbury Borough Council 9,244*l.* for improvements; and Woolwich Borough Council 16,000*l.* for the erection of municipal buildings.

Thames Steamboat Service.—On the recommendation of the Rivers Committee, the following was agreed to after a long discussion and the defeat of an amendment to refer the matter back to the Committee, on the ground that the lowest tender had not been recommended:—

"That the capital estimate of 297,530*l.*, submitted by the Finance Committee, be approved and that the tender of Messrs. John L. Thorneycroft & Co., Limited, for the supply of ten steamboats at the price of 5,950*l.* per boat, the tender of Messrs. Napier & Miller, Limited, for the supply of ten steamboats at 6,000*l.* per boat, and the tender of the Thames Ironworks, Shipbuilding, Engineering Company, Limited, for the supply of ten steamboats at 6,500*l.* per boat be accepted, subject in each case to the submission of satisfactory working drawings for approval before the work is commenced, and that they be allowed to sublet such portions of the work as are approved by the engineer."

Mr. A. R. Owen was appointed in the Engineer's Department as Manager of the Thames

Steamboat Service, at a salary of 500*l.* annum.

Tramways in Rosebery-avenue.—Upon recommendation of the Highways Committee the sum of 22,500*l.* was voted in connexion with the construction for electrical tramways along Rosebery-avenue.

Main Drainage Extension: A Question of Tenders.—The Main Drainage Committee recommended that the contract for the construction at Plumstead of a portion of the southern outfall sewer should be given to Westminster Construction Company at 8*l.* in preference to the lowest tenderer who to do the work for 68,377*l.** When this recommendation was before the Council a fortnight ago it was referred back to the Committee. The chief engineer's estimate of the cost of this work was 91,727*l.* In making their recommendation the Committee justified their action in passing over the lowest tenderer on the ground that the firm had not yet done work for the Council and the job in question one of exceptional difficulty.

Mr. Torrance now moved for an amendment that the work be given to the lowest tenderer.

Mr. Beachcroft seconded the amendment, which was rejected on a division by 63 to 44.

The recommendation of the Committee was then adopted.

Theatre, Commercial-road.—On the recommendation of the Theatres and Music Committee, plans submitted by Mr. B. of a theatre proposed to be erected at the junction of Commercial-road and Myrtle-road were agreed to. The theatre will have an accommodation for 1,887 persons.

The London Building Act Amendment Bill.—Mr. Radford asked the Chairman of the Building Act Committee as to the present position of the Building Act Amendment Bill introduced by the Council.

Captain Hemphill, Chairman, said the Committee proposed to bring up next week full details of the Bill, and they hope the Council would support the general principle when they were then set forth.

Precautions Against Fire in Underground Electric Railways.—The Fire Brigade Committee reported as follows, the recommendation agreed to:—

"We have had before us a letter from the Metropolitan Railway Department, stating that in order to promoters of underground electric railways requirements in certain matters which will be the officers of the Board when such lines are submitted to the department for inspection, that has included a notification that "efficient fire hose, and fire-prevention appliances are to be provided and mentioned that the Board proposes if the promoters call upon promoters of such lines for inspection, to produce for the information of the Board an expression of opinion on the part of the officer of the Council's Fire Brigade, as to the sufficiency of the provision made in compliance with this notification."

"After careful consideration, we informed that the Council would raise no objection to the proposal, but that it was very desirable that they should make certain demands relating to fire-appliances and issue them to the promoters of the railways. We forwarded certain minimum requirements and recommendations on the subject. These have been embodied in a circular letter issued by the Board to the promoters of tube railways, and they are as follows:—

(a) The following are the minimum requirements as regards fire-appliances, provided the station is of reasonable dimensions:—

(1) A hydrant of the fire brigade pattern fitted at each end of each platform, and a hydrant to be provided with sufficient hose and nozzle to reach the whole length of the platform and of the longest train in use at a particular line.

(2) At least six buckets of water and a sand-bag to be available on each of the service platforms.

(3) An extinguisher to be supplied in each carriage and to each lift.

(4) It is recommended that provision should be made for:—

(1) Some experienced person responsible for the owners of the railways to periodically examine and test the extinguishers, and the owners responsible for the good order of all such appliances and for seeing that the railways are stationed and drilled.

(2) All waste and dirt to be removed daily.

(3) It must be clearly understood that uncrowding in the lifts and carriages is prevented by the owners of the railways keeping the exits in such lifts and carriages will probably prove useless in case of fire.

(4) It should be borne in mind that in the event of fire obtaining any hold in a "tube" railway fire brigade could be practically of no avail, and therefore the railway authorities must rely upon their own resources.

"We are of opinion that, provided the station is of reasonable dimensions only and the trains and stations are constructed in accordance with

* See the full list of tenders on our Tender page.

ments of the Board, dated May, 1904, the appliances mentioned above could be accepted as sufficient if installed efficiently and used promptly by the railway staff. It is of course understood that the question for consideration has relation only to railways connected in accordance with the Board's requirements dated May, 1904. Moreover, the minimum requirements as to fire-appliances set out above relate only to the trains, the platforms, and the booking-offices, and do not extend to that level, and do not of course apply to the booking-offices and other parts of the railway above the line level for which special arrangements could be made.

We have called the special attention of the Board to the question of over-crowding. It is obvious that, however perfect might be the fire-appliances in the places, disaster would probably follow if the gangways were not kept clear so as to admit of the extinguishers being got to work readily and expeditiously. We suggested to the Board that it should make a requirement that the motors should be contained in separate compartments made of non-combustible material, and be underneath carriages, but the Board has replied that its advisers are of opinion that the requirement stated is hardly practicable. We have settled the plan in which the chief officer of the fire brigade should express his opinion as to the sufficiency of the fire-appliances, and this form has been approved by the Board. It is proposed that the requirements and works included in (a) to (d) in the second paragraph of his report shall be set out on the back of the form. We recommend—that the checks taken by the Fire Brigade Committee with regard to the precautions against fire in underground electric railways be approved.

Tramways: Re-building of First Portion of Car-shed at Streatham.—It was agreed, on recommendation of the Highways Committee—(a) That expenditure, on capital outlay, of sums not exceeding 19,280*l.*, in all be authorised, in respect of (i.) the erection of superstructure of the first portion of the tramway in the electrical working of the London County Council Tramways, and (ii.) the execution of paving works, the laying of rails, and the construction of conduits in, and in connection with, the car-shed. (b) That the portion of the first portion of the Streatham car-shed be carried out without the intervention of a contractor; and that the drawings, specification, and estimate of 16,180*l.* be accordingly referred to the Works Committee that purpose. (c) That the paving works, the laying of the rails, and the construction of the conduits required for the first portion of the Streatham car-shed, be carried out by the Council's permanent way staff, under the supervision of the chief officer of tramways.

Housing.—The Housing of the Working Classes Committee reported as follows:—We report that Raleigh-buildings, the third block of dwellings on the Hughes-fields estate, Oxford, are practically completed.

It will be remembered that the site on which the buildings have been erected consists of a plot of land which was acquired under the Hughes-fields scheme, 1885, and appropriated to the Council, with the consent of the Local Government Board, for the purposes of Part III. of the Housing of the Working Classes Act, 1900. The buildings will contain accommodation for 280 persons in 18 tenements of two and three tenements of three rooms, and 8 tenements of four rooms.

Proposed Japanese Exhibition: Holborn to Strand Improvement.—The Improvements Committee recommended that a site bounded by the Strand, the Strand, and Newcastle-street, should be let for temporary purposes until December 29, 1905, at a rental of 7,500*l.* The Committee reported that they had been advised that this would not delay any possible letting of the land for permanent building purposes. In answer to a question by Mr. Sharp, Mr. Davies (Chairman of the Committee), said that the land would be used for the purpose of holding a Japanese Exhibition.

Mr. Sharp thereupon moved that the recommendation be referred back to the Committee. Mr. Burns, M.P., seconded the amendment, and it was pointed out that the land might suffer in value from having upon it a Japanese Bazaar, which might be a very objectionable affair. Mr. Cornwall hoped the Committee would not insist on this matter. He thought the Council should be very sorry for it if they allowed such a bazaar to be held on a fine and central site. The amendment was rejected.

After further discussion the Chairman of the Committee consented to postpone the matter in view of bringing up a full report as to the purposes for which the land would be used. Other business was transacted, and the Council adjourned.

METHODS OF CONSTRUCTION, RAVENHILL, BELFAST.—The preliminary drawings have been laid out of a new church on the Ravenhill-road, Belfast, by an architect is Mr. Thomas Houston, and the builder is Mr. Robert Corry.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Formation of Streets.

Chelsea.—That an order be issued to Messrs. Bouchier, Burnester, & Galsworthy, sanctioning the formation or laying out of a new street for carriage traffic to lead out of the south-eastern side of Fulham-road, and in connexion therewith the widening of Little Keppel-street, and of a new street for carriage traffic to lead from Draycott-place to Keppel-street, Chelsea (for the Cadogan and Hansplace Estate (No. 3), Ltd.). That the applicants be informed that the Council regrets that they have not seen their way to make College-street or Marlborough-road 60 ft. in width.—Consent.

Lines of Frontage and Projections.

Kensington, South.—A hood and a two-story bay-window in front of No. 6, Pelham-street, South Kensington (Mr. A. Roberts for Mr. Phelps).—Consent.

Lewisham.—Porches at Nos. 87 to 101 (odd numbers only) inclusive, Longhurst-road, Lee (Mr. A. J. Wood).—Consent.

Lewisham.—One-story shops upon part of the forecourts of Nos. 86, 88, 90, and 92, Brownhill-road, Catford (Mr. T. A. Boughton for Mr. J. Allen).—Consent.

Rotherhithe.—The retention of two show-cases in front of No. 253, Southwark Park-road, Rotherhithe (Mr. E. Hoar).—Consent.

Strand.—Two projecting signs in front of No. 26, Charing-cross, Strand (Mr. J. N. Taylor for the Great Western Railway Company).—Consent.

Westminster.—A block of office buildings on the north side of Tothill-street, Westminster, eastward of the "Imperial" theatre (Mr. J. S. Gibson for Messrs. Holloway Brothers (London) Ltd.).—Consent.

Westminster.—A two-story oriel window in front of a block of office buildings on the north side of Tothill-street, Westminster, eastward of the "Imperial" theatre (Mr. J. S. Gibson for Messrs. Holloway Brothers (London) Ltd.).—Consent.

Marylebone, West.—An iron and glass covered way in front of No. 29, Abbey-road, St. John's Wood (Mr. W. Wallace for Mr. A. P. Watt).—Refused.

Paddington, North.—A covered way in front of No. 19, Clifton-villas, Paddington (Miss Magnus).—Refused.

St. George, Hanover-square.—A projecting sign at No. 171, New Bond-street, St. George, Hanover-square (Mr. P. M. Herder for Messrs. Esné Collins).—Refused.

Strand.—Permission to retain a wooden advertising enclosure in front of Nos. 5 and 5A, Coventry-street, Haymarket (Mr. R. H. Kerr for Mr. H. Appenrodt).—Refused.

Width of Way.

Brixton.—A dwelling-house on the southern side of Bloomgrove-road, Stockwell (Mr. H. Poston for the London Parcels Delivery Company, Ltd.).—Consent.

Kensington, South.—A one-story addition at the rear of No. 34, Addison-road, Kensington, with a boundary fence at less than the prescribed distance from the centre of the roadway of Holland Park-road (Mr. W. Callingham for Mr. S. Lee).—Consent.

Line of Frontage and Construction.

Kensington, North.—A cycle shed at the Edinburgh-road school, Kensington, to abut upon Branstone-street (Mr. T. J. Bailey for the Education Committee of the Council).—Consent.

Width of Way and Construction.

Brixton.—A wood, iron, and slate "loading bank," in a yard on the southern side of Bloomgrove-road, Stockwell, and with a boundary fence at less than the prescribed distance from the centre of the roadway of the street (Mr. H. Poston for the London Parcels Delivery Company, Ltd.).—Consent.

Width of Way, Line of Frontage, and Means of Escape at Top of High Buildings.

St. George, Hanover-square.—A building at Nos. 25 and 26, Berkeley-square, to abut upon Jones-street and Bourdon-street, St. George, Hanover-square (Mr. F. T. Verity for Mr. E. W. Whitehead).—Consent.

St. George, Hanover-square.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, on the fifth and sixth stories of a building at Nos. 25 and 26, Berkeley-square, to abut upon Jones-street and Bourdon-street, St. George, Hanover-square (Mr. F. T. Verity for Mr. E. W. Whitehead).—Consent.

Means of Escape at Top of High Buildings.

Kensington, South.—A deviation from the plans approved in respect of the means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, at blocks Nos. 1, 2, 3, and 6, Oakwood-court, Addison-road, Kensington, so far as relates to alterations at block No. 3 (Messrs. Rolfe & Matthews).—Consent.

Cubical Extent.

City of London.—The erection on the west side of Broken-wharf, Upper Thames-street, City, of a building to exceed in extent 250,000 cubic ft. (Messrs. H. F. Tasker & Slater for Messrs. Lever Brothers).—Refused.

Space at Rear.

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of two houses on the east side of Buckthorne-road, Crofton Park, Lewisham (Messrs. Tomkins and Connew).—Consent.

Wandsworth.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of two houses on the western side of Eswyn-road, Tooting (Mr. W. Bartholomew).—Consent.

Wandsworth.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building upon a site abutting upon Okburn-road, at the corner of Chertsey-street, Wandsworth (Mr. W. Bartholomew).—Consent.

Buildings for the Supply of Electricity.

Westminster.—Additions to a generating station and works at Milbank-street, Westminster (Mr. C. S. Peach for the Westminster Electric Supply Corporation, Ltd.).—Consent.

Dwelling-houses on Low-lying Land.

Greenwich.—A dwelling-house on low-lying land situated at Christchurch-street, East Greenwich (Mr. G. Atkinson for Mr. J. R. Piper).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS.—A meeting of this Society was held, on the 27th ult., in the Society's rooms, Leopold-street, when a lecture was given by Mr. C. F. Innocent on "Romanesque Architecture in England." Mr. Innocent said the architecture of the western provinces of the Roman Empire was much freer and less refined than that of the city, and Romanesque architecture was that which the Teutonic invaders of Western Europe developed from the specimens of Roman architecture which they found. There were two varieties of Romanesque architecture in England—Saxon and Norman. Such energetic builders were the Normans that very few examples of Saxon architecture remained, and those were nearly all of the century immediately preceding the Norman Conquest. There were within the Sheffield district forty-eight ancient churches which contained Norman work, but only two which contained Saxon work—viz., Langton-en-le-Morthen and Carlton-in-Lindrick. After discussing the formative elements in English Romanesque the lecturer went on to describe Saxon architecture in detail. He then considered the question of the origin of our Norman architecture, and showed that the early Roman cathedrals in design were based on the church of St. Stephen, at Caen, which William the Conqueror built as an offering for his victory at Hastings. Blythe Church, near Worksop, was an interesting example of the influence of the Caen church in this district. Then the lecturer described the features of Norman style in detail, and traced their development. He considered that Conisbrough Castle was the finest and most interesting example of the perfect Norman style in the district. Steeley Chapel, near Worksop, was also a most perfect and beautiful example. The lecturer showed how the demands of the church authorities for a fireproof roof led to the use of stone vaults, and he pointed out the various difficulties of construction which the medieval builders had to contend with, and which were successfully met by the invention of pointed arched vaulting. The lecturer finally showed what architecture owed to the Romanesque designers. The lecture was illustrated by lantern slides. On the motion of Mr. Mitchell Withers, seconded by Mr. E. M. Gibbs, and supported by Messrs. T. R. Wigfall and W. T. Hall and the President (Mr. T.

Winder), a vote of thanks was accorded to Mr. Innocent for his lecture.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. T. Cooper, President of the Birmingham Architectural Association, delivered his presidential address on the 28th ult., before a large attendance of members at the Norwich Chambers. He stated that it was not the architectural seed they had to fear so much as the barrenness of the soil in which it had to grow. Architecture was by no means an altogether lost art, and there was a sufficiency of the true artistic spirit to be found could it only meet with a suitable environment to aid its growth. But in these days all the conditions seemed adverse. The increase of luxury and the almost universal indulgence in ostentatious display had necessarily led to the cheap and nasty, and vulgarly pretentious erections of the jerry builder. Mr. Cooper spoke of the prospect of a scheme for architectural education being formulated—an education that might foster the artistic instincts, while it did not lose sight of the many-sided responsibilities that crowded in upon the architect in the carrying out of the multifarious duties that modern custom had allotted to him. Touching upon local topics the President remarked that recently a letter appeared in the local press asking how it was that the Birmingham Architectural Association, with others, had not come forward to prevent the erection in so important a street as Stephenson-street of such a front (to be ultra Irish) as the back of the New Theatre Royal. The reply was obvious. The Association had no means of knowing before it was erected what manner of building was proposed, and secondly, that if it had that knowledge it would have no power to enforce its views. They could not but regret that the promoters of the scheme in question should, in providing a home for the drama, have thought fit entirely to disregard another art, and thrust such a purely utilitarian erection as a plain brick wall and a plumber's trophy before the gaze of those entering the city by its most important gate. The object should be to try and educate and lead the public as to what the requirements of good architecture were; and so in time to obtain a measure of that civic pride combined with a true feeling for art, which produced such glorious results as those that still remained to us, in fading splendour, in the great cities of the Middle Ages.

"DESIGN FOR A CRESCENT."—In printing Mr. Hiorus' description of this drawing last week, we should have added that the drawing was accepted and exhibited at the Royal Academy this year.

Illustrations.

PART OF CARTWRIGHT MEMORIAL HALL, BRADFORD.

THIS drawing, which was exhibited at the Royal Academy this year, shows a portion of the exterior architecture of the Cartwright Memorial Hall. The massive rusticated basement contrasts very well with the columnar order above, and the whole makes an effective picture.

We may be able to give on a future occasion a complete view and a plan of the Hall, of which the present illustration may be regarded as a kind of architectural extract.

DECORATIVE DESIGNS BY STUDENTS OF THE ROYAL COLLEGE OF ART.

The designs numbered 1 to 5 form part of a set which gained for their author, Mr. E. Walker, the Travelling Studentship in design for 1904 of the Royal College of Art, South Kensington.

Nos. 1 and 2 are designs for large ecclesiastical tapestries. No. 1 is of gold strapwork on a red and blue ground. The sub-divisions are filled with symbolical foliage and contain the words "*Ave Maria gratia plena*," and the monogram of the Virgin, "M.R." No. 2 is in a scheme of gold, red, and green. The large horizontal bands of blue circles contain the monograms of Christ in gold letters whilst the circle between bears the emblem of everlasting life.

No. 3 is a design for a heraldic tapestry for the hall of a large house. The shields, mantlings, helms, and crests are those of the owner and his wife, falling into vertical strips. The general colour is a quiet scheme of grey-green, red, blue, and gold.

No. 4 is a design for an embroidered altar frontal cloth. The central figure is that of Christ surrounded by adoring angels, and on either side two figures, St. Paul, St. James the Greater, St. Peter, and St. John the Evangelist. The band bears the inscription, "I am the vine, ye are the branches," and the vine springing from behind the central figure and branching round the figures of the saints is intended to typify the words. The cloth colour is a dark blue, and the figures and foliage are embroidered thereon in quiet tones of green, purple, and brown.

No. 5 is a design for a large heraldic wall painting, the motive being the British lion with the motto "*Dieu et mon droit*" upon a label issuing from its mouth. The background is red and the lions gold.

The decorative design by Mr. Lancelot Crane (No. 6), "St. John," is really a design for a

compartment of a ceiling. The student was asked to make designs for a vaulted ceiling; the subject to be "The Four Gospels." Small scale models were constructed to show the general scheme, colour, et cetera, afterwards a full-size cartoon was made of the figures. The photograph reproduced on the plate was taken from Mr. Crane's model which was done in black and white on paper. The chequer pattern shows the effect of the vaulting. The design was intended for mosaic, but might be treated in tempera fresco painting. The colour scheme is simple—mainly two tones of yellowish green against a background of warm white, the black with the emblem in gold, and the black, white, and gold.

PREMISES, 91 TO 99, OXFORD-ST.

THESE are some new premises on the side of Oxford-street, which attracted their original and pleasing treatment of the architects, Messrs. Read & Macdonald, kindly assented to our request for photographs of them.

The building, which is built of rubble and Portland stone, has been carried out by Messrs. Walter Holt & Sons, of Croydon. The architects observe that the design is a result of the inevitable calamity of the requirements of modern shopkeepers with large sheets of glass with no piers. But is it inevitable that we should get shopkeepers (and the public) to see that a shop front designed with truth and effectiveness of design is superior to, and is more attractive than, an erection appearing to stand on plate glass? It might find that there would be a move on the part of tradesmen to secure good architectural fronts, as a trade advantage worth such a little light for. In every architect who has his best to explain and enforce that in time a reform in shop architecture has been brought about, though it will no doubt rather long business.

PRIORY COURT, WEST HAMPSHIRE.

THIS block, containing twenty-eight contained residential suites, faces Marlborough Avenue with a frontage of 250 ft. The building is well set back from the road, the front being laid out as an ornamental garden. The flats contain six and seven rooms each, with usual offices. The elevation is carried out in red brick and rough cast, with green slated roofs.

The architects are Messrs. Palgrave & Chesbarn, and the contractors Messrs. Mead & Bates. Mr. J. Farrell was the clerk of works.



Priory Court, Hampstead. Plan.

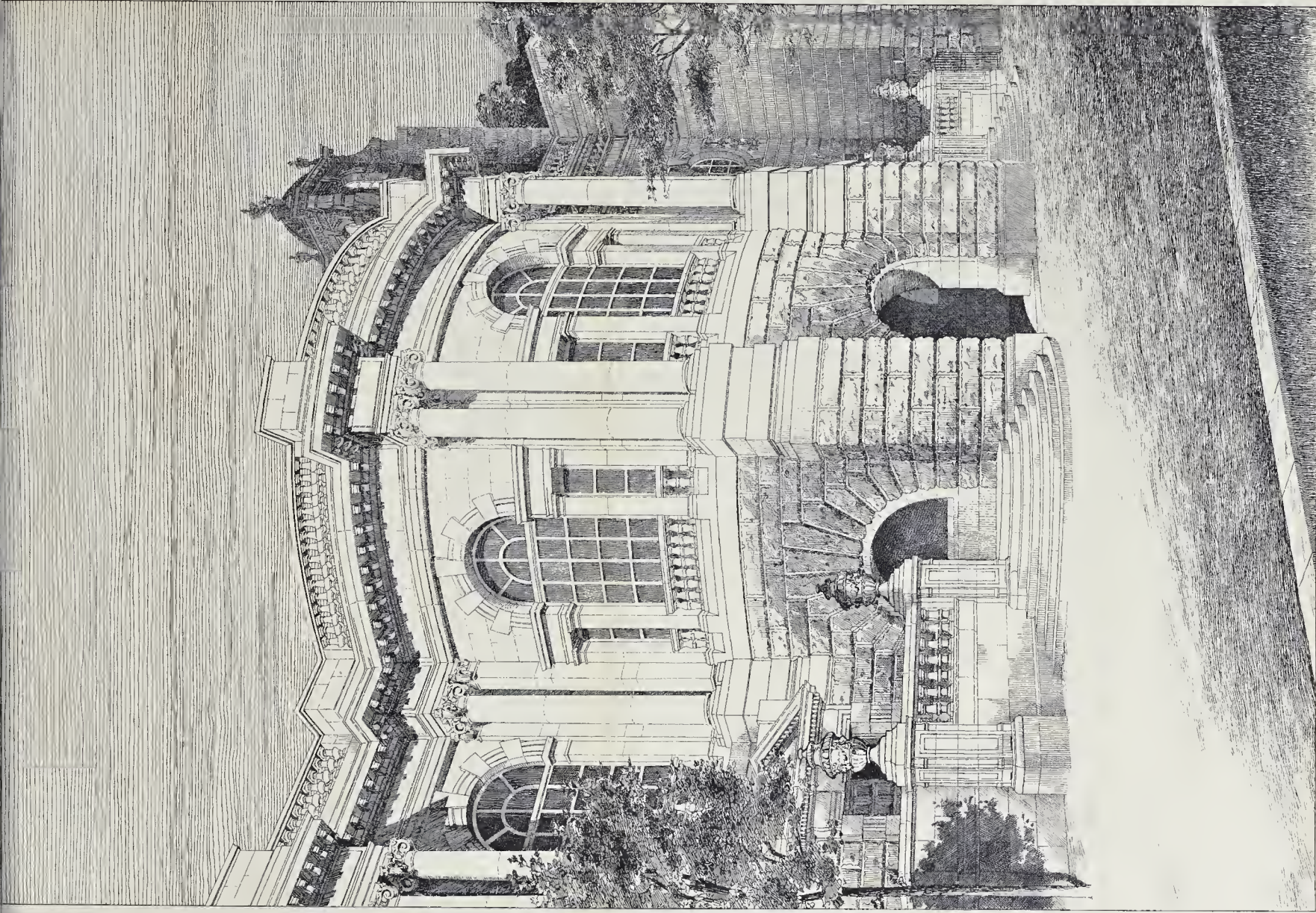
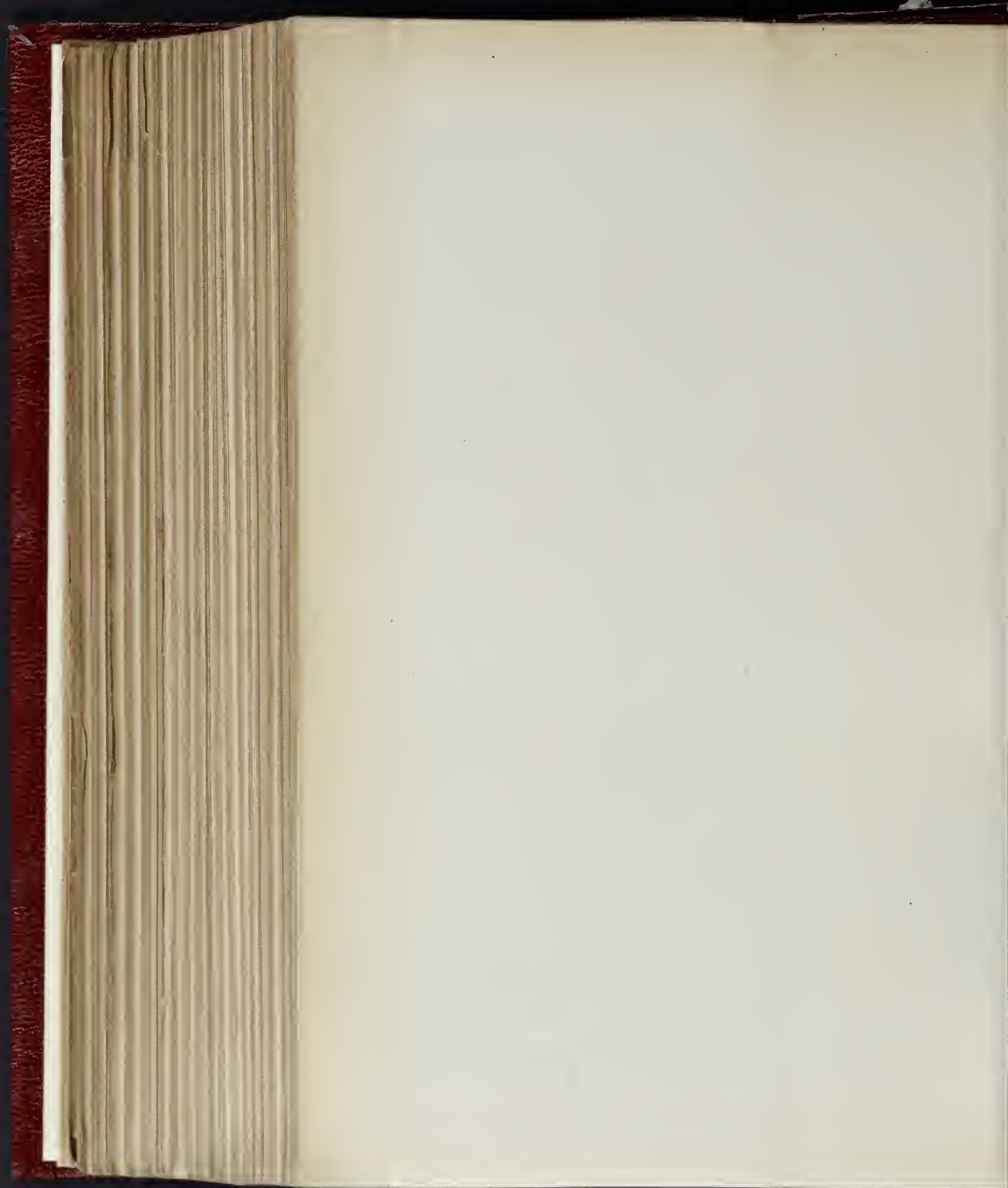
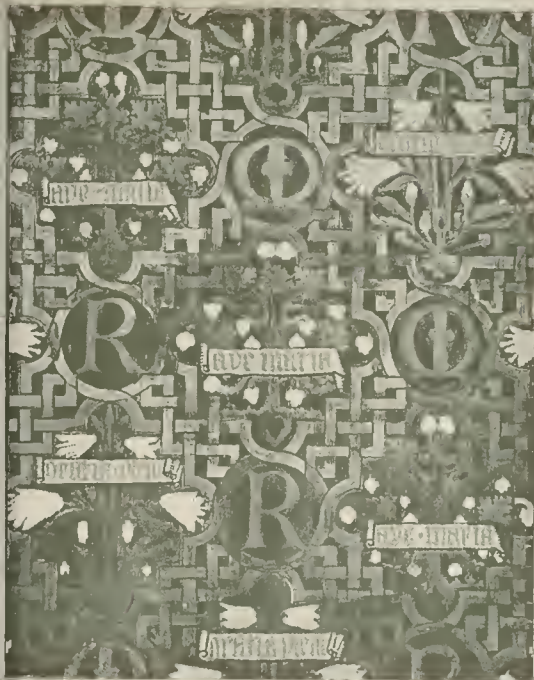


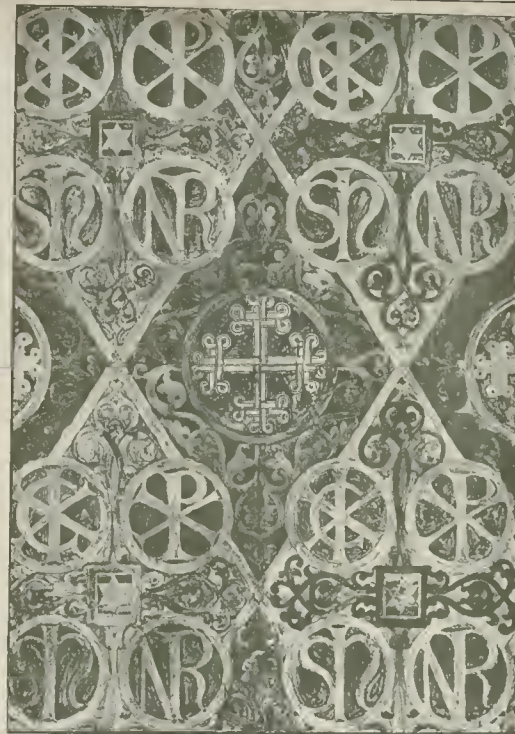
PHOTO LIND, STURGE E.C. 17, 48 & 49 EAST BRADFORD STREET, BRADFORD, W. YORKS.

PART OF THE CARTWRIGHT MEMORIAL HALL, BRADFORD—MESSRS. JOHN W. SIMPSON & F. M. ALLEN, ARCHITECTS

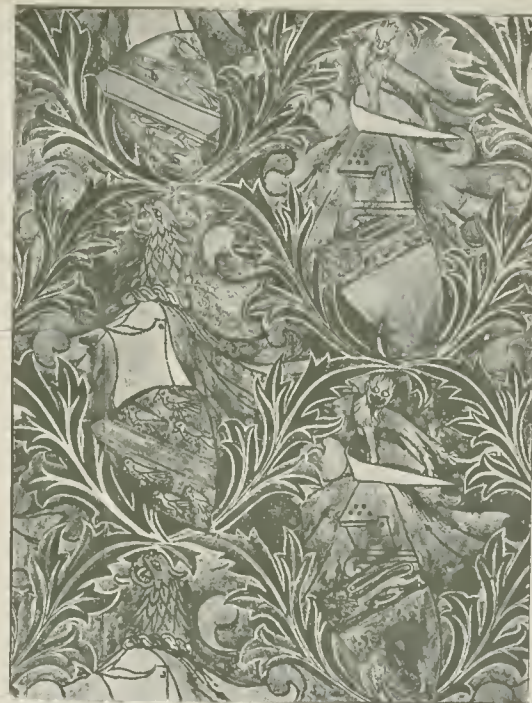




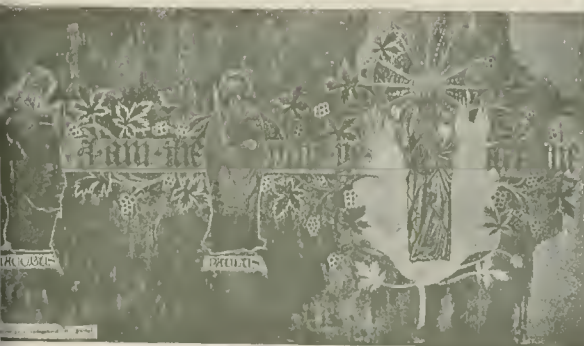
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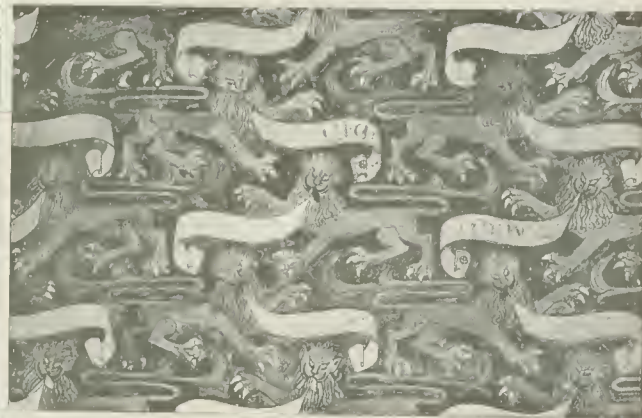
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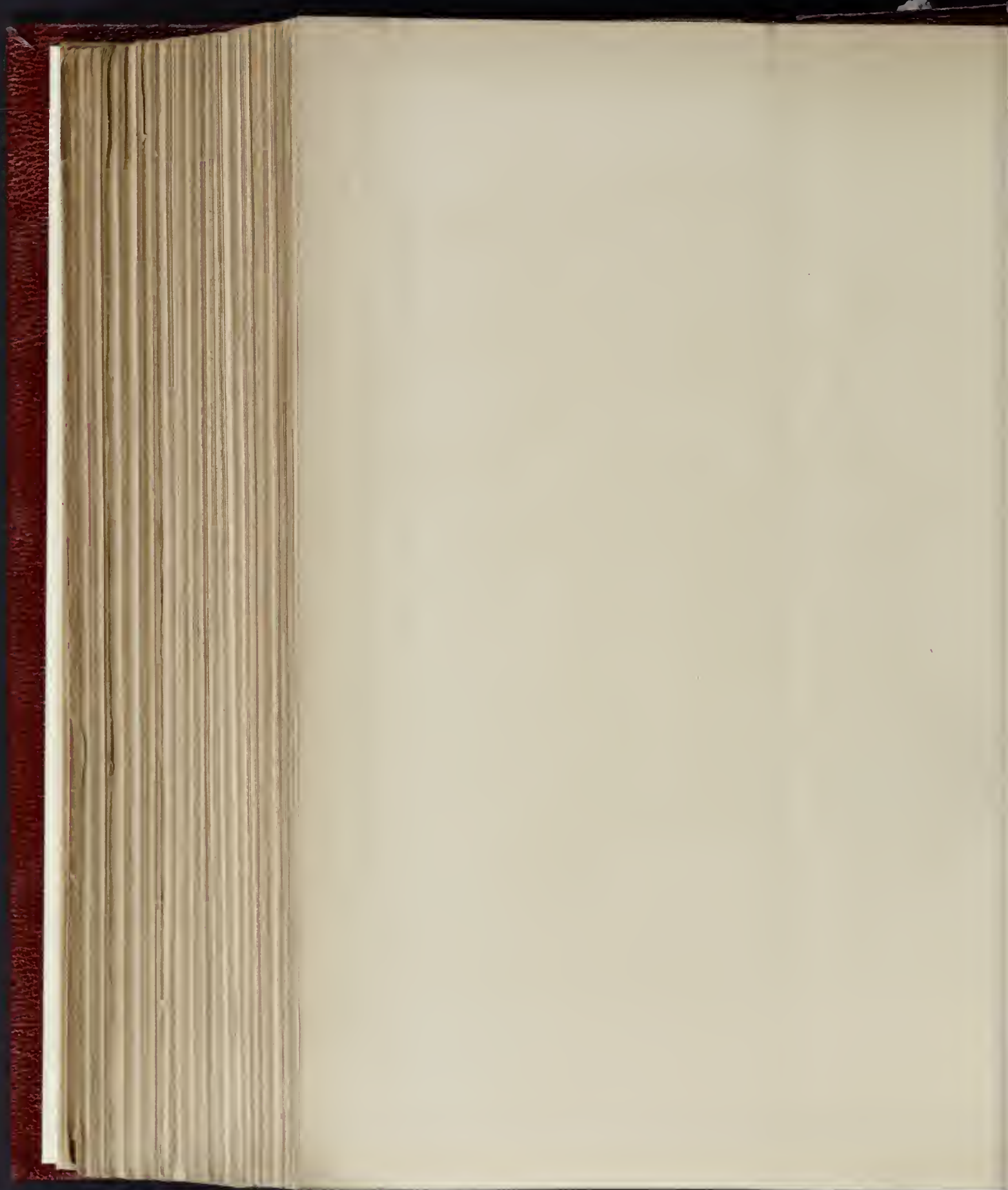


5.

Nos. 1 to 5—DESIGNS FOR TEXTILES.
By MR. EDWARD WALKER.

NO. 6.—WALL DECORATION.
By MR. LANCELOT CRANE

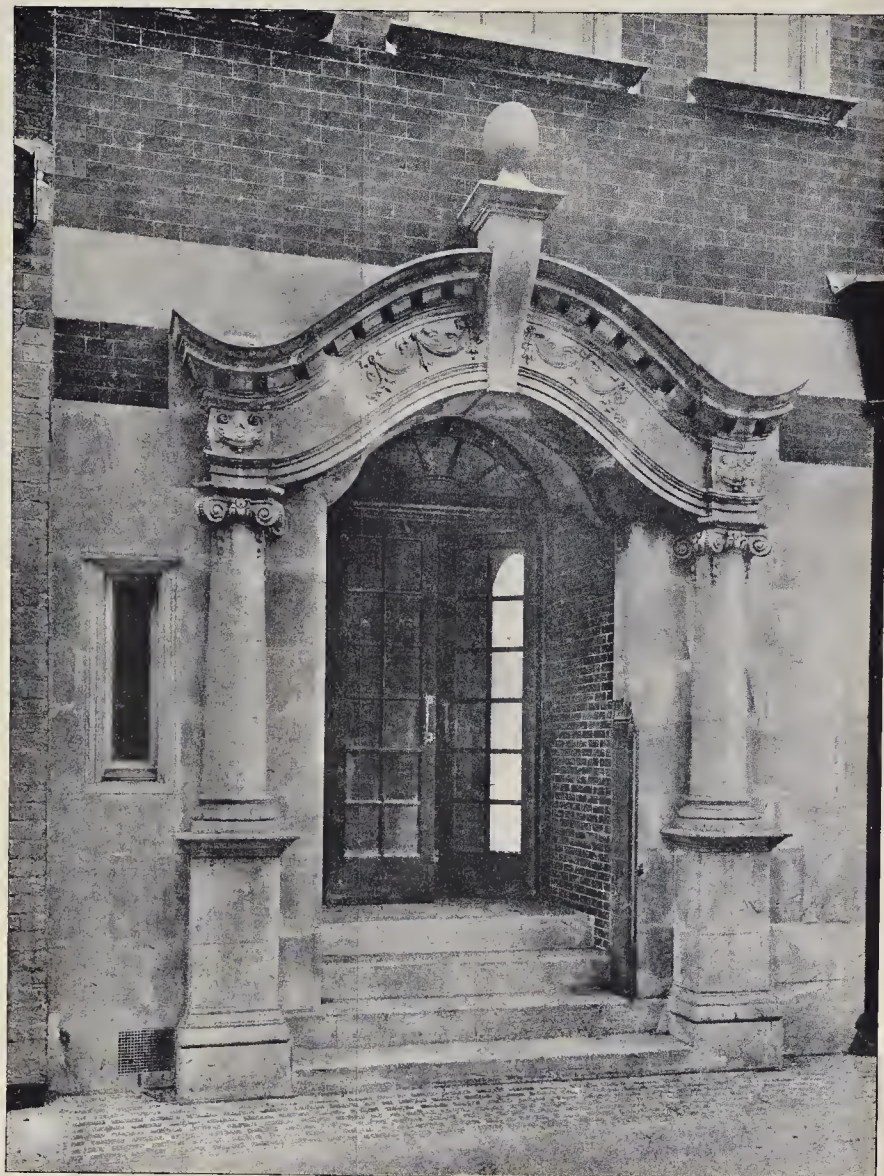
INK PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE, E.C.





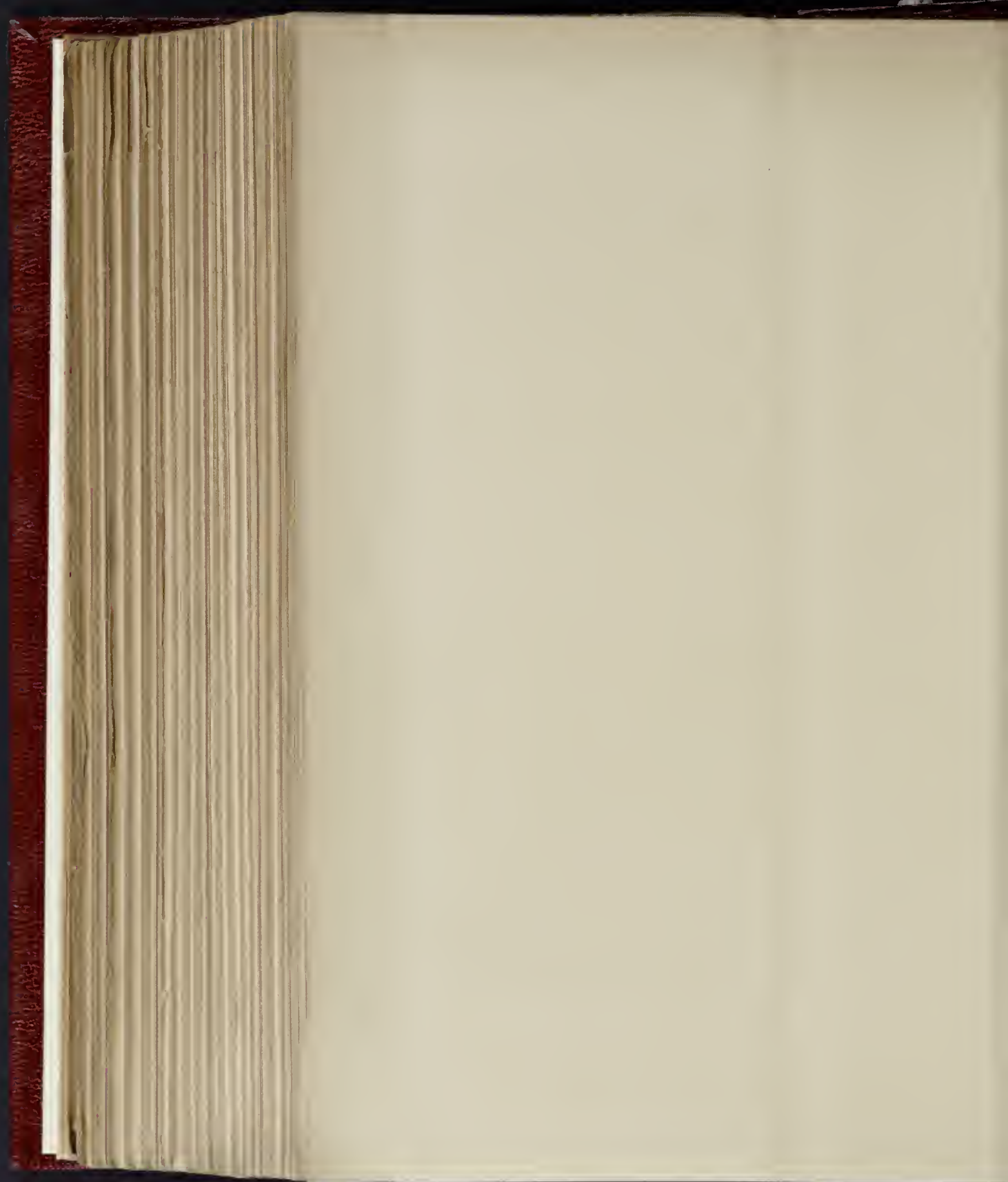
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PREMISES, 91-99 OXFORD STREET.—MESSRS. READ & MACDONALD, ARCHITECTS.



INK PHOTO, SPRAGUE & CO. L^{TD} 4 & 5, EAST HARDING STREET, FETTER LANE E.C.

No. 91 OXFORD STREET: SIDE ENTRANCE.—MESSRS. READ & MACDONALD, ARCHITECTS.





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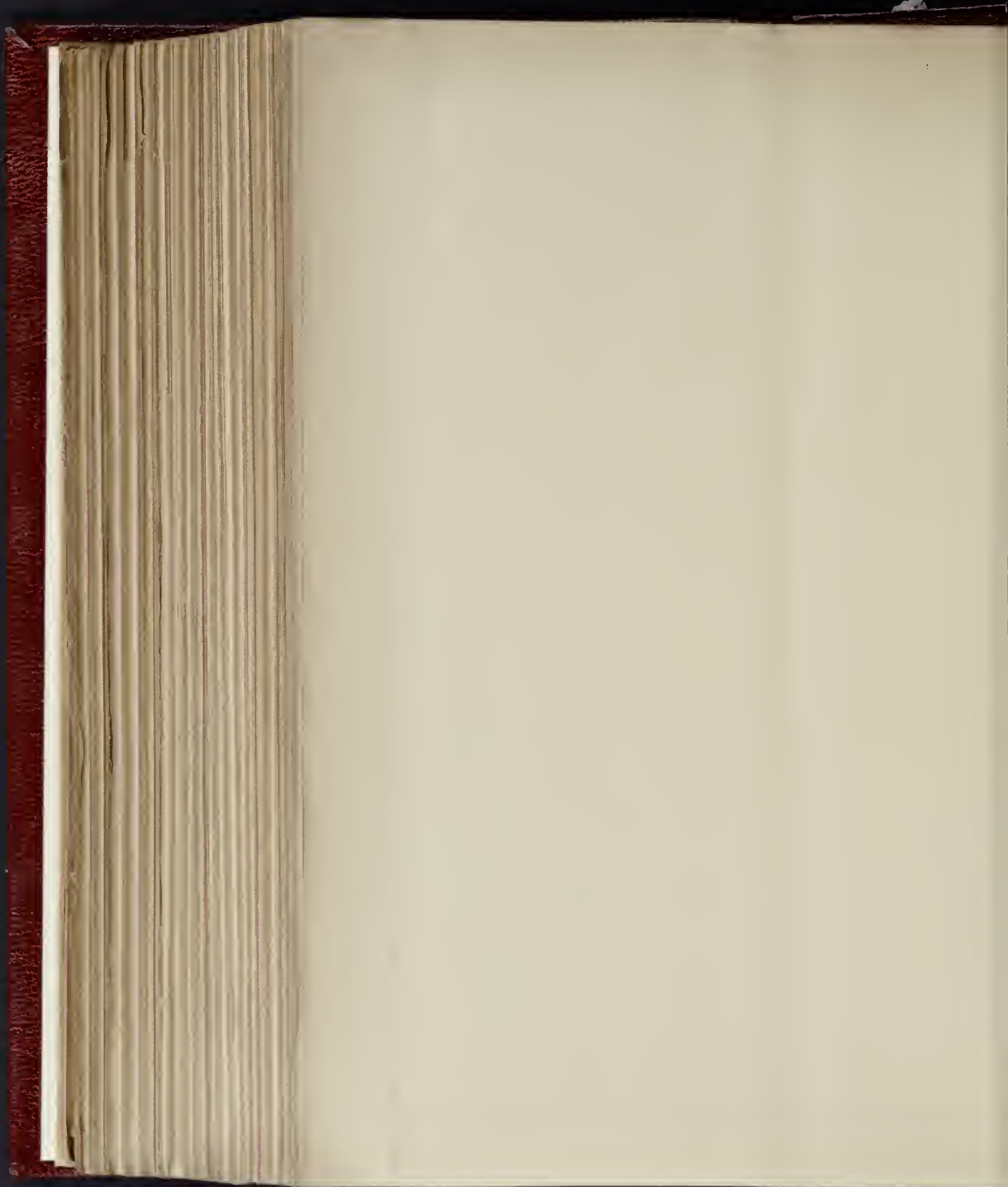
PRORY COURT, HAMPSTEAD, N.W.—MESSRS. PALGRAVE & Co., ARCHITECTS

THE BUILDER, NOVEMBER 5, 1904.

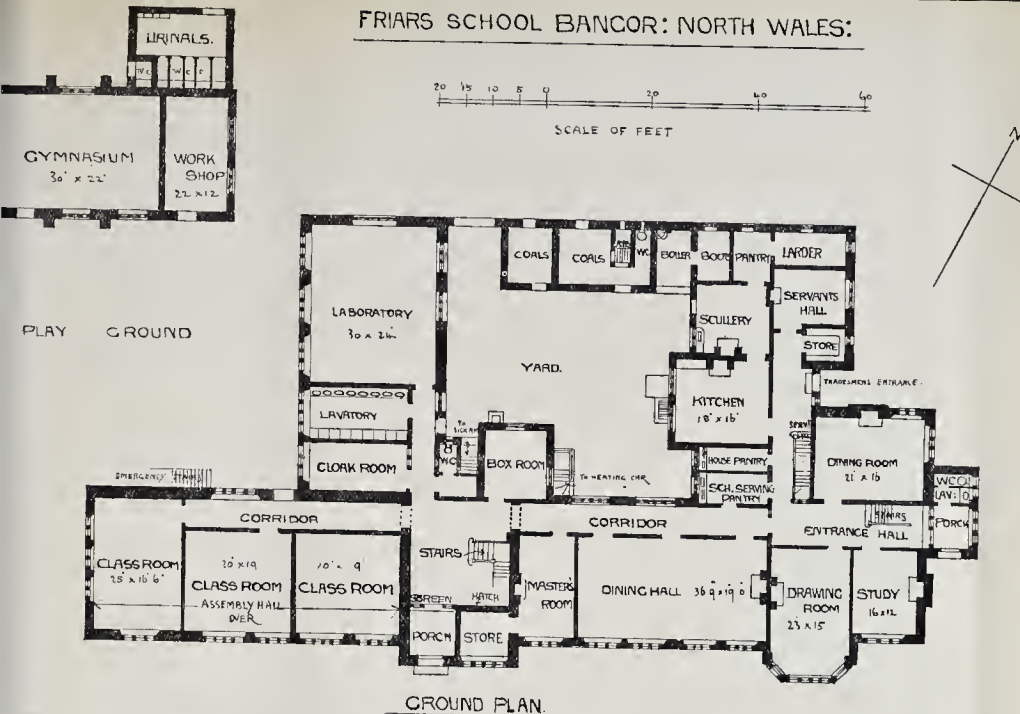


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FRIARS SCHOOL, BANGOR, NORTH WALES.—MESSRS. DOUGLAS & MINSHULL, ARCHITECTS



FRIARS SCHOOL BANGOR: NORTH WALES:



GROUND PLAN.

FRIARS SCHOOL, BANGOR, N. WALES. This building, replacing the former school in the lower part of the city, stands on a fine site in Upper Bangor, commanding a view of the Snowdonian mountains and the Irish Straits.

The fact of the new school being the outgrowth of one of the old foundation grammar schools was taken into consideration in designing the new buildings, and to some extent influenced the general disposition and also the treatment of the exterior, the aim being to perpetuate the old school origin and character.

In addition to the school accommodation the headmaster's house, which occupies the main wing on the ground floor (see plan), is on the first floor an assembly hall 58 ft. ft. and dormitory space for forty boys.

Quarters are provided on the upper floor for the tower and their isolation secured by a staircase access and stairway from the outside. The materials employed are:—Walling, Llystone; window dressings, etc., red sandstone covering, green slates.

Pressure heating with radiators has been provided, and adequate ventilation provided. Messrs. James Hamilton, contractors, Bangor, carried out the work at a total cost of about 10,000l., the architects being Messrs. G. S. & Miushull, of Chester.

HOUSING QUESTION, BRISTOL.—On the 4th ult. Mr. W. O. E. Meade-King, M.C.E., one of the inspectors of the Local Government Board, held an inquiry at the request of the Bristol City Council for the approval of the Board to a scheme for the provision of workmen's dwellings to provide accommodation in lieu of that displaced by improvements. Mr. W. H. Wise conducted the case on behalf of the Corporation. Yabbicom, Borough Engineer, gave evidence as to the buildings proposed to be erected. Each would have a frontage of 16 ft. on the main road, the fronts set back to a minimum of 15 ft. from the street line. The depth of the house and back space would be a total of 75 ft. from the street line to the back boundary. Each house would be on the ground floor a sitting-room, 10 in. by 10 ft. 3 in.; a living-room, 10 in. by 12 ft. 7 in.; a scullery, 10 ft. by 10 in.; and larder and lavatory. The upper floor would contain three bedrooms, 10 in. by 10 ft. 3 in., 12 ft. by 9 ft. 10 in., and 8 ft. by 6 in. The four houses would accommodate twenty-eight persons.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—The annual general meeting of this Institution was held recently at the Westminster Palace Hotel, when the council's report, balance sheet, etc., were presented. The number of members is now nearly 800. Mr. Samuel Cutler, jun., M.I.Mech.E., was re-elected chairman. During the evening two of the past chairmen, Mr. W. J. Tennant and Mr. Percival Marshall, gave an account, illustrated by lantern slides, of their visit to the United States and the St. Louis Exhibition. On Saturday afternoon, October 22, the members paid a visit to Messrs. Stuart's Granolithic Stone Works at Millwall Dock, Mr. Peter Stuart showing them over. He had considerably kept the machinery running, so that all the processes in the manufacture of the stone could be seen. Electric power is used for the crushers and grinders, current being obtained from the public supply. There is also an electric elevated transporter running on a rail for conveying finishing blocks between different parts of the works. Some striking examples of the strength of the material were shown, and tests were conducted on some of the specimens. Another visit occurred on the following Saturday afternoon, when an inspection was made of the National Physical Laboratory at Bushy House, Teddington. For upwards of two hours the members, under the guidance of Dr. Glazebrook, were kept interested examining and listening to the explanations of the uses and modes of manipulation of the many beautiful instruments and appliances to be seen throughout the various departments of the laboratory, including thermometric, electrical, photometric, metallographic, metrologic, photographic, optical, chemical, and engineering (wind pressure testing, alternative stress testing, insulating material testing, temperature distribution in field coils, etc.). Mr. S. Cutler, jun., in moving a vote of thanks to the director and his staff at the conclusion of the visit, alluded to the great practical utility of the work carried on in the laboratory, which afforded an excellent illustration of the application of science to the solution of the everyday problems which confronted the engineer, chemist, and other commercial men in their work. The opening meeting of the new session is to take place on November 18, when Mr. W. H. Lindley, M.Inst.C.E., F.G.S., of Frankfort-on-Maine, is to deliver the presidential address, his subject being "Municipal Engineering on the Continent."

COMPETITIONS.

WESLEYAN HALL, BIRKENHEAD.—In an open competition held recently for a new Wesleyan Hall, Price-street, Birkenhead, the design of Messrs. T. T. Rees and Frank Birmingham was placed first, and they have received instructions to carry out the work.

BRIDGE, AYLESFORD.—Twenty-eight sets of plans were sent in for the premium of 100 guineas offered for the selected plan. The Maidstone Town Council associated with their Committee the governing body of the Lower Medway Navigation Company, and also had the assistance of an assessor (Mr. A. V. Nurtzig, M.Inst.C.E.) nominated by the President of the Institution of Civil Engineers. Messrs. Dodd & Dodd, of 37, Waterloo-street, Birmingham, were awarded the premium. The estimated prices for the new structure are as follows:—Bridge, 20,950l.; approaches, 6,935l.; contingencies, 10 per cent., 2,788l.—total, 30,673l. The material for the construction will be Kentish rag and granite. The width of roadway over the bridge will be 30 ft., with a footpath of 5 ft. on each side.

BOOKS RECEIVED.

AIDS TO THE STUDY OF SANITARY LAW. By H. Critchley, M.D. (Baillière, Tindal, & Cox. 2s. 6d.)
THE MECHANICAL WORLD POCKET DIARY FOR 1905. (Emmot & Co., Manchester. 6d.)

Correspondence.

RECOVERY OF OUTLAY UNDER SANITARY ORDERS.

SIR,—The desirability of obtaining expert advice before complying with written notices or verbal instructions issued by sanitary officials is not sufficiently recognised by property owners. Otherwise, with the best of cases for recovering outlay which has been improperly forced upon them, there is no chance of success against a local authority which meanly repudiates the acts of its officials. In the case of *Klett v. Camberwell Vestry* (1896), plaintiff sought to recover for reconstructing a combined drain. Vestry's counsel admitted it was a "sewer," and the point was whether the notice given by the sanitary inspector was, in fact, a "request" to do the work. Judge Emden said "it must be shown that there was an expressed or implied

request from the vestry, or, in the alternative, that the plaintiff suffered damage through the neglect of the vestry to carry out their official and public duties—i.e., to have done the work themselves. It seemed to him impossible to construe the notice given by the defendant vestry into a request. It was a mere intimation by an officer" (1) This, in face of an order in writing under an Act of Parliament, signed by a responsible and recognised official, whose act in an ordinary way, would be that of an agent for his principal.

An opposite judgment, so far as one gathers from the reports, was in North and Another v. Walthamstow Urban District Council (1893). Here the pretext of defendants was, that the notice was not given by them, but by the sanitary officer on his own responsibility. Mr. Justice Channell said: "The question is, what degree of compulsion is necessary to entitle the plaintiffs to recover? The compulsion need not be irresistible. If a public body comes to a person and either commences or threatens proceedings, such person is no longer a volunteer. A person in such a position is under an obligation to do the work. A mere indirect compulsion is sufficient. Judgment must be for the plaintiffs." As the notice given was by the official only, the responsibility of his employers, therefore, is duly recognised by this verdict, contrary to Judge Emden's decision, before cited, that such a notice was "a mere intimation by an officer." It may have been this case that the Walthamstow Urban District Council relied on to shirk their responsibility. An owner employing a builder to open up a drain under such a notice should stop the work immediately a combined system is found to exist, and take proper advice as to his liability to complete, or to call upon the local authority to do so, and refund his outlay. Builders go on and finish the work by verbal instructions of these officials without regard to the rights of the matter, and then, if the owner is bold enough to take proceedings afterwards, the difficulty and expense is greatly increased, and the defendants get behind their officers for shelter. By insisting on an order by the board or council before proceeding, this would be obviated. E. W. HUDSON, F.S.I.

CLOCK TOWER.

SIR.—As the architect of a clock tower recently erected for a public body, I shall be glad to hear from other architects who have carried out such towers under 1,000*l.* in value.

ROBERT HEMBROW,
Architect.

174, Queen's-road, Hastings.

OBITUARY.

MR. C. FOULSHAM.—We have to record the death of Mr. Chester Foulsham, which occurred on the 23rd ult. Mr. Foulsham was born October 26, 1837. In 1874 he was appointed by the Metropolitan Board of Works, District Surveyor for St. Leonard, Bromley, and he retained that post to the time of his death.

METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of the managers of the Metropolitan Asylums District was held on Saturday last week at the office, Victoria Embankment, W.C.

Tooting Bee Asylum.—Among the correspondence received was a communication from the Local Government Board sanctioning the proposal to enter into a contract with Messrs. C. P. Kinnell & Co. for the revision of the heating arrangements of the administrative block and the staff blocks at this asylum, at a cost of 480*l.*, without first advertising for tenders. The Finance Committee reported having considered in its financial bearing the following estimate of the Works Committee of the cost of additional building which it is proposed to erect at the asylum:—New buildings, 29,500*l.*; alterations to existing buildings, 500*l.*; drainage and water supply, 700*l.*; heating and lighting, 2,350*l.*; laying out grounds, etc., 450*l.*; quantity surveyor's charges, 600*l.*; clerk of works' salary, 300*l.*; contingencies, 1,750*l.*; total, 36,250*l.* On the recommendation of the Committee it was agreed to apply to the Local Government Board for an order sanctioning the incurring of this expenditure.

Joyce Green Hospital.—It was agreed, on the recommendation of the Finance Committee, to apply to the Local Government Board for permission to incur an expenditure of a sum not exceeding 7,000*l.*, the balance of the estimated cost of executing certain internal painting work at Joyce Green Hospital.

Belmont Asylum.—Messrs. R. L. Curtis & Sons were appointed to measure up the

variations of Messrs. Enness Brothers' contract for alterations and addition at this asylum. The amount of the contract was 15,750*l.*, and the Works Committee reported that the sanctioned variation which increased the amount by 144*l.* 7*s.*

GENERAL BUILDING NEWS.

CHURCH, PRESTWICH.—The Bishop of Manchester (Dr. Knox) consecrated, on the 18th ult., the new Church of St. Hilda, which will form a chapel-of-ease to Prestwich Parish Church. It is in Whitaker-lane, Prestwich. The new church, as it stands at present, forms only part of the complete design, which aims at a westward extension, lengthening the nave and increasing the accommodation. There are now seats for about 350, including the choir, and, by the extension, room will be made for about 200 more. The portion built consists of the chancel and three bays of the nave and its aisles, leaving the completion of the latter and other portions to be carried out when the needed accommodation is required. The oak altar is by Mr. Bridgeman, of Lichfield, from the architect's design. The cost of the church has been about 3,700*l.* The architect is Mr. Frank P. Oakley, of Manchester.

CHURCH, BYKER HILL, NEWCASTLE-ON-TYNE.—On the 17th ult. the foundation-stone was laid of the new Church of St. Mark, Byker Hill, Newcastle. St. Mark's Church is designed in the XVth century style, the plan being in the form of a parallelogram with nave and chancel, aisles, vestries, and organ chamber. The total length from east to west is 117 ft. 6 in., the nave and chancel being 27 ft. 6 in. wide, and the total width of the church being 63 ft. 6 in. The nave and chancel are somewhat lofty, the height from the nave floor to the apex of the roof being 54 ft. They are lighted by a range of three-light, square-headed, traceryed, clearstory windows. At the east end there is a seven-light window. The church is to be built externally of stone from the Windy Nook quarries, the pillars and inside stonework being of Denwick stone. The roofs, which are all of the open timber type, are to be of pitch-pine, as well as the whole of the seats, screens, pulpit, wall panelling, etc. Provision is made for two bells in a bell gable over the chancel arch. Sitting accommodation for 300 adults is provided. The contract for the building has been let to Messrs. J. and W. Lowry, and that for the chancel fittings to Messrs. Robson and Sons, both of Newcastle. Messrs. Hicks and Charlewood, of Newcastle, are the architects.

CHURCH RESTORATION, CUDWORTH, SOMERSETSHIRE.—The reopening of Cudworth parish church, after having undergone restoration, took place recently. A new oak ceiling has been placed in the chancel, the foundations of the walls have been attended to, the stonework has been pointed and repaired where necessary, and the whole building inside and out put in a state of repair. The stone floor has been relaid, and the roof made watertight. The work has been carried out by Mr. C. A. Hain, Beamister, under the supervision of Mr. E. Buckle, the Diocesan Architect.

LECTURE HALL AND SCHOOLROOMS, BELMONT, SHREWSBURY.—The foundation-stone was laid recently of a new Presbyterian lecture hall and schoolrooms at Belmont. The contract for the work amounts to 1,190*l.*, and Messrs. R. Price & Son, of Coleham, Shrewsbury, are the builders. The architect is Mr. G. Dickens Lewis.

CALVINISTIC METHODIST CHAPEL, PENMAENMAWR.—The erection of the new Jerusalem Chapel at Penmaenmawr has been completed. The building occupies a position adjoining the main road, on the Bryn Môr Estate, and is planned with nave and transepts. Accommodation is provided for 650, which includes 130 places in the gallery. The pewing and other fittings are of selected light-grained varnished pitch-pine. The floors throughout have been laid with wood block, by Messrs. Burgess and Co., Liverpool. The glazing throughout is of lead light, and manufactured by Turner and Co., St. Helens. The ceiling work was done by Messrs. E. Cross and Sons, Liverpool. The external walls are faced with picked and selected local stones, from Messrs. Darbishire, Ltd.'s quarries. The dressings and weathering are of Lintwaite stone. The roof is covered with Dinorwic slates, and two roof extract ventilators have been fixed. The ventilation generally has been done by Messrs. James Stott and Co. The heating of the whole premises is by the low-pressure system, and has been carried out by Mr. J. E. Miller, of Liverpool. The ornamental railings were provided by Mr. Walter MacFarlane, Glasgow. The joinery and carpentry work was executed by Mr. John Jones, Penmaenmawr, and the

masonry work by Mr. Erasmus Jones, Llanfechan. The tiling and faience work was by Mr. J. C. Edwards, Rubon; the painting work by J. Bealy and Co.; and the glazing and varnishing work by Mr. W. Pritchard, of Penmaenmawr. The school-mises consist of an assembly hall to seat scholars, with classrooms, vestries, kitchen, deacon's parlour, etc. The architect was J. S. Coverley, Penmaenmawr. The cost amounts to about 6,500*l.*

GIRLS' SCHOOL, LYNN.—The new Lynn School, adjoining Ferry-lane, was opened short time ago. The buildings form a block 150 ft. in length. They are constructed of red brick, having roofs covered with E tiles, and adjoin at their eastern end the boarding-house, a portion of which has been modified in order to effect a convenient junction. Electricity is used for lighting purposes throughout, and the main system is lighted with Nernst lamps. Ventilation is afforded by means of wall and Boyle's extractors. The architect was Mr. H. J. Green of Norwich and Lynn. Mr. J. Cracknell, of Peterborough, was the builder. The cost of the buildings was 3,500*l.*

NEW SCHOOL, THORNTON, N.B.—On the 18th ult. the opening took place of a public school at Thornton. The building which has been erected from the plans of Messrs. James Gillespie and Scott, architects, is of red brick, with red tile roofs. The site occupies 1½ acres of ground. There is a central hall, 50 ft. by 25 ft., which entrance is made to the various rooms, of which there are eight. There is also lavatory and cloak-room accommodation. The total cost of the building was a little over 5,000*l.*, and there is accommodated nearly 600 pupils.

SCHOOL, EAST LEEDS.—A new school has been erected in Leeds. The new building, which has been named the "Victoria School," has been erected on a site in York-road, containing about 7,650 yds., having frontages on three sides to streets, and access from streets on the remaining side. The site is in three blocks. The largest block, in York-road, provides accommodation for junior children on the ground floor and senior children on the upper floor.

The infants' school is a separate building, and provision has been made for 410 infants. The third block contains manual instruction department, laundry and cookery room, caretaker's house attached. Three halls are provided, the classrooms arranged on three sides of same, and each case directly entered from the hall. Classrooms are planned for sixty children in all cases except the babies' room, and entrances are provided to each department with cloak rooms immediately adjoining staircases and corridors are fireproof throughout. The manual instruction-room is placed between the laundry and cookery rooms. The fittings have been carried out in local brick stone, and were designed by the architect, the Education Committee, Mr. W. S. Waite. The works have been carried

out by the following contractors:—Brick and work, Messrs. J. H. Wood; carpenters and joiners, Messrs. Ledgard and Sons; plumbers, Mr. J. H. Crossland; slater, Mr. J. W. Mond; plasterers, Messrs. Pennington and ironwork and cloak rails, Messrs. L. and Sons, Ltd.; concreting, Mr. S. J. Lane; painting, Messrs. Roylance and man; heating, Messrs. Braithwaite and electric lighting, Messrs. Dixon and Ltd. The total cost of the site, building and fittings will be about 13,300*l.*

WESLEY MEMORIAL SCHOOL, LEATHERHEAD.—The foundation-stones of the Sunday school, erected adjoining the Wesleyan Chapel, Leatherhead, were laid recently. The work is being carried out by Messrs. Johnson, of Wandsworth, according to the plans of James Weir, architect, Victoria-street. The building is of red brick, with Bath stone dressing. The east end of the school is cut from the rear of the church, and has in the front a porch. On the upper will be a Wesley Hall, giving accommodation for 350 people. The total accommodation provided in the building will be 1,000 people.

HOTEL, ABERTRIDWRE.—The first instalment of the Glamorgan Public-house Company was launched on the 21st ult. Sir John T. D. Lewis, its chairman, formally opened the Windsor Hotel, Abertridwre. The exterior of the building is built on the ground floor with facings of Penmaenmawr dressed with red Mansfield stone, Bath and red brick, while the upper storey is faced with rough stucco, with dressed red brick. The entrance to the bars, on the corner, is beneath a portico of

stone columns and arches, while above it turret stands up from the green-slate roof. The interior on the ground floor are concrete, coffee, and smoke rooms, and the manager's office, besides two bars—one for inebriates and the other for non-intoxicants. There is a suite of rooms for the manager and his family on the first floor, together with guests' bedrooms and a billiard and club room, which has separate communication with the street. On the second floor are the manager's bedrooms, while in the basement kitchen, scullery, pantries, etc., and beer wine cellars. At the back is a yard, with a building for five horses, as well as harness-room, and covered sheds for vehicles.

The building is lighted with acetylene gas. The architect was Mr. H. Snell, of Penarth, and the builder Mr. W. T. Morgan, of Cardiff. The cost of the building, inclusive of furnishing and other expenses, is about 6,000.

OLYMPIAN HEADQUARTERS, LIVERPOOL.—The main opening took place on the 22nd ult. of new headquarters of the 8th (Scottish) Volunteer Battalion of the King's (Liverpool Regiment), in Fraser-street. The total length of the shed is 155 ft. by 60 ft., and there are three ranges in Fraser-street and Camden-street, as well as from the roofdrum block. The shed is fitted with a safety Morris tube range, and another open range is provided in the shed. The main entrance of the headquarters block is from Fraser-street. On the ground floor is a room, 55 ft. by 24 ft., as a men's canteen, and also the commanding officer's room, the sergeant-major's room, and medical officer's examining-room. There are two staircases in the building, one leading to the men's and the other to the officers' quarters. On the first floor is the sergeant's messroom, 55 ft. by 24 ft. The officers' messroom is also on this floor, with ante-rooms, billiard-room, and honorary members' room. On the second floor is the gymnasium, 100 ft. long by 24 ft. wide. The kitchen and lavatory, with lifts, etc., are also on this floor, and here is situated a room to be used as a band-room and store-rooms are also above, while in the basement is a billiard-room with two tables for the men, the laundry and repairs-room, and so on. Here is the men's dressing-room, fitted with lockers, lavatories, and private lockers. The contractors were Messrs. Haigh and Co., the architects being Messrs. Woolfall and Eccles.

NEW INSTITUTE, BOURNE, SURREY.—The new institute premises which have been erected at Bourne were recently opened. The building is of brick, which is whitewashed outside, and has Roman tiles and a games room, and a reading-room. There are also rooms for the caretaker and the usual offices. The work was carried out by Mr. A. G. Mardon, architect, of Farnham, in accordance with plans prepared by Mr. H. S. Sidebotham, architect.

NEW INSTITUTE BUILDING, WHITBURN, SUSSEX.—The foundation-stone of a new institute for the village of Whitburn was laid a short time ago. The architects for the work were Messrs. Joseph Peck and Sons, of Sunderland, and the contract has been let for 1,203.

DR. ROBERT PURVIS, WHITBURN.

ASYLUM, BIRMINGHAM.—The new asylum for Lunatic Asylums Committee of the Birmingham City Council are erecting at Hollywell, at a cost of a quarter of a million sterling, is being built from the plans of the architects, Messrs. Martin and Bowen, by the contractors, Messrs. Bowen and Sons. The asylum is situated within half a mile of Rubery Railway Station. The building is constructed of red bricks which have been made on the spot. The place has been divided into blocks, communication being made by corridors. The administrative block is in the rear, and comprises the engineering department, kitchen, bakehouse, laundry, a dining-room, and recreation-room. The patients' quarters, on either side of the administrative block, have day-rooms and dormitories for the insane and epileptic on the ground floor, the day-rooms for the ordinary inmates being on the first floor above the day-rooms. Altogether the building provides accommodation for 302 males and a like number of female inmates. A small hospital for the special treatment of cases of infectious disease will accommodate half a dozen patients. There are also arrangements for the reception of patients and the convenience of visitors. The building also comprises a series of workshops for painting, upholstering work, shoemaking, carpentry, etc. A modern bakery will provide bread for the establishment.

MRS. BALSALL HEATH, BIRMINGHAM.—New arrangements to be erected at Balsall Heath for the Birmingham Corporation, from the designs of Messrs. W. Hale and Son. The buildings will comprise a first-class swimming-bath, 100 ft. by 55 ft. wide, having a water area of 32 ft., and dressing-boxes all round,

with a spectators' gallery over the latter on three sides; a second-class swimming-bath, 85 ft. 6 in. by 43 ft. 3 in., with a water area of 72 ft. by 32 ft., and open dressing spaces around three sides, and sixteen first-class slipper-baths for men, and six for women, and sixteen second-class for men, and eight for women. There are also nozzle and foot baths, and the necessary attendants' and waiting rooms, with one ticket office, having a separate access from each of the three entrances. On the first floor over the larger part of the women's baths there are a large club or committee room, and a smaller room, with lavatory, etc., adjoining. The estimated cost of the buildings is 20,000L., and that of the boilers and engineering works generally, which will be designed and carried out under the superintending engineer (Mr. J. Cox), will be about 7,000L.

MASONIC HALL, AVONMOUTH.—The new Masonic Hall at Avonmouth was dedicated on the 18th ult. by Sir Michael Hicks Beach, Bart., M.P. The hall occupies a central site in Portview-road. The building is in the Renaissance style, and of Shortwood bricks, with freestone dressing and a tiled roof. Provision is made for future extension in the shape of a kitchen on the ground floor communicating with the dining-room. Messrs. W. and J. Bennett, of Bristol, were the contractors, and the architect was Mr. J. A. Wright, of Bristol. The cost of the hall is estimated at about 2,000L.

LIBRARY, HARRGATE.—On the 17th ult. the Mayor (Alderman H. Milling) laid the foundation-stone of the new free library which is to be built at Harrogate at a cost of 8,000L. The free library is the first portion of the municipal buildings, and forms the western end of the frontage to Victoria-avenue and Raglan-street. The entrance is from Victoria-avenue into an entrance hall, which also forms the space for borrowers from the lending library. Leading direct from the entrance hall is the news-room, 50 ft. square, and lighted both by windows and from the top. This room will afford accommodation for about 200 readers. The lending library will provide shelving for about 40,000 volumes. In the half-basement is a large boys' reading-room, 30 ft. by 22 ft., also book stores, heating chamber, etc. On the first floor there are a reference library and magazine-room, 44 ft. by 22 ft., book stores, and librarian's room. The latter has been so arranged as to be suitable for a committee-room. The elevations of the building are to be faced entirely with stone from the Pateley Bridge quarries. This, however, does not apply to the walls on the eastern side of the building, which, when the municipal buildings are erected, will become an internal wall, and is, therefore, of plain brick. The floors and staircases throughout are of fireproof construction. Mr. H. T. Hare is the architect.

WESLEYAN CHURCH, GILLINGHAM, KENT.—The opening services of the new Wesleyan church in Byron-road took place recently. Mr. Nash was the architect for the work, the builder being Mr. Woodard.

HOSPITAL, DENBY MAIN.—On the 22nd ult. the foundation-stone of a new accident hospital was laid at Denby Main. The plans were prepared by Mr. H. L. Smethurst, and the work of erection is in the hands of Messrs. B. Wortley & Sons, builders, Doncaster. The contract has been divided into two parts, so that the hospital may be utilised as speedily as possible. The first erected will have accommodation for six to eight beds, with usual offices, etc., connected. The contract price for the whole is 2,447. 11s. Wards, nurses' room and observation chamber, recreation-room, board-room, operating theatre, and usual accessories will be provided, and in addition a caretaker's and nurses' home adjoining. The hospital will be warmed by Shorland's patent Manchester stoves, the floors throughout of marble mosaic, with adamant plaster and walls, with the exception of operating theatre and bathrooms, which will be covered with glazed tiles.

TOWN HALL, LEIGH, LANSHIRE.—The foundation-stone for the Town Hall for Leigh was laid on the 24th ult. by the Mayor. The site which was acquired by the Corporation some years ago in connexion with an improvement scheme, is in the centre of the town. The building will be English Renaissance in style. The main entrance to the hall will be in Market-place, and the building will have frontages in Market-street and Newton-street. The total cost is estimated at 40,000L., and 10,000L. of this represents the cost of the site. Mr. J. C. Prestwich, of Leigh, is the architect.

EXTENSION OF DUMBARTON COTTAGE HOSPITAL.—On the 21st ult. an extension to this hospital was opened, and a bust to the late John MacAusland, of Kirktonhill, which has been placed in the corridor, was unveiled. The

extension was designed by Mr. James M. Thomson, the architect of the original building, and includes a ward for children, two wards for cases of serious injury and private patients, and an operating-room. The cost has been something like 2,000L. The bust of Mr. MacAusland, who was the founder of the hospital, is by Mr. W. G. Stevenson, architect, Edinburgh. It is in bronze.

TRAMWAY OFFICES, GLASGOW.—On the 25th ult. the Tramways Committee inspected their new offices, situated at the corner of Kenfield-street and Bath-street. The area occupied by the building is 609 sq. yds., the building itself being 93 ft. high. The architect was Mr. John Baird, Glasgow.

HOSPITAL, AUCKLANDS, DURHAM.—Mr. W. Perkins, the architect for the Helmingrow Hospital, reported to a meeting of the Auckland, Shildon, and Willington Joint Hospital Board recently, that that building had cost a total of 9,034L.

INFIRMARY FOR CHILDREN, LIVERPOOL.—The foundation-stone has just been laid of the new Liverpool Infirmary for Children. The main structure will occupy the site of the old infirmary at the corner of Myrtle-street and Mulberry-street. Messrs. Haigh and Thompson, architects, of Liverpool, have designed the new building. In all there will be accommodation for 100 cots in five wards, three of which will be for medical and two for surgical cases. The ward pavilions are planned to recess and radiate to a centre, to which will be joined a department to be utilised for facilitating supervision and observation. The triangle formed by this recessing and radiating of the ward pavilions will front to Myrtle-street. Internally, accommodation will be provided for three resident medical officers, with the customary sitting and dining rooms. Suitable quarters will be set apart for the matron. Provision is also to be made for a small observation block, where doubtful cases can be treated until they have been diagnosed with certainty. In this section there will be three wards, each capable of accommodating two cots, with separate bedrooms for the nurses. The kitchens and larders are arranged on the top floor, to which access will be obtained by an electric lift. In connexion with each ward there will be a clinical-room. In another part will be located a pathological-room, an operating theatre, sterilising and anaesthetic rooms, and a photographic studio, and also, in the basement, an X-rays room. In convenient situations, also, are the dispensary and the porters' quarters. The ward pavilions are rectangular in form with rounded ends. The floors will be paved with terrazzo. All the internal angles of the building will be rounded, and the walls of the wards will be tiled dado high. The building will be of common bricks with red Ruabon brick bands and window jambs, and stone heads and sills.

FREE LIBRARY, NEWBURY.—A new free library is to be erected at Newbury from the plans of the Borough Surveyor, Mr. S. J. Lee Vincent. The façade will be built in red bricks, with Monks Park stone dressings, and roofed with Broseley tiles. The entrance lobby will allow of three or four newspaper stands. The lending department will be screened from the hall or corridor by a screen of Muranes glass, and accommodation will be afforded for 10,000 volumes. The reading-room will be 45 ft. by 30 ft., and will be lighted by an east window and clerestory windows.

COUNTY BUILDINGS, MID-LOTHIAN.—The new buildings which have been erected in Parliament-square, Edinburgh, by Mid-Lothian County Council on the site of the old building were opened on the 26th ult. by Sir James Gibson Craig. The council chamber is 45 ft. long by 30 ft. wide. Mr. J. Macintyre Henry, Edinburgh, is the architect.

BUSINESS PREMISES, DUBLIN.—New premises have been erected in Suffolk-street for Messrs. Walpole Brothers, Ltd. The work was designed by Mr. Charles H. Ashworth, architect, and the general contractors are Messrs. J. & P. Good, Ltd.

BARRACKS, BORDON, HAMPSHIRE.—The new barracks which are being erected at Bordon for the Royal Field Artillery are now nearing completion. The buildings comprise six brick-built battery barrack blocks, each to accommodate 156 men, and severally connected by a covered way to their own dining-hall, cook-house, wash-up, bath, stores, etc. There are eighteen troop stables, each to accommodate thirty horses, with harness-rooms, etc. There are also two blocks of gun and wagon sheds, each 350 ft. long and 40 ft. wide. Other buildings, all brick built, are the forage barns and corn stores, mobilisation equipment stores, etc. A riding-school and adults' and infants' schools are also provided, besides the recreation establishments. In addition, there are quarters for 105 married soldiers' families.

The officers' quarters are all detached, as also is the officers' mess establishment, which has a frontage of over 200 ft. The contractors are Messrs. T. J. Hawkins & Co., and the work has been carried on under the supervision of Colonel W. Staveley Gordon, C.R.E. Longmoor, Mr. A. C. Gillman acting as clerk of the works.

HOSPITAL, CREWKERNE.—The Crewkerne Hospital, erected to the memory of her late Majesty, was opened on the 19th ult by Sir Frederick Treves. The building has cost about 3,500l. The architects were Messrs Young & Hall, of London.

STAINED GLASS AND DECORATION.

WADSWORTH CHURCH, DONCASTER.—A three-light stained-glass memorial window has been erected in this church. The subject illustrated is the Ascension, which occupies the three openings, while in the tracery above appears the Hand of God, the Holy Ghost as a Dove, Cherubim, and the Martyr's Palm Branch and Crown. The work has been designed and executed by Messrs. Powell Brothers, of Leeds.

PROFESSIONAL CROSS FOR NEWCASTLE CATHEDRAL.—A new professional cross has been presented to Newcastle Cathedral by the Rev. T. E. Crawhall, Vicar of Tynemouth, in memory of his parents and other members of his family. The gift consists of a Latin cross of solid silver, with a trefoil at the end of each arm, and a quatrefoil at the crossing. In these five spaces are the usual emblems of Our Lord and the Evangelists. The arms of the cross are covered in front with a simple pattern in cloisonné enamel, in which the cross form recurs. Around the edge are small Wadsworth crystals, projecting outward, and set in foliated settings. At the top of the staff is a hexagonal knob, and above that a figure of St. Nicholas under a canopy, supported on six columns. The canopy is roof-like, with open tracery and pinnacles all round. St. Nicholas, who holds the crozier, and is in the act of giving the Benediction, has before him the three children in the tub—his usual symbol. The work was executed by the Handicrafts Company, Newcastle, an offshoot of the Newcastle School of Art.

APPOINTMENTS.

BIDEFORD.—On the 28th ult. the Bideford Town Council met for the purpose of confirming the appointment of Mr. R. E. L. Hookway as Borough Surveyor. After some discussion the appointment was confirmed. There were two other candidates for the post.

SANITARY AND ENGINEERING NEWS.

SEWAGE DISPOSAL WORKS, HALTON.—An application by the Rural District Council of Hunslet for the sanction of the Local Government Board to their borrowing 2,500l. for extending and improving their sewage disposal works at Halton, in the parish of Temple-newsam, was the subject of an inquiry which took place on the 25th ult. at the Halton Institute, by Mr. H. Percy Boulton, M.Inst.C.E., an Inspector of the Local Government Board. In February, 1903, the Sanitary Committee instructed their Engineer, Mr. S. Shaw (of Messrs. C. H. Marriott, Son, & Shaw, Dewsbury), to prepare plans and estimates for extending the works. The scheme consists of provision for storm water and for precipitation of the sewage in settling tanks, then for bacteriological treatment of primary and secondary beds, the effluent afterwards passing over about 4 acres of land.

MANCHESTER WATER SUPPLY.—It is announced that the testing of the second pipe from Thirlmere has so far been completed that it will be brought into use at once. The full service of 10,000,000 gallons a day will not at first be available, but it is hoped that before long this quantity will be placed at the service of the citizens.

EXTENSION OF PAISLEY WATER SUPPLY.—The inauguration of the completion of the additional water pipe laid between the burgh of Paisley's waterworks at Camphill, near Largs, and the Rowbank reservoir, and which also marks the completion of the burgh's water scheme, took place on the 29th ult. The piping from Camphill is capable of delivering 20,000,000 gallons of water every twenty-four hours, and the daily consumption in the town is, 8,000,000 gallons, though the existing pipes between the town and the filters can deliver 25,000,000 gallons in the twenty-four hours. The total cost of the work in connexion with the new piping is 290,000. The work has been carried out under the direction of Mr. James Lee, C.E., the burgh master of works.

SEWAGE DISPOSAL.—The Royal Commission on Sewage Disposal on Friday, the 28th ult.,

paid a visit to Market Drayton, where the system in use for part of the town of Market Drayton (about 1700 population) is continuous filtration by means of Ducat's Aerating Bacterial Filter. This is the only filter of this description in the country which has been constructed beyond the experimental size of those at London. It was installed about a year and a half ago for the Rural District Council of Drayton by Mr. G. A. Craig. Up to date it has done its work well.

FOREIGN.

GERMANY.—The new Technical Schools at Dantzig were opened on October 6; the building has been designed in the style of the ancient architecture of Dantzig, by Herr Egger and Herr Thür, and under the direction of Herr Carsten. The new theatre at Thorn, by MM. Fellner and Helmer, was opened on September 30. The Castle Vaduz at Lichtenstein, which was utilised as barracks until 1866, is to be completely restored. The Court Theatre at Brunswick has been rebuilt, and is now again in use; the work has been entrusted to Herr H. Seeling. Professor Gabriel von Seidl has been commissioned to design the new Historical Museum at Speyer. The buildings for the Art Exhibition of 1905 at Cologne are to be designed by Professor Hermann Billing, of Karlsruhe.

AUSTRIA.—The new homes for students in connexion with the High Schools at Vienna are now in use. The new baths at Karlsbad are being erected according to the plans of Professor Ohmann and Herr Hoeheder, and will cost 1,500,000 kronen. The memorial to the Empress Elizabeth at Kahlenberg was unveiled on October 13; the work was executed by the architects, Oskar and Engel, Felgel, and the sculptor, Rudolf Bachmann. The architect, Josef Prokop, died at Weidlingau, near Vienna, on October 8, in his sixty-fifth year. The new Botanical Institute, in connexion with the Vienna University, is completed; the building was designed and carried out under the direction of the engineer, A. Falkenau. Professor v. Zumbusch, of Vienna, has been commissioned to execute a memorial to Gottfried Schimper, which is to be placed in the Historical Museum at Vienna.

BELGIUM.—Tenders have been invited for the construction of two bridges over the river Dyle, at Malines, for the use of the railway from Malines to Antwerp. The estimated cost is about 14,500l.

MISCELLANEOUS.

BETTERMENT.—Mr. James Green (of the firm Weatherall & Green), who was appointed by the Local Government Board to make the necessary initial valuation of the property scheduled by the London County Council and alleged to be benefited by them, situated at the junction of Hampstead-road and Tottenham Court-road with Euston-road, has published and duly lodged with the Council his award pursuant to the Act of Parliament.

HADDON.—H. Cheetham, the author of the excellent little book on Haddon Hall, reviewed in our last issue, writes that the reviewer of the book seems to imply that it had no index, whereas the author had taken a good deal of trouble in supplying an index. We have not the book before us at the moment, but we have no doubt Mr. Cheetham is correct, and that the reviewer either overlooked the index, or inadvertently implied what he did not intend to imply.

GLASGOW BUILDING TRADES EXCHANGE.—The annual meeting of the Building Trades Exchange of the City and District of Glasgow, Ltd., was held in the Exchange, Hope-street, on the 26th ult. Mr. James Goldie presiding. Mr. David Cook, secretary, read the report of the Executive Council, which stated that there had been a profit of 42l. 7s. on the year's working. The chairman, in proposing the adoption of the report, remarked on the increase of unoccupied houses in Glasgow. Last year the number was 3,600, while in the latest return the empty houses were given as numbering 8,300, which meant the housing of about 40,000 persons. Referring to the report of the Housing Commission, he drew their attention to the fact that the result of the recommendation of the Commissioners to the Town Council was that their building operations should be restricted to building an experimental tenement for what they called respectable poor people, and also for building a shelter for "undesirables." They (the Trades Exchange) recommend that, if these buildings are gone on with, that no money should be borrowed, but that the money at present borrowed which was being spent on building warehouses and shops should be used. He warned them that although the City Improvement Trust was checked in the meantime from building, as

soon as they exhausted the money they would be at it again. They seemed to be like with a building fever—nothing would do them if they had money. Colonel Be seconded, and the report was adopted.

ARBITRATION CASE: BARRY LIBRARY DISTRICT.—Mr. Edwin W. M. Corbett, surveyor, District Council, at the Park Hotel, Cardiff, recently arbitrated, to hear evidence in the dispute between the Barry District Council and the Libraries Committee, on the one hand, and Mr. Watkin Williams, builder, on the other, as to alleged faulty construction of the foundations of the Carnegie Public Library buildings at Barry Dock. Mr. B. Francis Williams, K.C. (instructed by Mr. T. B. To clerk), appeared for the District Council Libraries Committee; and Mr. Abel Thomas, K.C., M.P. (instructed by Messrs. W. Davies & Co., solicitors, Pontypridd), Mr. Watkin Williams, Mr. C. E. Hutchings, London, one of the architects, was examined at considerable length to show that in instances the concrete foundations of building were laid on loose made earth, not sunk to rock bottom. The building far as it had proceeded was about 1 ft. square, and this disfigurement and the natural defects in the foundations were his opinion, sufficient justification for carrying down, carry out the foundations as specified, and re-erect the structure. The afternoon sitting was taken up by the contract cross-examination of Mr. Hutchinson, but the conclusion of which the inquiry was adjourned till November 10.—*Western Mail.*

THE PARISH CHURCH, PORTSMOUTH.—The parish church dedicated to St. Thomas Becket, in the High-street, which has been closed during some while past for repairs, improvements under the direction and superintendence of Mr. T. G. Jackson, R.A., was reopened on November 8. Mr. Jackson has made the designs for a sounding-board for the old pulpit—a structure after "three-decker" type—which is being made of old oak from the timbers of H.M.S. *Tremendous* that played its part in Howe's victory on June 1, 1794, and was subsequently renamed the *Granada*; the mounted portions of the sounding-board consist of wood from other famous ships, including the *Victory*, *Chesapeake*, and *George*.

THE BRADLEY MEMORIAL, WESTMINSTER ABBEY.—The memorial to the late Dean Bradley which the Dean and Chapter placed in the Abbey consists of a brass upon his grave at the west end of the choir of the nave. The brass was executed by Messrs. Barkinton & Krall, from a design by Mr. John Clayton, who followed, for general conception, the brass of Dean 1560-1, who was buried in the Chapel of Benedict. The late Dean, wearing a mitre with the chain and jewel of the Order of Bath, is depicted as holding the Coronation chalice; in the four corners are the heraldic shields of St. Peter's Collegiate Church, Marlborough College, University, Col. Oxford, and St. Edward the Confessor. The inscription beneath the figure commemorates Dr. Bradley's tenure of, in succession, headmastership of Marlborough, 1853-72; mastership of University College, 1872-81; the Deanery of Westminster, 1881-1902.

SCOTTISH BUILDING TRADES' FEDERATION.—The annual meeting of the Scottish Building Trades' Federation was held on the 28th ult. in the Imperial Hotel, Aberdeen. Mr. J. Morgan, builder, Aberdeen, presided, and delegates were present from Edinburgh, Inverness, and other parts of Scotland. William Macdonald, builder, Inverness, appointed president of the Federation for the year; Mr. Patrick Knox, Edinburgh, president; and Mr. Frederick A. Inverness, Inverness, secretary and treasurer. It was resolved to hold the next meeting of the Federation at Inverness.

MEMORIAL STATUE, BRIGHTON.—On the 21st ult. the memorial to the officers and men of the Royal Sussex Regiment, who fell in Africa during the late Boer War, was unveiled at Brighton. The monument, which is situated at the south side of Regency-square facing the entrance to the West Pier, is 10 ft. in height. It is composed of Portland stone and the badge of the Royal Sussex Regiment, the memorial tablets and the railings to enclose the whole, are of bronze. The statue is surmounted by a bronze statue, 7 ft. 6 in. in height, of a bugler of the Regiment. The bronze figure is by Mr. G. Hartwell. The monument has been carried out from the drawings of the architect, John W. Simpson, of Gray's-inn, London, W.C.

OLD LONDON.—The Essex House Press about to issue monographs on two fine London buildings:—Brooke House, Hack-

itten by Mr. Ernest A. Mann, and illustrated with reproductions of engravings of the use by W. Hollar (1642), Chatelain (1750), and Malcolm (1797); and St. Dunstan, Stepney, illustrated by the Hon. Walter C. Pepsy, with designs by Mr. Ernest Godman, architect, and illustrated with photographs, drawings, and hand-coloured prints of the more important heraldic shields in the church.

EDMUND KEAN MEMORIAL TABLET, RICHMOND, SURREY.—This was recently removed from its position on the outside of the west wall of St. Dunstan parish church owing to the dilapidated state it had fallen into through exposure to the weather. It is now to be re-erected in the interior of the church on the west wall, and as far as possible on the same site. Before the tablet is re-erected it will be cleaned and restored under the direction of Thomas Brock, R.A.

MEMORIAL WEST SMITHFIELD.—At the church of St. Bartholomew the Great, on the north side of the church, a tablet was unveiled in the late Mr. Joseph Grimshiro. The memorial consists of a stone tablet designed by Mr. O. Webb, R.A., bearing an inscription.

STREET IMPROVEMENTS, RICHMOND, SURREY.—A special meeting of the Richmond Town Council was held on the 21st ult., to consider the recommendations of the Street Improvement Committee as to the proposed Red-Lion-street area improvements. After some discussion it was decided to apply for a provisional order.

BRITISH STANDARD SECTIONS OF RAILWAY TIES.—A report issued last week by the Engineering Standards Committee contains the British Standard Specification and Sections of "Headed Railway Rails," drawn up by the committee of the Committee on Rails appointed in October, 1901.

In commencing this sub-committee wisely sought the assistance of the chief railway companies of the United Kingdom and were thus enabled to obtain particulars with regard to the sections favoured by modern practice. After full consideration of the data collected, the committee prepared a series of tentative drawings, which were submitted to the principal railway companies for comment. After receipt of all the replies, the preliminary standards were finally settled, a work in which much valuable assistance was given by Mr. C. Inglis, chairman of the sub-committee, and Chief Engineer of the Great Western Railway. A similar course was adopted with regard to the specification for the same class of rails, but in this case it was necessary to consult the leading manufacturers, as well as the various railway companies. The specification, which consists of nineteen clauses, appears to provide fully for insuring the use of suitable steel, for the adoption of the correct methods of manufacture, and for the proper finish of the completed rails. While the interests of the purchaser are adequately considered, we are glad to say that the results will be obtained without any vexatious regulations of the kind which have too frequently been imposed in the past by some speculators. In clause 14 provision is made for impact test of one rail from each cast, the test to comprise two blows from a one-ton weight, the drop ranging from 5 ft. to 7 ft. for the first and from 10 ft. to 20 ft. for the second blow. These blows must be sustained without fracture and without exceeding certain defined limits of deflection. The next clause specifies the required tensile test, in which the steel must show an ultimate strength equivalent to not less than 38 tons per sq. in., more than 45 tons per sq. in., with an elongation of not less than 15 per cent. upon a new standard test piece "C" or "D."

The rails are to have a brand rolled on the end of the brand including the distinctive mark of the Engineering Standards Committee, the number of the "B.S." section initials denoting the process of steel manufacture, the maker's name, initials, or mark, and the date of manufacture, and the number of the cast is stamped in 2-in. letters at the end of the rail. Further, after acceptance, all rails to be stamped in the presence of the inspector or his engineer. The brand marked above will no doubt be found very useful for the purposes of identification and the stamped inscription as a lasting proof that the rail has satisfactorily passed all required tests. At the end of the pamphlet there are plates giving full dimensions of the rails, a diagram, and nine full-sized drawings representing the new sections, which range in weight from 60 lb. to 100 lb. per yard, with rails of 5 lb. between each size. An appendix at the end of the report illustrates the British Standard tensile test pieces. The size in number, and are designated by letters. Thus, "A" with a total length of 8 in., and a gauge length of 8 in., is intended for plates and other structural material; "B" with enlarged ends and parallel for a length of not less than nine times the

reduced diameter and a gauge length of not less than eight times the diameter, is designed for bars, rods, and stays; "C" and "D" are for tyres, axles, forgings, and castings, the gauge length of "C" being 2 in. and of "D" 3 in., and the sectional area $\frac{1}{4}$ sq. in. and $\frac{1}{2}$ sq. in. respectively; "E" is similar to "C" and "D," but of larger dimensions. As in the case of all the previous publications of the Committee, this report is distinguished by the admirable lucidity of the phraseology employed, and the excellent manner in which the drawings are reproduced.

THE MANCHESTER INFIRMARY.—The Board of Management of the Manchester Royal Infirmary met on the 21st ult. The minutes of the Building Committee stated that the Committee had been in consultation with the architects for the new infirmary (Messrs. Hall & Brooke) as to the suggestion made by Sir James Hoy that, in order to expedite the payment of the Corporation's instalments of the purchase-money for the Piccadilly site, the contracts for the new buildings at Stanley-grove might be so let that vacant possession of the old site could be given to the Corporation when accommodation for 300 beds had been provided and before the completion of the whole of the new buildings. In reply to the Committee's inquiries as to whether some portions of the buildings could be postponed without increasing the cost or seriously delaying the completion of the whole, the architects pointed out to the Committee that, owing to the fact that the new hospital will consist of forty buildings, the mere postponement of some of them would not expedite the completion of the remaining buildings. They suggested that the most practical and practicable course would be to let the contract for all the buildings, and while stipulating that they should all be completed at the earliest possible date, to lay down the condition that all the Oxford-road blocks, the casualties, patients', and laundry blocks, and all the surgical side should be finished at a given date, and the remainder at a later date. In this way it might be found possible temporarily to use some of the surgical pavilions for medical cases.—It was also reported that Mr. A. Simpson, a member of the Board of Management, had written urging the Committee to consider the advisability of delaying the contracts except those for the buildings which were essential for providing for the three hundred patients now in the infirmary. As the Corporation would press the Board to vacate the present site at the end of three years, Mr. Simpson suggested that only the surgical blocks, the administration blocks, the nurses' home, and the laundry should be completed, and that the remainder of the work should wait.—The Committee resolved, however, that in view of the architects' belief that the completion of the new infirmary would be expedited by proceeding with the whole of the buildings, and their assurance that the infirmary could be completed within three and a half or four years from the date of commencing the foundations, the preparation of the contracts for the foundations should be proceeded with.

CANALS.—The Mansion House Association on Railway and Canal Traffic has arranged to convene a meeting of traders early in December for the purpose of considering the proposals of its executive committee for placing canals and inland navigations under the control of one authority and the advisability of seeking legislation to that end in the next session of Parliament.

PROPOSED MUNICIPAL BUILDINGS, GUILDFORD.—In our last issue, page 447, we refer to "Proposed Municipal Buildings, Guildford." We are informed that this is an error, and that the municipal buildings in question are those for Woking, the plans being prepared by Mr. G. J. Woodruff, Surveyor to the Urban District Council, Woking.

CEMENT FOR NATAL AND CAPE COLONY.—An official return shows that during the year 1903 cement was imported into Natal from the United Kingdom to the value of 26,100*l.*, and from Germany to the value of 32,300*l.* Respecting the first shipment of American cement to the South African market, the late correspondent of the Board of Trade at Port Elizabeth, Cape Colony, now reports that the importer of this cement has written to him as follows:—"The American cement has arrived and is all right. If freights continue as at present, we shall get some more."

FIRE TESTS WITH PARTITIONS.—No. 83 of the publications of the British Fire Prevention Committee contains the statistics of a test on a "Kulm" partition, formed of slabs tested by the maker to be composed of pumice stone, volcanic sand, and Portland cement. The partition was built of slabs of this composition 21 in. by 11½ in., and 2½ in. thick, the horizontal joints grooved and tongued, the vertical joints merely butting. On the side next the

fire the partition was plastered with a mixture of fireclay, sand, and plaster of Paris. After exposure to a two hours' fire some of the plaster was damaged—this appears to have been done mainly by the force of the water which was turned on immediately after the fire; but the joints were perfect.

Legal.

CASE UNDER THE PUBLIC HEALTH ACT.

THE case of Millard v. Balby-with-Hexthorpe Urban District Council came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 23rd ult., on the appeal of the District Council from a decision of a Divisional Court of King's Bench, consisting of the Lord Chief Justice, and Justices Wills and Kennedy, on February 29 last, reversing a decision of the Justices of the West Riding of Yorkshire on a complaint preferred by the Urban District Council for non-payment of paving expenses under the provisions of the Public Health Act, 1875, in respect of premises in Carr Hill-road, Balby. (The case was reported in the Builder of March 5, 1904.) The facts of the case were as follows:—In June, 1899, Carr Hill-road, not being a highway repairable by the inhabitants at large, the Council served on Millard, and all the owners of premises fronting such parts of it as required to be paved, notices requiring them to have the work done. The owners not doing the work the Council did it, and completed the work on December 4, 1901, at which date Millard owned premises on the road which required to be paved. On March 20, 1902, Millard sold his premises, the conveyance to the purchaser being executed on April 25, 1902. The Council's Surveyor apportioned 45*l.* as the proportion due from Millard for the work on his premises, and notice of apportionment was duly served on him on November 24, 1902. On May 20, 1903, a formal demand in writing was served on Millard for payment of the 45*l.* Millard contended that he was not liable because he was not the owner of the premises both on December 4, 1901, when the work was completed, and also on May 20, 1903, the date of the demand. The district Council, however, contended that Millard was the person liable for the apportioned expenses as he was the owner of the premises at the time when the works were completed. The Justices held that Millard was liable to pay the 45*l.* to the District Council, and made an order accordingly. The Divisional Court, however, on appeal, in deference to the decision in the case of the Queen v. the Swindon Local Board, reversed the decision of the Justices. Hence the present appeal of the District Council.

Mr. Macnaghten, K.C., and Mr. Joshua Scholefield appeared for the appellants, and Mr. Israel Davis for the respondents.

At the conclusion of the arguments of counsel the Master of the Rolls, in giving judgment, after stating the facts, said that the Court below had held, following the observations of the Court in the case of the Queen v. the Swindon Local Board, decided in 1879, and in deference to the opinion there expressed, though contrary to their own opinion, that Millard was not liable to pay the sum apportioned on him. In deciding the case it became necessary to consider sections 150 and 257 of the Public Health Act, 1875. Section 150 provided for the giving of notice by an urban authority to owners of houses fronting on streets not properly paved, requiring them to do paving works, and section 257 introduced the specific provision under which an owner came under liability, if he was liable at all. That section, in absolute and unambiguous language, defined the person who was the owner of the premises when the works were completed. In the present case Millard was the owner of the premises when the works were completed, and, on the language of the section, he fulfilled the conditions of liability. It was not necessary to decide the question whether, if a man who was the owner at the time of the notice made default, and then before completion of the work sold the premises to someone else, both would be liable. But it was clear that in the present case Millard was liable. Referring to the decision in the case of the Queen v. Swindon Local Board, his lordship said it must not be forgotten that there was an important distinction between that case and the present, for in the former case the person on whom the demand for payment was made ceased to be the owner before the completion of the works. He, therefore, clearly

did not come within section 257 of the Act. Therefore, the facts in the case of the Queen v. the Swindon Local Board did not raise the point involved in the present case. He thought the appeal should be allowed.

The Lords Justices concurred.

HERNE BAY DRAINAGE DISPUTE.

The hearing of the case of *Graham v. Ramuz* concluded in the King's Bench Division, before Mr. Justice Phillimore and a special jury on the 23rd ult.—an action by the plaintiff for damages against the defendant for alleged breach of contract.

The facts of the case were as follows:—The defendant, the owner of a building estate at Herne Bay, in October, 1893, sold by auction to Messrs. Nott, Cartwright, & Eccles some lots of land on the estate. On the front page of the catalogue were the words "Roads made, drained, and kerbed," and the catalogue contained the conditions of sale. No. 6 of the conditions of sale provided that 50s. per plot should be paid by each purchaser for the connexion of the drains with the sewers when the roads were made, and the sewers laid. The conveyance, which was dated October 1, 1900, contained no stipulations as to drainages, but it recited the agreement of sale. The roads were not included in the conveyance. The purchasers, in the following December, assigned their interest to the plaintiff. The plaintiff's case was that, by the terms of the conditions of sale, there was an agreement by the defendant to lay sewers for the proper drainage of the lots. Pipes for sewers had been laid, but no outfall had been provided owing to differences between the Urban District Council and the defendant. The plaintiff alleged that he was entitled to recover damages for the loss he had suffered by reason of his being unable to drain houses erected and to be erected on the plots, and to get the plans passed by the local authority.

Mr. Hohler and Mr. G. W. Ricketts appeared for the plaintiff, and Mr. H. F. Dickens, K.C., and Mr. C. Herbert Smith for the defendant.

In the result his lordship held, on the construction of the documents, that there was a warranty that there should be sewers, but left it to the jury to say whether they found it as a fact. The parties also agreed that the jury should be asked to assess the damage (if any) on the assumption that the sewers should be completed at once.

The jury found that there was a warranty in fact, and assessed the damages at 500l.

Judgment accordingly.

A stay of execution with the view to an appeal was refused.

THE BUILDING BY-LAWS, LEATHER-HEAD.

JOHN THORN, of Poplar-road, Leatherhead, was summoned at the Epsom Police Court recently for two breaches of the building by-laws in erecting a building not in accordance with plans sent to the Urban Council and approved by them, and also in building the walls not of the proper thickness as required by the description of the building erected. Mr. W. J. Hodges appeared on behalf of the Leatherhead Urban Council, and Mr. R. J. Clark, of Croydon, defended. Mr. Hodges said that the defendant submitted plans to the Council in May or June, showing that two stories were to be erected above the cellars, with the walls of the thickness of 9 in., as required. The plans were approved, but when the surveyor (Mr. Salkield) inspected the building he found that a room not shown in the plans had been constructed in the roof, and a staircase to it from the other stories was about to be erected. The room had windows, chimney, and fireplace, and a third story of which there was nothing shown on the plans was thus constructed. That addition, according to the by-laws, necessitated a thickness in the walls of 13½ in., whereas the thickness was only 9 in. The surveyor wrote to Mr. Thorn, asking him to state his reasons for departing from the plans, but no reply had been received, and the only course open to the Council was to take these proceedings. Mr. Clark said that defendant admitted the offences, but urged mitigation. When the erection of the house was almost completed, Mr. Thorn saw that some space had been wasted in the roof, and he decided to use it, without any intention to evade the by-laws, by constructing a room in which to store furniture and tools, as he proposed to occupy the house himself. He did not reply to the Council's letter, as he had previously written to the Council on another matter, and had received no reply. Defendant was perfectly willing to take down the staircase from the second story, so that the room could not be used as a bedroom or

living-room, and to give an undertaking to that effect. He asked the Bench to reduce the penalty considerably. Mr. Hodges said that that was the first time that any explanation of any kind had come from the defendant. He asked the Bench to impose the penalties as they thought fit, the matter of "taking down" to be considered by the Urban Council. It was for the Bench to deal with the two summonses before them. The maximum penalty for each offence was 5l. The Chairman (Mr. W. R. G. Farmer) said that it was a very serious case, especially in the varying of the plans. Defendant would be fined 4l. for departing from the plans, and 1l. for not erecting walls of the proper thickness, and all costs. Mr. Rostron said that such offences reduced provisions made in the interests of the public to a nullity.—*Surrey Advertiser*.

BOGNOR BUILDING BY-LAWS.

At Chichester County Bench on Saturday last, Charles John Mills, a carpenter and joiner, of Bognor, was summoned by Mr. H. L. Staffurth on behalf of the Bognor Urban District Council, for erecting on December 1, 1903, a wooden building without first delivering plans in accordance with the by-laws. Mr. Humphrys, barrister, instructed by Mr. Staffurth, prosecuted, and Mr. J. A. Morris Bew appeared for defendant, who pleaded not guilty.

Mr. Humphrys explained the case at length, and referred to the question of penalties, and he admitted, in reply to a remark by Mr. Bew, that if it were proved the building was erected more than a year ago he could not get any penalties.

Mr. O. A. Bridges (Surveyor to the Council) stated that the building was in course of erection in November last, but defendant, in evidence, said it was erected on September 19 and 21, 1903.

The Bench, however, thought there was not sufficient evidence that the building was erected on September 19 and 21, and the case must go on.

Mr. Bew then submitted that defendant was not charged with a continuing offence, and the limit of time to those proceedings being six months from the time the offence was committed, the case must on that ground be dismissed.

After considerable legal argument, Mr. Du Pre (Chairman) said the Bench thought the information did not sufficiently state the charge, and the present proceedings therefore failed. Replying to Mr. Humphrys, the Chairman said they would state a case if necessary.

The Bench proceeded to hear a summons against Arthur Davis, cycle agent, of Beach House, Sea-road, Bognor, for erecting and bringing forward an addition to a building beyond the front main walls of the houses on either side thereof at Bognor. Mr. Humphrys again appeared for the Council, and Mr. E. B. Wannop defended. It was alleged that defendant brought his shop windows out 2 ft. beyond the building line, and the verandah 2 ft. beyond the shop windows, making 4 ft. beyond the line.

The Surveyor and Mr. Staffurth having given evidence, Mr. Wannop submitted that the information was bad, because it did not disclose any offence whatever. It did not allege a continuing offence, and it was a continuing offence which brought it within the meaning of the Act.

The Bench decided that the information was good.

Mr. Wannop then contended that if the bays of the Beach Hotel next to defendant's building were taken as the building line, the whole of defendant's building was within the line.

Mr. Fletcher: The bays of the Beach Hotel do not extend to the ground?

Mr. Humphrys: No.

In giving the decision of the Bench, Mr. Du Pre said defendant was liable to a penalty of 2l. per day for 117 days, but they thought justice in the case would be met with a penalty of 6d. a day, and costs.—*Sussex Daily News*.

DISPUTE ABOUT A STONE CONTRACT IN BRADFORD.

Before his Honour Judge Bompas, K.C., at the Bradford County Court, on the 31st ult., an action was brought by Messrs. Parry & Proctor, quarry owners, of Bolton Woods and Eccleshill, Bradford, against Messrs. George Denham & Co., stone merchants, of Atlas Mills, Brighouse, for the value of stone supplied. The defendants set up a counter-claim on the ground that the goods supplied were not in accordance with contract, and that there had been a breach of a contract to supply 100 tons of stone cubes. Mr. Henry Waddington appeared for the plaintiffs, and Mr. G. F. Roberts for the defendants. In the

course of the hearing a question of course arose. On behalf of the plaintiffs it was contended that the general custom in the trade was for a contract to take a certain quantity of stone to be terminable on the customer taking what stone was ready at the quarry top. His Honour said that such a custom was absurd where there was a contract to take a certain quantity of stone. Eventually his Honour gave judgment for the plaintiffs on the claim, and for the defendant on the counter-claim, after reducing the amount of the latter.—*Yorkshire Daily Messenger*.

CLAIM AGAINST TIMBER MERCHANTS UNDER THE WORKMEN'S COMPENSATION ACT.

The case of *Middleton v. R. Wade & Co., Ltd.*, came before the Court of Appeal, composed of Lords Justices Stirling, Mathew, and Lord Macnaghten, on the 31st ult., on the application of the defendants that the plaintiff should be ordered to give security for the costs of an appeal from the award of the Justice of the Peace's Court of Kingston-upon-Hull, in a claim under the Workmen's Compensation Act, 1897.

Learned counsel, in support of the application, said that the County Court Judge had decided the case in favour of the defendant, and notice of appeal had been served, and had an affidavit in support of the application, sworn by a member of the defendant firm, in which he said that he believed the plaintiff in the case had no visible means of support, and therefore there was no prospect of the defendants getting their costs of the appeal proved unsuccessful. In the circumstances he asked for an order of security for the costs of the appeal. The learned Counsel for the plaintiff, in resisting the motion, said the accident was admitted, the defendants were timber merchants, and had contracted with the post office to supply telegraph poles, and dress them with creosote. Defendants had two yards, one yard connected with the other by a footpath, and in one yard there was machinery driven by steam, which made it a factory within the meaning of the Act. In the other, where the machinery was put on, there was no machinery. The point taken by the appellant was that the two yards were held by the defendant worked together as one business, and the whole had to be taken as one factory, that the accident occurred "in or about a factory," or within the curtilage of a factory. The learned County Court Judge held the place where the accident happened was not a factory because the two yards were contiguous, although connected by a footpath. A second point was that the learned Judge held that the yard where the accident occurred was not a warehouse within the meaning of the Act, because there was no roof. Those were the two points which the plaintiff wished to bring before the court, and he submitted they were substantial ones. He did not dispute that the plaintiff had no means of support, but he said that the plaintiff's husband, and the widow, were suing on behalf of herself and her two children for compensation under the Act. He should ask their lordships to make no order on the motion, or if they felt obliged to make an order for security, that they should do so on a small sum only.

Lord Justice Stirling said he thought an order for 10l. was enough.

Lord Justice Mathew concurred. Order accordingly.

WORKMEN'S COMPENSATION ACT.

At the Birmingham County Court, on the 27th ult., his Honour Judge Whitehorn gave judgment in the case of *William Henry Plumber, of 221, Malmesbury-road, Heath, against J. S. Wright & Co., plumbers and painters, Moor-street, Birmingham*. The case was an application under the Workmen's Compensation Act in respect of the injury sustained by the applicant while employed by the respondents in doing certain measurements up on the completion of the building of a factory. The applicant fell over a rail, broke his shoulder, the result being, he was unable to follow his employment for a period of thirteen weeks. The respondents contended that the applicant was not employed by the respondents to work as a plumber at the time of the accident, but was employed as a painter, and that the work which had previously been executed by the respondents was not being incidental only to his work. His Honour, in giving judgment for the plaintiff, said the whole question depended on the right meaning of the word "constructive" in the Act, and he held that the necessary measuring up of constructive work on which the applicant was engaged was

... occurred was part of the construction, and therefore the case was within the Act. He had not forgotten that the measurement of the work was not done until a night after the completion of the construction. There might be cases in which the interval of time was so long as to make it just to regard it as part of the construction, but such cases would have to be considered on their merits. He did not regard a night as an unreasonable time, and therefore he gave an award for £17, the amount claimed upon by the parties. On an application by Mr. Walthall, his Honour said the respondents had a right to appeal.—*Birmingham Mail*.

WORKMEN'S COMPENSATION ACT: QUESTION AS TO "ARISING OUT OF," ETC.

The Marylebone County Court on Friday week, before Judge Stonor, Frederick Cris, a plasterer, 5, Desborough-road, Paddington, W., applied for compensation under Workmen's Compensation Act, from Messrs. Owen & Crawley, builders, Newton-road, Bayswater, and 3, Pickersmeads, Westbourne-grove, W. The application was made in respect of personal injuries sustained by the applicant whilst in respondents' employ.

Mr. Macpherson, counsel, appeared for the applicant, and Mr. Cairns, counsel, for the respondents. The applicant stated that in May last he was employed by the respondents, assisting in a building operation in Bayswater. On May 12 he had been working upon a portico, in order to descend to the ground he requested that Mr. Owen—one of the respondents—should hold a long pair of steps such a position that he (applicant) might have a foothold as he clambered over the top of the portico. He requested that no one but Mr. Owen should hold the steps, and he called out "Hold tight—are you there?" Mr. Owen replied, "Right." The applicant, however, applicant put his right foot on the top of the steps they swayed one way and he fell the other way to the ground. The back of his skull was fractured, and at present time he was unable to do his ordinary work.

On cross-examination, the applicant denied deliberately jumped from the top of the steps.

For the defence, Alfred Gibbs, a painter, admitted that he was holding the pair of steps and the applicant was getting down from the portico. The steps were quite firm, and Mr. Owen guided the applicant's foot to the top of the step, but the man appeared to leap out from the steps, and he fell 3 ft. 9 in. from them.

The Judge: He lost his balance. I suppose it appears to have been an ordinary accident. Mr. Alfred James Crawley, of the respondents' firm, gave evidence similar to that given by the last witness.

Counsel for the respondents submitted that the accident did not arise "out of and in the course of the employment," and that, therefore, the applicant was not entitled to compensation under the Act. Surely a master cannot be held responsible for such a foolish and foolish act on the part of a servant as the act of which the applicant was to be guilty, when he leapt from the top of the steps.

The applicant, recalled, said that had the steps been held firmly, the accident could not have happened.

His Honour found in favour of the applicant the award being at the rate of 15s. a week.

INJURY THROUGH FALL OF COPING STONE.

In a case of *Musson v. Mardell* came before Justice Bucknill and a common jury in King's Bench Division on the 31st ult., in which the plaintiff against the defendant an upholsterer, and the tenant of premises in Westbourne-grove, to recover damages for personal injuries which the plaintiff had sustained through the defendant's negligence.

It appeared that the plaintiff on January 14 last went to the defendant's premises in order to make a purchase, and whilst there a coping stone fell through a glass skylight, striking her on the head, and seriously injured her. One of the shop assistants was killed, and many other people were injured. The premises in question were built about seventy years ago, and then consisted of a three-story building set back some distance from the street, a garden being in front. The garden, however, had been since built over, and a shop, which was a one-story building with a skylight running back to the street building. To provide communication

between the shop and the rest of the premises a part of the original front wall had been cut away, and a bressummer inserted to support the wall. The plaintiff's case was that the premises were not in a reasonably safe condition so far as care and skill could make them. The defendant's case, on the other hand, was that if there was a defect it could not reasonably be discovered, and he pleaded in the alternative that the fall of the coping stone was caused by a storm, and thus occasioned through an act of God.

After hearing evidence the jury, in the result, were unable to agree, and were discharged.

PATENTS OF THE WEEK.

APPLICATIONS FOR PATENTS.

24,017 of 1903.—D. B. DONSON and A. J. H. MOFFAT: *Sash Fasteners and Lifts for Windows*.

A fastening device for windows, consisting of a lever having two arms of unequal length placed at an angle to each other, one arm weighted at its free extremity, attached to a turning piece pivoted to flanges rising from a sole plate, with screw holes, or other means of attachment, and an operating pin or other projection of metal, which, in its simplest form, consists of a screw with or without a surrounding piece of metal tubing.

24,997 of 1903.—A. ROBERTSON: *Raising and Lowering Mechanism for Window Sashes*.

Means for raising and lowering window sashes, consisting of a rack on the sides or edges of the sliding sash, and a toothed disc meshing therewith, said rack being composed of a series of concave faces having notches between the faces, and said toothed disc being composed of convex faces adapted to engage concave faces on the rack, and of projections or teeth arranged to mesh with the notches aforesaid.

26,141 of 1903.—F. J. GIBBONS: *Door Hinges*.

A ball bearing for a door hinge in which the two enclosing race rings for the balls are united by an internal or external ferrule or sleeve by deadening the ends of the latter, characterised thereby that a recess is provided on the external surface of one of the race rings, which recess is adapted to receive therein a portion of the boss of one of the leaves of the door hinge.

26,384 of 1903.—H. E. BADENH: *Water-closets*.

A water-closet, consisting of a pottery basin of the pedestal type having a metal socket secured to its discharge outlet forming the seat for a valve pivoted in the metal discharge pipe.

26,410 of 1903.—J. BRIGGS: *Domestic Fire Grates*.

This invention relates to domestic fire grates, and it has for its object to economise fuel and provide a brilliant and cheerful-looking fire with a comparatively small quantity of fuel. For this purpose what may be termed a false grate is employed inclined from the back downwards towards the front, and before reaching the front inclined upwards. The grate bars in the back part of the false grate may be formed from the back downwards, and a longitudinal slot or slots may be formed in the upwardly-inclined front part of the bottom or at the junction of the two inclined parts. Feet may be provided at the ends to support the grate. Slide or filling pieces may be provided adapted to more or less close any or all of the openings in the above-described grate. These filling pieces may be supported on upper flanges or projections.

26,757 of 1903.—R. NIEMANN: *Tables*.

A drawing table having means for adjusting same, comprising adjustable supports on the posts of an end frame, the supports belonging to one side of the table intersecting, their lower ends being adapted to be adjusted in vertical guides in the posts, their crossing point being adapted to be secured by means of a clamping screw, so that by loosening the clamping screws upon both sides of the table top its degree of inclination may be altered without loosening the end screws of the supports, whilst by loosening these end screws the height of the table top may be altered without loosening the clamping screws.

27,148 of 1903.—C. E. LONG and P. J. WARDON: *Fastenings and Means for Locking the same, Applicable to Doors, Gates, Boxes, and other Articles*.

Fastenings for doors, gates, boxes, and other articles, consisting of a pivoted arm carried in a suitable casing on one part of the structure, the said arm having a curved lateral projecting rib or ribs on its free end, and

means for operating the arm about its fulcrum, in combination with a latch plate fitted on the other part of the structure, the said latch plate having a slot to receive the ribbed end of the pivoted arm, and curved grooves in the side walls of the latch-plate to receive the lateral ribs, together with means operated by a key for locking the arm in its engagement position.

2,477 of 1904.—W. T. GIBBS and A. A. GIBBS (Trading as Walter Gibbs & Sons): *Leaded Lights*.

The object of this invention is to strengthen leaded lights for windows, door panels, skylights, lantern lights, and the like, whereby the unsightly system of iron bars and copper ties on the surface of the lead are dispensed with. For the purpose of this invention embedded or enclosed within the lead used for making the leaded lights is a rod, bar, or tube of iron, copper, brass, or other hard metal, and of a round, square, angular, hollow tee, double tee, or other shape, the whole or a greater part of the rod, bar, or tube being covered by the metal forming the lead, the method of enclosure or partial enclosure being by soldering the two ordinary cans of lead together or the lead can be drawn or cast over the rods, bars, or tubes, or the embedding or partial embedding of the rods, bars, or tubes can be effected by any other method.

9,076 of 1904.—G. F. GILLON: *Window Sashes*.

This invention relates to window sashes, and has for its object to provide simple means whereby the windows can be opened inwardly to facilitate cleaning. The inner or room side of each sash is formed with a recess into which is fitted a wooden frame which is hinged to the sash. The windows are glazed within the said hinged frames; the arrangement being such that the outside of the windows can be turned inwards for cleaning purposes, without sliding the sashes up or down. The windows and frames may be secured or locked to the sashes, at the opposite side to the hinges, by means of ordinary window snibs, the sashes being locked by the usual fasteners. Storm plates may be used at the middle sash joint also at the top and bottom of the sashes, if required.

10,188 of 1904.—E. H. LUNKEN: *Construction of Windows*.

This relates to a window construction, consisting of a main frame composed of two members, one of which is secured to the wall of the building and adapted to carry a window part or parts, said second member being preferably of angle iron.

18,478 of 1904.—I. H. RANSON: *Key Building Brick*.

This invention consists of forming, during the process of manufacture of machine-made "wire-cut or pressed bricks," of one or more dovetailed, or keyed grooves, in one or more of the vertical sides, and ends of the said bricks.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

October 24.—By W. A. BLAKEMORE.	
Twickenham.—35 and 37, Northcote-rd., f., e.r. 50l.	5580
Clapham.—66, Hemberton-rd., u.t. 77½ yrs., g.r. 8l. 8s., e.r. 42l.	355
By BEARD & SON.	
Hoxton.—65, 65a, 67, and 69, Southgate-rd., with workshops in rear, u.t. 45 and 56 yrs., g.r. 4l. 10s., y.r. 250l.	2,000
36, Watson-pl. (s), u.t. 27½ yrs., g.r. 9l. y.r. 65l.	150
By BRADY, THOMAS & CO.	
Hampstead-road.—Stanhope-st., i.g.r. 61l., u.t. 20 yrs., g.r. 18l.	455
Camden Town.—Arlington-rd., i.g. rents 40l., u.t. 31 yrs., g.r. 4l.	485
Stratford-pl., i.g.r. 15l., u.t. 42 yrs., g.r. nil.	270
Kentish Town.—Lewis-st., i.g. rents 13l. 10s., u.t. 30½ yrs., g.r. nil.	190
Victoria-rd., i.g. rents 22l., u.t. 30½ yrs., g.r. nil.	320
Holloway.—Tytherton-rd., i.g.r. 48l., u.t. 62½ yrs., g.r. 4l.	875
Brixton.—Overton-rd., i.g.r. 21l., u.t. 57½ yrs., g.r. 4l.	390
By GREEN & SON.	
Shepherd's Bush.—69, Godolphin-rd., f., e.r. 45l.	590
By WAGSTAFF & SONS.	
Dalston.—70, Middleton-rd., y.r. 38l., also i.g.r. 6l., u.t. 34½ yrs., g.r. 10l.	305
16 and 18, Mayfield-rd., u.t. 16½ yrs., g.r. 7l. 15s., y.r. 64l.	440
Islington.—29, Oxford-rd., u.t. 37½ yrs., g.r. 4l. 10s., y.r. 34l.	275
Finbury Park.—22 to 32 (even), Praegerd., u.t. 41 yrs., g.r. 25l. 10s., y.r. 222l.	2,365
City Road.—34, 35, 39, and 40, Hall-st., u.t. 37½ yrs., g.r. 22l. 10s., y.r. 160l. 16s.	1,240
By WILTSHIRE & CO.	
Lewisham.—Nightingale-gr., a plot of freehold building land	150
By WOODS & SKELLING.	
Kennington.—10 and 11, Wynyard-ter., f., y.r. 78l.	700

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

Table with 3 columns: Description, Price, and Unit. Includes 'SLATES (continued)' and 'WOOD (continued)'.

Table with 3 columns: Description, Price, and Unit. Includes 'TILES' and 'WOOD'.

Table with 3 columns: Description, Price, and Unit. Includes 'WOOD' and 'JOISTS, GIRDERS, &c.'.

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Table with 3 columns: Description, Price, and Unit. Includes 'WOOD (continued)' and 'JOISTS, GIRDERS, &c.'.

Table with 3 columns: Description, Price, and Unit. Includes 'JOISTS, GIRDERS, &c.' and 'METALS'.

Table with 3 columns: Description, Price, and Unit. Includes 'METALS' and 'LEAD, &c.'.

Table with 3 columns: Description, Price, and Unit. Includes 'LEAD, &c.' and 'ENGLISH SHEET GLASS IN CRATES'.

Table with 3 columns: Description, Price, and Unit. Includes 'ENGLISH SHEET GLASS IN CRATES' and 'OILS, &c.'.

Table with 3 columns: Description, Price, and Unit. Includes 'OILS, &c.' and 'VARNISHES, &c.'.

Table with 3 columns: Description, Price, and Unit. Includes 'VARNISHES, &c.' and 'WOOD'.

Table with 3 columns: Description, Price, and Unit. Includes 'WOOD' and 'JOISTS, GIRDERS, &c.'.

Table with 3 columns: Description, Price, and Unit. Includes 'WOOD' and 'JOISTS, GIRDERS, &c.'.

Table with 3 columns: Description, Price, and Unit. Includes 'WOOD' and 'JOISTS, GIRDERS, &c.'.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is stated, nor any list in which the lowest tender is under 100l., unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

AYR.—Accepted for erecting new district asylum hospital, for the County Council. Mr. J. B. Wilson, architect, 92, Bath-street, Glasgow. Quantities by Messrs. Morrison & Mathieson, Glasgow: Mason & Brickwork: D. Kirkland, Ayr, £5,788 17 4; Wright: McLeod & Son, Dumbarton, 4,113 0 0; Plumber: Auld & Sons, Ayr, 2,115 0 0; Slater: Auld & Sons, Ayr, 804 1 4; Plasterer: W. Forbes, Glasgow, 1,039 12 0; Steel: P. & W. McLellan, Glasgow, 193 7 1; Tiler: Kenn & Wardrop, Glasgow, 483 2 5; Painter: Willock & Son, Ayr, 596 3 4; Ironmonger: J. Gibbons, Wolverhampton, 374 7 6. Total, £16,510 17 0.

BARKING (Essex).—For constructing light railways, for the Barking Town Urban District Council. Messrs. Hawtayne & Zeden, engineers, 8, Queen-street-place, London, E.C.:

Sections 1 and 1a, 2 and 2a, and 4 and 4a. T. D. Jackson, Rippled-road, Barking, £8,117 4 3. Sections 3 and 3a. Dick Kerr & Co., Ltd., Abchurch-yard, Cannon-street, E.C.4, 691 15 8.

BARKING (Essex).—For road improvement works, etc., in connexion with London-road improvement works, for the Barking Town Urban District Council. Mr. C. F. Dawson, Surveyor, Public Offices, Barking:—

Table with 4 columns: Contractor, Road Widening, Lovford Water Dams, Total. Lists various contractors and their bids for road and water works.

BECOL.—For forming, sewerage, and surface-water draining new roadway, to be called Fredricks-road, for Mr. N. W. Pells. Mr. Arthur Pells, architect and surveyor:—

Hindes & Co., £306 0 0; Hipperson Bros., £288 9 6; H. A. King, 299 15 6; G. Johnson, 259 7 8. [Architect's estimate, £271 10s.]

CARLTON-LE-WILLOWS.—For street works (Standard-hill-road, etc.) and laying sewers and drains, Carlton, near Nottingham, for the Urban District Council. Mr. J. C. Haier, Engineer and Surveyor to Council:—

O. Belshaw & Son, Nottingham, £5,195 16 6.

CARSHALTON.—For making-up Carshalton Park-road, for the Urban District Council. Mr. W. W. Oale, Surveyor, Carshalton. Quantities by Surveyor:—

R. O. How, £4,619 19 11; Forbes & Co., £7,468 7 2; E. H. Lee, 4,464 7 6; S. Leitch, 4,321 2 4; Kavanagh & Co., 6,068 14 5; J. B. Potter, 4,247 5 0; Lawrence & Thackery, 5,437 18 4; J. C. Trueman, 4,971 4 9; Swinley, 4,082 0 0; T. Adams, 4,971 4 9.

TENDERS.—Continued on page 477.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS

(For some Contracts, &c., still open, but not included in this list, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Desig bo D
*Design for Proposed New Building.	Governors of Alnwick Infirmary	100l. and 30l.	Jan.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Ten be D
Steel Lancashire Steam Boiler	Limerick District Lunatic Asylum	Medical Superintendent, at Asylum	No
Valve House at Gas-holder Station, Swilley	Devonport Corporation	Stevenson & Bursell, Engrs., 38, Parliament-st., Westminster, S.W.	No
1,730 ft. of Dwarf Walls, etc., Goswell Pleasure Grnds.	New Windsor Corporation	E. A. Stickland, Borough Surveyor, Alma-road, Windsor	No
Sewering, Paving, etc., Ardwick	Manchester Paving, etc., Committee	Paving, etc., Dept. (Surveyor's Office), Town Hall, Manchester	No
Drainage, etc., Chodlon-on-Medlock	do	do	No
Road Works, Horns-road, Buntingford Bridge Hill	Ilford U.D.C.	H. Shaw, Surveyor, Public Offices, Ilford	No
Villas and Terraces of Houses, Douglas, Glasheen, etc.	Mr. T. Donovan	W. H. Hill & Son, Architects, 23, South-mall, Cork	No
Motor-car and Cycle Works, Chester-street, Wrexham	Kingston Bowling Club Co., Ltd.	44, Hope-street, Wrexham	No
Peavillon, Hall,	do	do	No
Shed at Coates, Barnoldswick	do	S. Slater, Frank-street, Barnoldswick	No
Road Works, Grey-street, Princes-street, & Back-la.	Tynemouth Corporation	J. F. Smillo, Borough Surveyor, Tynemouth Corporation Offices	No
Road Materials	Woodbridge R.D.C.	G. Cook, District Surveyor, Grandisburgh, near Woodbridge	No
*Asphaltic Paving, Wk. at rear of Station-rd., Haiesden	Willesden B.C.	Mr. Lobbson, Eife Estates Office, Keith	No
Making-up Fulwich-street	Dartford U.D.C.	T. E. Tith, Surveyor, Council Offices, Dartford	No
Alters, and Adds, to Manchester Hotel, Bridlington	Mr. C. J. Yardley	J. Barnshaw, Architect, Wellington-road, Bridlington	No
Alterations at Workhouse, Aricoe, Ireland	Guardians	L. Turley, C.E., 17, Laurence-street, Drogheda	No
Sewer and Branch Drains to Houses, Princes-place	Bridgewater Town Council	Borough Surveyor, Municipal-buildings, High-street, Bridgewater	No
Rebuilding Two Shops and Two Residences, Strabane	Mr. J. Dunn	Glanmoy County Asylum	No
Motors and Tramway Boosters	Preston Tramways Committee	W. H. Tittensor, Engineer, Power Station, Holmrook-rd., Preston	No
Hyndburn Park Council School	Acrington Education Committee	A. J. Shaw & T. H. Vowles, Archts., 60, St. James-st., Burnley	No
40,000 Machine-made Solid Compressed Bricks	Belfast Cemetery Committee	S. Black, Town Clerk, Belfast	No
Lodge and Gates, Angleton Asylum, Bridgend, Glam.	East India Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	No
Beater Picks, Shovels, etc.	do	do	No
Wood, Screws, Nails, etc.	do	do	No
Canvas, Bunting, etc.	do	do	No
Fibrebricks and Fireclay	Tynemouth R.D.C.	J. Waters, District Surveyor, Long Benton	No
Cement Concrete Kerb & Paths, Forest Hall Pub. Rd.	Derby Education Committee	A. Macpherson, Architect, Tennant-street, Derby	No
Gie's School, Brighton-road	Ware U.D.C.	O. H. Gibby, Clerk, Town Hall, Ware	No
Public Lighting, Ware	Mr. J. Chinn	H. Hurd, Town Surveyor, Council Offices, Broadstairs	No
Stables, etc., Clarence Hotel, Pontypool	Hull Corporation	J. S. First, City Architect, Town Hall, Hull	No
Furniture and Fittings, Carnegie Library, West Park	Leeds Corporation	City Engineer's Office, Municipal Buildings, Leeds	No
Paving and Flagging Streets	do	W. Morton, Quantity Surveyor, 27, John-street, Sunderland	No
Chancel, etc., Parish Church, Heckmondwike	Fife Estates—Keith District	Office of Council, Exeter Castle	No
24 Miles of C.L. & Lead Water Pipes, etc., Cranrock	Devon County Council	Doolin, Butler, & Donnelly, Architects, Dawson-chambers, Dublin	No
Rebuilding Partridge Bridge, Newton Toney	Manchester Parks Committee	City Surveyor's Office, Town Hall, Manchester	No
Alterations to Old Chapel, Omagh, District, Asylum	Mr. Hammond	C. G. Baker, Architect, Town Hall-chambers, Great Yarmouth	No
Sheet Piling the Bank of River Irk, Lower Crumpsall	New Coastguard Buildings at St. Anne's Head	Civil Engineer, H.M. Dockyard, Pembroke Dock	No
Two Houses, Ablon-road, Great Yarmouth	2,000 Tons of Cast-Iron Pipes (Waterworks, Extension)	T. Cookson, Engineer, Town Hall, Preston	No
*New Coastguard Buildings at St. Anne's Head	Relaxing Feeder Mains	H. Richardson, City Electrical Engr., Dudhope-crescent-rd., Dundee	No
Vertical Steam Engine, Daryhulme Sewage Works	Cleaning and Repairing Chew Magna Parish Church	W. H. Talbot, Town Hall, Manchester	No
Cattle-house and Root-house, Kerling, Kea	Morrison to Pontardawe-road Widening	G. Gow, Tregothnan Office, Truro	No
Thirty-five Blocks of Stalls in New Covered Market	Two Shops and Houses, Trevelwart-st., Camborne	T. Mansel Franklin, Clerk, Westgate-street, Cardiff	No
Two Houses at Dunloe, Co. Donegal	Two Houses at Dunloe, Co. Donegal	T. C. Hope & Son, Architects, 23, Bank-street, Bradford	No
Promenade Tramway Materials	1,200 Cubic yds. of Broken Pitt Fillets	Breakfasts, etc., U.D.C.	No
Stores	Sewer and Road Works, Wormald-street	Ristrict Sanitary Committee	No
Retaining and Fence Walls	Reconstruction of 100 Privies, etc., in Watercloset	Liversedge U.D.C.	No
Alter, etc., Catholic Methodist Chapel, Ton-yr-efall	Wiring Instal. at Workshp., etc., Wormwood Scrubs	Bingley U.D.C.	No
Steam Engine and Pumps	Rolling Stock	Blackburn Health Committee	No
Carriage Fittings	Wheels and Axles	Hammersmith Guardians	No
760 yds. of 12-in. Pipe Sewer	900 yds. of 15-in. Pipe Sewer	Sheppey Guardians	No
Pumping Station and 500 yds. of C.I. Rising Main	Oas Engines, Pumps, etc.	South Indian Railway Co., Ltd.	No
Engines at Workhouse, Sheerness	Two Shops and Dwellings, High-street, Northey	East Barnet Valley U.D.C.	No
*Dwarf Wall and Iron Fencing, etc., at Phillip-lane	850 Tons of Granite Setts	Guardians of Sheppey Union	No
100 Tons of Cement	*Pulling Down Old Buildings, etc., Jernerton Infirm.	Tentless, Pontonrials Chapel	No
*Making-up Roadways in continua, of Occupier-road	Retorts and Firebricks and Fireclay	Tottenham U.D.C.	No
Alterations, etc., Dedham National Schools, Essex	Enlargement of Fourth-avenue School	Leigh Corporation	No
Sewers, Arrows, Upton, and Woodcut, Ashford, Mdx.	Sewers, Bidston, and Noctorum	Hackney Union	No
Sewers, Prenton	Four Attendants' Houses at Granish, Ireland	Southend-on-Sea Corporation	No
*New Coastguard Buildings at Freeston, Lincoln	*Tramway Works, etc.	Bradford Corporation	No
Alterations to Police Station, St. Albans	Alterations at Workhouse	The Managers	No
Iron Staircase at Male Tramway Works	800 Tons of Steel Girder Tramway Rails	East Ham Education Committee	No
*Sewerage Works	*Underground Sanitary Conventence, Plalstow	Wirral R.D.C.	No
*Lining 13 Water Pipes with Concrete, East Ashford, Mdx.	Baltic-street Intercepting Sewer	Londonerry District Lun. Asylum	No
Fish, etc., Market in Every-street, Nelson, Lancs.		Admiralty	No
		C. B. of Belfast	No
		Buzby R.D.C.	No
		Middle-brough R.D.C.	No
		Hertford C.C.	No
		Ware Guardians	No
		do	No
		Great Yarmouth Town Council	No
		C. B. of West Ham	No
		Gl. Southern & Western Rv., Ireland	No
		West Hartlepool Corporation	No
		do	No
		Market and Library Committee	No

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be delivered. Includes entries for Admiralty, The Governors, and various municipal councils.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Lists appointments for Corporation of London, Northern Nigeria, and London County Council.

Those marked with an asterisk (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments, xix.

TENDERS.—Continued from page 475.

For 2,400 yds. of 12-in. sewer at Gilly etc., Cheshire, for the Cheshire and Ghatley District Council. Mr. E. Sykes, Engineer, Offices, 9, High-street, Hazel-grove, near Stockport. £3,578 15 6

For street works, Oak-avenue, etc., at Hulme, for the Cheshire and Ghatley Urban District Council. Mr. E. Sykes, Engineer, Council Offices, Street, Cheshire. £3,208 3 0

For road-widening works at Cheshire, Cheshire and Ghatley Urban District Councils, Engineer, Council Offices, 9, High-street, Hazel-grove, near Stockport. £1,630 15 8

For making a new street off Moor Messrs. C. H. Marriott, Son, & Shaw, Dewsbury. £214

For improvement to Cotteshall-road, for the Town Council, Mr. J. H. Norris, Surveyor, Municipal Offices, Godalming. For Steelwork. Thompson, & Co., Birmingham. £80 10 0

For Public library, Windmill-street. Mr. J. Bennett, architect, 10, Gray's-inn-square, 101, Parrock-street, Gravesend. £5,316 11 0

For constructing a light railway along the Harlesden, and Harrow-road, for the Light Committee of the Middlesex County Council. F. Wakelam, County Engineer, Guildhall, Ser. S.W. £260,834 4 10

For erecting a bridge over the Beverley and Drain at Electric Light Works, Seaton-croft-lane, near Huddersfield. Mr. A. E. White, City Engineer, Huddersfield. £213 17 5

LIVERPOOL.—For erecting a new sorting office, Lark-lane, for the Commissioners of H. M. Works and Public Buildings:—

Table listing bids for Liverpool sorting office with names like Lewthwaite & Kewley, A. White & Sons, etc., and amounts.

LONDON.—For erecting a block of shops, with residential flats over, including roof-garden, at Vauxhall Bridge-road, S.W. Messrs. Falgrave & Co., architects, 28, Victoria-street, S.W. Quantities by Mr. J. Farrell, 28, Victoria-street:—

Table listing bids for London shops and flats with names like Wood & Co., Foster Bros., etc., and amounts.

LONDON.—For completion of six villas at Westbury-avenue, N., for Mr. W. H. Northcott. Messrs. Frith, Garland, & Co., surveyors, 70, Grand-parade, Harringway Park, N.:—

Table listing bids for London villas with names like White & Sons, A. R. Miller, etc., and amounts.

LONDON.—For the construction of a relief sewer from Corwall-street, to Upper Addison-gardens, Kensington, for the London County Council:—

Table listing bids for London relief sewer with names like S. Pearson & Son, Ltd., R. McAlpine & Sons, etc., and amounts.

LONDON.—For the construction at Plumstead of a portion of the new southern outfall sewer No. 2, and of a portion of the new high-level sewer No. 2, for the London County Council:—

Table listing bids for London sewer construction with names like J. Smith & Co., J. Watt, etc., and amounts.

[The Chief Engineer's estimate of the cost of the work was £91,727 7s. 2d.]

LONDON.—For alterations, repairs, and painting to Medical Superintendent's house at North-Western Fever Hospital, Lawn-road, Hampstead, N.W., for the Metropolitan Asylums Board. Mr. W. T. Hatell, Engineer-in-Chief:—

Table listing bids for London hospital work with names like S. Gorer & Son, W. D. Hodges & Co., etc., and amounts.

LONDON BOARD OF EDUCATION TENDERS.

Table listing bids for London Board of Education tenders with names like C. Dearing & Son, M. Pearson, etc., and amounts.

NUNEATON.—For Nuneaton Wesleyan Reform Church. Messrs. George Beines & R. Palmer Baines, architects, 5, Clements-lane, Strand, London, W.C.:—

Table listing bids for Nuneaton church with names like Coulaon & Co., A. Bellingham, etc., and amounts.

OSSETT.—Accepted for stable and mistal in Wesley-street, Ossett, for Mrs. Steele, of Kettering. Messrs. C. H. Marriott, Son, & Shaw, architects, Church-street-chambers, Dewsbury:—

J. & G. Hutchin-son	£189 12 7	W. H. Thomp-son	£64 0 0
F. W. Brooke ..	98 10 0	H. Watson ..	13 10 0
		Anty & Rylands	8 5 6

PONTNEWYDD.—For proposed houses at Tynnewydd Farm, Pontnewydd, Mon., for Messrs. The Park View Building Club. Messrs. Smeal & Harvard, architects and surveyors, Newport, Mon.:—

Jerrett & Fisher	£5,596 0 0	C. Shopland ..	£1,970 0 0
J. Jenkins ..	5,525 0 0	Poulton & Whiting ..	4,720 0 0
C. H. Reed ..	5,400 0 0	W. Clemens & Co.	4,600 0 0
W. A. Linton ..	5,280 0 0	J. Hooper ..	4,179 0 0
J. Charles ..	5,264 17 9	J. Dean & Son	3,127 11 0
J. Linton & Co., Ltd.	5,150 0 0		

RICHMOND.—For enlargement of head post office:—

J. W. Brooking	£4,997 0 0	.....	£29 0 0
A. H. Everitt	4,856 10 0	.....	30 0 0
A. E. Townsend	4,838 0 0	.....	20 0 0
Speechley & Smith	4,670 0 0	.....	10 0 0
Chambers Bros.	4,412 16 7	.....	57 16 7
General Builders, Ltd.	4,407 0 0	.....	50 0 0
Eldridge & Son	4,365 0 0	.....	20 0 0
T. Bendon	4,359 0 0	.....	52 0 0
Banyard & Son	4,335 0 0	.....	40 0 0
T. J. Messom & Sons	4,327 0 0	.....	50 0 0
J. Dorey & Co., Ltd.	4,320 0 0	.....	50 0 0
W. H. Lorden & Son	4,265 0 0	.....	—
S. N. Scoble & Son	4,163 0 0	.....	46 0 0
B. E. Nightingale	4,136 0 0	.....	30 0 0
R. Dean & Co.	4,040 0 0	.....	40 0 0

RIDDINGTON (Notts).—For the rebuilding of the White Horse Inn, for Messrs. The Home Brewery Co., Ltd. Mr. Fred C. Martin, architect, Angel-row, Nottingham:—

J. H. Vickers ..	£1,265 0 0	A. B. Clarke ..	£1,186 0 0
H. Parr	1,241 2 1	T. H. Harper ..	1,157 0 0
C. Woolf	1,231 0 0	E. Morris, Day- brook*	1,141 0 0
W. Manle & Co.	1,218 5 0		
F. Messom ..	1,200 0 0		

SALISBURY.—For alterations and additions to the laundry, and for building a lavatory and bathroom to children's block, for the Guardians. Messrs. J. Harding & Son, architects, 58, High-street, Salisbury:—

Webb & Co.	£487 0 0	W. Roles & Son	£398 0 0
Bailey & Marlow ..	465 10 0	C. Mitchell ..	—
E. Pearce & Sons ..	428 0 0	Downton ..	—
Wort & Way	412 14 1	Salisbury* ..	359 0 0
P. Trybura & Son	388 0 0		

STAFFORD.—For erecting new County Education Offices, Stafford:—

G. H. Marshall ..	£5,595	Tomkinson & Bettelley ..	£4,987
T. Godwin	5,389	R. Whittingham ..	4,936
T. Lowe & Sons ..	5,209	E. Espley & Sons ..	4,849
Ward & Gothehere ..	5,277		

TODMORDEN.—For sewerage works (Contract No. 1, tanks and bacteria beds; Contract No. 2, pumping station, etc.) for the Corporation. Mr. J. A. Heap, Borough Engineer, Town Hall, Todmorden:—

B. Sumb, Todmorden*	£19,861 4 7
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WINCANTON (Somersetshire).—For the construction of sewage disposal works, for the Rural District Council. Mr. A. P. I. Cotterell, engineer, 28, Baldwin-street, Bristol:—

F. Banfield ..	£3,693 10 2	Wright & Son	£3,000 0 0
Grounds & Newton ..	3,585 0 0	S. Wood	2,877 10 0
D. B. Drenthorn ..	3,296 14 0	J. & T. Binn, Son	2,705 12 6
Bird & Pippard	3,180 0 0	ham-road, K n o w l e ,	
Lloyd & Son ..	3,084 3 4	Bristol* ..	2,687 4 4
W. Coulin & Son	3,082 0 0		

WOOD GREEN.—For constructing a light railway along Station-road and Buckingham-road, for the Railway Committee of the Middlesex County Council. Mr. H. T. Wakelam, County Engineer, Guildhall, Westminster, S.W.:—

Railway No. 3. Order 1903. Station-road, Wood Green.	
Railroad & Tramway Cons. Co.	£24,496 9 5
Sir W. Pearson	21,965 17 5
Nowell & Co.	19,721 14 7
G. Law	19,275 0 0
W. Manders	18,572 0 0
Wilkinson Bros.	18,354 0 0
J. A. Ewart	18,339 12 7
Murdoch, Greig & Matthews	18,217 13 9
T. Adams	17,075 18 0
W. Griffiths & Co.	17,368 0 0
Dick Kerr & Co.	17,266 15 4
C. Ford, 1, Station-buildings, Willesden Junction, N.W.*	17,266 0 0

YIEWSLEY (Middlesex).—For the erection of a new school to accommodate 360 infants, for the Middlesex County Council. Mr. E. G. Cresshall, Surveyor of School Buildings, Guildhall, Westminster, S.W.:—

Minter	£4,212	Keasley	£3,782
Godson & Son ..	4,163	Heath	3,765
Patman & Fother-ingham	4,153	Dorey	3,625
Goddard & Son ..	4,099	Knight & Son ..	3,563
Blackburn	3,995	A. & B. Hanson* ..	3,531
Kingierie & Son ..	3,870		

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The Builder.

VOL. LXXXVII.—No. 3223.

NOVEMBER 12, 1904.

ILLUSTRATIONS.

Quistreham: view from West End }	From Photographs.
West Doorway, Quistreham }	
Public Offices, Hendon	Mr. T. H. Watson, F.R.I.B.A., Architect.
Designs for Textiles	By Mr. A. B. McDonald.

Illustrations in Text.

Arcading over West Doorway, Quistreham	Page 492	Public Offices, Hendon	Page 492
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Experimental Bacterial Treatment of London Sewage.



WE have at various times drawn attention to the Reports issued by the London County Council on the bacterial treatment of London sewage, and as these Reports are now being collected and published in a somewhat abridged form, we think it may be useful to summarise the results obtained during the long series of experiments from 1892 to the present time. The first experiments were commenced in May, 1892, under the direction of Mr. W. J. Dibdin, but since 1898 the work has been continued by Professor Frank Clowes, with whom Dr. A. C. Weston has been associated in the bacteriological investigations.

From May to August, 1892, experiments were made with different kinds of material for use in contact-beds, but as the experiments are now somewhat out of date, we need only say that Lowestoft pease of the size of peas yielded the best degree of purification; coke-ze, however, proved fairly efficient, as it is a cheap material, it was selected for the experiments on a larger scale.

In 1893 a large coke-bed (known as "the acre bed," although its actual area was 1,067 sq. yds.) was started, and has been in use ever since with but little modification; in 1898, however, its depth

was increased from 3 ft. to 6 ft. The first experiments on the bed 3 ft. deep were instituted for the purpose of ascertaining the rate at which the bed could deal with the effluent from the chemical precipitation-tanks. The rate rapidly fell from nearly a million gallons daily to one-fourth of this quantity; after the sixth week the effluent was putrid, and at the end of twelve weeks the bed was "quite useless, being putrid throughout." After a rest of three and a half months, which sufficed to bring it again into working condition, the bed was tested in a more reasonable manner, and succeeded in effecting a purification of 70 to 80 per cent. on 500,000 gallons of tank effluent per day. Towards the end of 1894, the periods of rest on the six working days were shortened, and work was suspended from 10 p.m. on Saturdays to 6 a.m. on Mondays. The bed was filled as rapidly as possible, allowed to stand full for one hour, and then quickly emptied. During a period of eight weeks the bed treated 1 $\frac{1}{8}$ million gallons on each working day, and effected an average purification of 78 per cent.

In 1897 experiments were made with sewage "which had undergone previous settlement without the aid of chemicals," and a purification of 81.5 per cent. was obtained. The coke used in this bed was not sifted, and after the depth had been increased to 6 ft., it was discovered that the lower or original portion had become very much consolidated. The deduction is that unsifted coke is quite unsuitable: All the fine particles ought to be removed by screening, and in addition to the

screening it is, we may add, a good plan to wash the selected particles thoroughly, so that all the fine dust adhering to them is eliminated.

The next series of experiments was on a smaller scale, and was somewhat unsatisfactory. Crude sewage was passed successively through an upper primary and a lower secondary bed, each of which was 6 ft. deep. Two pairs of beds were constructed, one pair being filled with Kentish ragstone and the other with coke. In each pair the material in the upper bed was passed by a 4-in. mesh and rejected by a $\frac{1}{2}$ -in. mesh, and that in the lower bed was passed by a $\frac{1}{2}$ -in. mesh and rejected by a $\frac{1}{16}$ -in. mesh. The ragstone did not give as good results as the coke, and in both cases the degree of purification was unsatisfactory—49 per cent. for the ragstone and 63 per cent. for the coke. In another series of experiments on similar lines the depth of the beds was increased to about 9 ft. 9 in., but in one pair the primary and secondary beds were filled with coarse material, and in the other pair the primary bed was coarse and the secondary fine. Coke was used throughout—that in the three coarse beds having passed a 2-in. and been retained by a $\frac{1}{2}$ -in. mesh, and that in the fine bed having passed a $\frac{1}{2}$ -in. and been retained by a $\frac{1}{16}$ -in. mesh. The pair with the coarse and fine beds gave much better results than the other pair (76 per cent. purification against 63), but all the beds were gradually being choked by the solid matters in the sewage, and in November, 1900, a new series of experiments was started. The

same tanks were used again, but the coke was removed from the upper tanks, and the crude sewage was allowed to settle in these before being passed on to the lower beds, which were as described above, but with the depth of the coke reduced to 6 ft. The settlement of the sewage was beneficial, but was not carried out in such a manner as to allow much septic action to take place, and the purification effected by the tank and coarse bed was only 51 per cent., and by the tank and fine bed 60 per cent.

All the experiments recorded above were carried out at the Northern Outfall Works, but in 1898 experimental work on somewhat similar lines was begun at the Southern Outfall Works, Crossness. Three tanks, each of which had an area of about 27 sq. yds., were used. In the first series, one of the tanks was filled to a depth of 1 ft. with coke of uniform size (each piece about as large as a walnut), and effected an average purification of 52.2 per cent. when fed with crude sewage twice daily, the tank standing full for three hours. The other tanks were filled to a depth of 6 ft. with similar coke, and were arranged as primary and secondary beds, the crude sewage being treated by contact in the primary bed, and the effluent from this being similarly treated in the secondary bed. The percentage purification effected by the double contact was 68.4. Better results would probably have been obtained if finer coke had been used in the secondary bed. Incidentally this series showed that contact beds must be treated with small doses of sewage until they have matured sufficiently to allow the normal quantity to be applied; otherwise the beds and effluent will become putrid, and the capacity of the beds will be seriously reduced by accumulations of sludge.

In 1899 the depth of one of the beds was increased to 13 ft., and was filled with crude unsettled sewage—once a day from February 27 to March 25, and generally twice a day from March 27 to October 9, except Sundays. The capacity rapidly diminished from 41 per cent. of the capacity of the empty tank on March 9, to 34 per cent. on June 8, and 28 per cent. on October 10, and the purification fell from an average of 53.3 per cent. for the first period to an average of 47.2 for the second. These unsatisfactory results led to a series of experiments, in which the sewage was "very roughly" settled in a wooden tank before being passed into the bed. From October 13 to December 22, 1899, the bed was filled twice a day, and from January 12 (when the capacity was only 31 per cent. of the capacity of the empty tank) to April 5, 1900, three times a day. The purification was 57.8 per cent. for the first period, and 52.2 for the second. The rough settlement of the sewage allowed the bed to treat a larger quantity than when the sewage was applied without sedimentation, and the degree of purification was also higher. A third series, in which the sedimentation was more thorough, did not produce a better effluent, but this was partly due to the fact that the bed was filled four times a day (except Saturdays and Sundays). The process of sedimentation was carried out in a tank, the passage of the sewage

through the tank occupying about five hours. The purification was 55.7 per cent. The air in the empty bed was tested, and the results showed that, "even in the case of the deep 13-ft. bed, the air at the lower part of the bed was not seriously deficient in oxygen."

Another interesting experiment with rapidly-sedimented sewage was also made. The whole of the sewage arriving at the Southern Outfall, during a period of three weeks (December 24, 1899, to January 13, 1900), was passed into settling channels 581 ft. long, along which the sewage flowed at an average rate of 7.4 ft. per minute; a portion of the sewage thus rapidly sedimented was then treated in a small coke-bed contained in a tank which had a capacity of 280 gallons. The bed was filled three times a day, and the liquid capacity did not diminish during the progress of the tests. The average purification effected by the whole process was 58.7 per cent.

All the experiments described above were carried out with contact-beds, but from November 7, 1899, to May 26, 1900, one of the old coke-beds, 4 ft. deep, was used as a continuous filter for the treatment of settled sewage. "Various methods of continuously feeding the bed" were adopted, but no details are given. The results were not satisfactory, and the quantity treated was not as great as by the intermittent system.

The last series of experiments at Crossness was begun on November 1, 1900, and differed from the others principally in the length of time allowed for the settlement of the sewage. One of the three brick tanks was used as a septic tank, through which the crude sewage was passed, each portion being about six hours in the tank. A certain amount of septic action took place, and the effluent was then treated in one of two contact-beds 6 ft. deep. The capacity of one of the beds was measured at intervals, and decreased gradually from 32.2 per cent. of the capacity of the empty bed on October 8, 1900, to 23.3 per cent. on January 21, 1901, the bed during this period having received four fillings a day (except on Sundays); on March 7, after a rest of seven weeks, the capacity had increased to 28.9 per cent., but on October 5, after receiving an average of two and a half fillings a day, it had decreased again to 24.2 per cent. The average purification was only about 54 per cent.

Among the conclusions based on the various experiments, the following may be mentioned:—That by suitable sedimentation raw sewage is deprived of matter which would choke the coke-beds, and the sludge which is deposited is reduced in amount by bacterial action to a very considerable extent; that the capacity of a coke-bed fed with settled sewage "fluctuates slightly, but undergoes no permanent reduction"; that the bacterial effluent from coke-beds fed with settled sewage "does not undergo offensive putrefaction at all, even in summer weather"; and that the use of chemicals is "quite unnecessary under any circumstances" when bacterial treatment is adopted. We have our doubts whether these conclusions can legitimately be drawn from the experiments at Barking and Crossness; experiments elsewhere

appear to us to have had some influence on the judgment of Professor Clowes.

We cannot pause to consider section of the Report which deals with the methods employed in making chemical examinations of the sewage effluents, and must only briefly indicate the suggested method of dealing with London sewage—namely, *first*, a preliminary screening to get rid of coarser matters only; *second*, settlement in detritus-chambers in which suspended mineral matter would be deposited; *third*, incipient septic treatment in tanks or channels for about six hours; *fourth*, aeration of the septic effluent, which "may be effected by allowing the liquid to fall through a perforated tray, so as to break it up into separate streams"; *fifth*, bacterial treatment in contact-beds.

Division II. of the Report is by Dr. Houston, and deals with the bacteriological part of the question, as distinguished from the chemical, which was discussed by Professor Clowes in Division I. I cannot review Dr. Houston's elaborate report in detail, but may repeat a statement that (in view of the results obtained from his tests) "until reliable evidence to the contrary is forthcoming the effluents from the bacteria beds should be regarded as hardly, if at all, safer in their possible relation to disease than the raw sewage before treatment." The italics are Dr. Houston's, but well to draw attention to a new note, in which he says that in his report he has confined his remarks "to results obtained with contact-beds at Barking and Crossness, and [has] not trusted these results, not with the bacterial processes, but with the results obtained from the existing chemical treatment at the Outfall Works." An effluent after chemical treatment "seemingly worse bacteriologically than the effluent from the bacteria beds, much more impure chemically, the inference is that the bacteria bed treatment is to be preferred." Dr. Houston therefore agrees with Professor Clowes in recommending the gradual adoption of the bacterial system for the purification of London sewage.

The third division of the volume contains tabulated information as to the bacterial treatment of sewage, either experimentally or otherwise, at different provincial centres, and eight short papers on the number of bacteria present in sewage and effluents, and on other related subjects, are given in an appendix.

The volume as a whole is interesting, but will not be as generally useful as reports issued by some of the provincial towns, such as Manchester. The London experiments were carried out solely for the purpose of ascertaining whether bacterial treatment would purify the sewage to a degree sufficient to prevent nuisance or danger arising from the discharge of the effluent into the estuary of the Thames. No systematic attempt was made to obtain the degree of purification required in the case of inland towns. Some of the experimental tanks and beds were makeshift character. Whether this is due to parsimony on the part of the Council or to the lack of an engineer's advice we do not know, but in any case it renders the experimen-

value. The tests of continuous sitters appear to have been entirely inadequate, and the results differ so much from those obtained in other towns that we are inclined to think that the methods adopted for feeding the beds were ineffective. It is certainly strange that this series of tests was concluded in May, 1900, and that no attempt has been made to test any of the apparatus designed during the last four years. We are not by any means convinced that the experiments as a whole are worthy of the importance and magnitude of the problem to be solved. No great harm will be done if bacterial treatment on the lines suggested in the Report is adopted tentatively for some portion of the cage, but, at the same time, the experiments ought to be continued, and an engineer may, with advantage, be appointed to work in conjunction with the chemist and bacteriologist.

THE NEW GALLERY.

THE New Gallery is at present occupied by the fourteenth exhibition of the Society of Portrait Painters. We have never been able to understand exactly what is the special object of this Society, unless to find opportunities for the exhibition of portraits which may not easily find room in general exhibitions. It does not specially represent the highest achievement in portrait painting, and certainly does not represent any guiding principle in the art; in fact (and this is perhaps one of its sources of interest) it merely serves to show how exceedingly various are the methods which may be employed and the aims which may be striven for in portrait painting, from the trait which is simply and obviously "likeness," to that which is just as obviously (in the artist's mind) an occasion for a study in colour or in the details of costume. Portraiture is capable, no doubt, of being regarded from all these points of view; the highest is that in which the portrait gives more than the outward semblance—gives a suggestion of the mind and character of the sitter, combined with a pictorial effect; but such portraits are among the rare productions of the greatest painters.

The special feature of the exhibition consists in some examples of the works of the late Herr Leubach. These certainly come under the head of portraits which are of intellectual interest as expressions of character; and they have moreover most distinct and remarkable qualities of style and execution, especially in the painting of the faces, in which modelling and expression seem to be produced by a kind of suggestion of brush rather than by any attempt at realistic execution. The most remarkable of them in this respect is the portrait of Moltke, in which the head is a masterpiece of characterisation. From the two portraits of Bismarck, one of them (that of Bismarck *en retraite*, his hands leaning on the top of his stick) well known through engravings, one may judge that Leubach, like some other great portrait-painters, was a shrewd critic of his sitters, and chose to convey his own impression of their character; perhaps to

a greater extent than the sitters sometimes realised, or would have approved if they had. In the two portraits of Bismarck be certainly, so to speak, sits in judgment on the great Chancellor; and it would not be difficult to conclude, from the evidence of the paintings, that he had more admiration for Moltke than for Bismarck. On the other hand, his feeling for colour is not unexceptionable. "Miss Peck and her Cat" (28) is a most remarkable picture in its way, the cat especially being a *tour de force* of brilliant execution (reminiscent of one of Millais' rabbit in a well-known girl's portrait); but the colour is yellow and unpleasing.

It is interesting to compare with Leubach's the portraits of another foreign artist, M. Gabriel Nicolet. No contrast could be greater. The Frenchman's portraits have not the intellectual force and interest of Leubach's; but they are examples of a style which is highly finished and consistent in every part, yet totally without hardness or mere prosaic realism. They are not the class of what we call "costume portraits" (of which there are examples in the gallery), in which the painting of the dress and accessories is the main interest, and apparently the main effort of the painter, and the face is of quite secondary value. M. Nicolet finishes every detail, but it is detail subordinated to the total effect, and every part treated in relation to that, and the greatest care is expended over the features and hands. These are not, it is true, what can be called powerful portraits; one cannot get rid of the impression of a certain "prettiness" of effect in them; but they are very consistent and highly finished works of art; none more so in the gallery.

The Society seem to have been obliged to depend somewhat on loans of old pictures; Burne-Jones' portrait of a little boy, "Philip Comyns Carr" (6) is an old friend, as well as some others. Among the most interesting of the new pictures—or what we take to be such—are Mr. W. Strang's "Portrait Study" (21)—apparently the head of Mr. Chamberlain, though not so stated—and Mr. Austen Brown's "A Musician" (34), really a study in colour, and a very interesting one, but the interest is certainly not in the head, which is a weak one and weakly treated. Mr. Richard Jack's "Woman in White" (33) belongs to the same class of studies of effect, in this case not of colour but of pose and composition of lines; a woman seated and nearly turned away from the spectator; a fine piece of drawing. Mr. Melton Fisher's portrait (38) of a young girl in a wide-brimmed hat seated in front of what may be called a Gainsborough landscape (indeed the whole picture is a kind of reminiscence of Gainsborough) is very graceful as a whole, but the face rather flat and deficient in modelling. Mr. Ellis Roberts's large full-length portraits of ladies are obviously and intentionally revivals of the old school of rather theatrical pose in the portraits of ladies, and for the present day have an air of unreality and affectation. Among others to be named are Mr. Collier's of Sir Charles Strickland (54), Mr. Kennington's "Miss Marjorie Close-Brooks" (72),

showing a charming head and admirable drawing of arms and hands; and a curious specimen of a full-length portrait by Corot (114): a very early work (we should imagine), a French lady in an astounding dress of the period. Perhaps Corot is the very last name that would occur to anyone on looking at it.

In the Central Hall is a collection of sculpture—not portrait sculpture except in a few instances—among which we are glad to see again Mr. A. G. Walker's beautiful group "Sleep," a nude woman and her infant, this time not with a sofa in front of it, as it was placed when exhibited (or concealed) at the Royal Academy. Mr. Derwent Wood exhibits a life-size bronze of "Dante at Ravenna," seated, with a symbolical group of Paolo and Francesca at his feet, and a line life-size figure of "Diana," described as a garden statue (plaster brouzed); a nude Diana, however, is not in accordance with the traditional presentation of the goddess of the chase, though we remember that Falguière has given a modern precedent for it. There are other interesting works, large and small, among the sculpture collection.

NOTES.

THREE important points are brought out in the report by Mr. Jackson, R.A., upon the condition of Bath Abbey Church. It will be remembered that during the early part of August last the central tower was attacked by lightning, and that Mr. Jackson was commissioned to inquire into the extent of the damage done. Fortunately this was far less than might have been expected, being limited to the upper portion of the south-east pinnacle. Referring to this portion of his inquiry, Mr. Jackson calls attention to the fact that the building is entirely without lightning protectors, and should be provided with a complete system of points and copper tapes in accordance with a scheme now submitted by him. We are really astonished to learn that the authorities have been contented to go on for so many years without taking precautions against lightning that are regarded as absolutely essential by all sensible men. The removal of the shattered masonry, however, revealed a serious structural defect, for it was found that the four pinnacles of the tower had been bonded with iron clamps, which, being exposed to climatic influences, had oxidised so seriously that in some places the clamps had expanded to double the original thickness, thereby causing a corresponding displacement of the masonry. Further examination of the building showed that the north-east pinnacle of the choir was in a particularly dangerous condition, the final having been broken across, and the two top courses displaced to the extent of 1½ in. on one side. This investigation serves to demonstrate once more the unsuitability of iron as a material for binding together stone-work, especially in exposed positions. All the pinnacles of the tower, and of the choir, will now have to be taken down and rebuilt with slate dowels and copper rods in place of the iron clamps and ties. A second structural defect discovered by Mr.

Jackson relates to the flying buttresses which, originally having no work to perform, were utilised by Sir Gilbert Scott for resisting the thrust of the nave vaulting added some thirty years ago during the restoration of the church. These buttresses are now being overpowered by the vaulting, and the walls are taking a perceptible outward inclination. Mr. Jackson considers it necessary that the walls should be shored at several points, and that the buttresses should be rebuilt in such manner as to afford adequate resistance. This is evidently a matter of extreme urgency, as the buttresses have been pushed out to a distance of some inches and are in imminent danger of failure. We cannot help feeling that the recent lightning stroke has turned out to be a most fortunate occurrence, for it has had the effect of directing prominent attention to three serious defects which, as decided as a public meeting held in Bath last Friday, are to be remedied without delay.

The Condition of Elementary School Buildings. THE Education Committee of the Anglesea County Council has addressed a strong circular to the managers of the "non-provided," or voluntary, schools in regard to the state of the school buildings, calling upon them to carry out all "the various alterations, improvements, and repairs" set out in the report of the County Surveyor. The County Council is doing good work in this matter, for every "voluntary" school building should be in a proper state before it becomes chargeable on the county rates. We have no concern with the general aspect of the Welsh education strife, but, as regards school buildings, the County Councils appear to be acting in a strictly legal manner, and the managers of the voluntary schools seem, on the other hand, to be shirking their legal obligations. We are inclined to think that there are a good many English County Councils who are letting the managers of voluntary schools escape their obligations. Bad buildings and insufficient ventilation are hindrances to proper education and conduce to illness and epidemics, and there can be no question that the County Councils should take care that all school buildings are up to a proper standard of construction and sanitation.

Manchester Water Supply. OWING to the extreme dryness of the summer and autumn of the present year, considerable anxiety has been experienced by the Manchester Water Committee, who have found it necessary to restrict supplies for several weeks past throughout the city boundaries. Very little water is left in the Longden Dale reservoirs of the old waterworks which are still used to supplement the Thirlmere supply. When we saw these reservoirs two or three months ago the water level was very low, and it has since fallen so much that the total storage is barely sufficient to supply the inhabitants of Manchester for eighteen days. Under these circumstances much satisfaction must be felt in that city that the second pipe line from Thirlmere is at last completed and in operation. The conduit in question was designed to carry an additional supply of from ten to twelve million

gallons daily. Its completion at the present time is most opportune, and it is clear that the Corporation were well advised in commencing its construction at a sufficiently early date.

Defacement of the Victoria Falls. ONLY a few years back the Victoria Falls were scarcely known, even by name, to the bulk of the English people. To-day almost everyone has heard or read of them, and since the opening of the railway in June last they have been visited by tourists and travellers from various parts of Africa, Europe, and America. We need not call to our aid the characteristic phraseology of the guide-hook for the purpose of reminding our readers of the magnificent scenery to be found at this part of the Zambesi River. Suffice it to say that the vicinity of the falls affords a series of pictures, each with its peculiar charm, probably unrivalled in beauty by any others in the world. The advance of civilisation into such a scene need not be regretted if the enterprising builders of railways, power stations, hotels, and other structures can be persuaded to keep the evidences of their activity somewhat in the background. The first intrusion was the steel bridge, now well on its way towards completion. In itself this structure may constitute no actual disfigurement, even though it will serve to suggest the presence of man in a place where Nature requires no artificial adornment. But the accompaniments of the bridge must be particularly objectionable, comprising as they will ugly embankments of red earth, signal-posts, and numerous unsightly accessories. Already a large hotel of timber and galvauised iron has been built close to the falls, and another of greater dimensions is threatened. What may happen when the utilisation of the falls for power is commenced we do not venture to predict, but unless a strong protest is made by the public against the further disfigurement of a place that will in due course become one of great resort by lovers of Nature, it is highly probable that the Victoria Falls will suffer severely under the ruthless hands of purely commercial pioneers.

Stability of Retaining Walls. IN a paper read before the Association of Yorkshire Students of the Institution of Civil Engineers, and now issued in pamphlet form, Professor Charnock considers the stability of retaining walls in relation to the overturning action of earth pressure. Various formidable mathematical processes have been devised for dealing with this point, but there are only two fundamental theories, both of them defective as generally enunciated. After pointing out the limitations of these two theories, due to Coulomb and Rankine, respectively, the author refers to a very simple construction published by Reblanu, of Vienna, for determining the position of the plane of rupture for any given inclination of the back of the wall, and for any slope of the upper surface of the earth supported. He discusses also an extension of this method, by Professor Haseler, of Brunswick, which has been largely adopted on the Continent with satisfactory results. Some further

modifications are suggested by Prof. Charnock, who gives full details of proposed method of procedure in pamphlet. Among modern research on the direction and magnitude of earth pressure, one of the most important mentioned by the author is the series of experiments conducted by Prof. Douath in 1891. These experiments, which were conducted with great care and accuracy, serve to show that Rankine's theory is not applicable to the case of a vertical wall with the upper surface of the ground horizontal, and that the magnitude of the earth pressure calculated by Rankine's formula, is at least 30 per cent. in excess of the actual pressure, whereas Coulomb's theory, due recognition be made of friction between the earth and the back of the wall, gives a value only about 6 per cent. in excess of the correct value. A calculation example in this paper shows that the method advocated by the author gives a result very nearly coincident with that afforded by actual experiment, and suggests its usefulness as a check on the empirical methods now generally adopted in practice.

Street Lighting in Manchester. MR. S. L. PEARCE, electrical engineer to the Manchester Corporation, presented a Report to the Electric Light Committee, which is of more than ordinary interest. The old arc lamps in Manchester have recently been replaced by new ones, and this has not only improved the street lighting, but has effected a considerable reduction in the cost of electricity consumed. The new lamps burn 120 hours without requiring new carbons, and it is stated that they give a uniform and steady light. A very extensive series of tests was made with a portable street photometer at a height of 4 ft. from the ground. The results are given in candle-feet, a candle-foot being the illumination produced by a standard candle at a distance of 1 ft. The illumination produced in ordinary street lighting varies from 0.03 to 1.5 candle-feet. An illumination of 1 candle-foot is considered to be of very good quality, and of 1.5 candle-feet very good. A maximum candle-power of a "standard" arc lamp was found to be 1,150, and of three burners in a lamp using intensified gas 525. It was found that the mean illuminating effect produced by the arc lamps was 2.03 candle-feet, as against a mean effect of 1.5 candle-feet produced by the intensified gas burners. The minimum illumination produced by the arc lamps was 1.08 candle-feet against 0.76 for the intensified gas burners. Interesting curves are given in the Report showing how the illumination varies at different distances from the lamps. The cost of 1,000 candle-power for 100 hours is given as 18s. when intensified gas is used, and 12s. 6d. when electric arc is employed. The distribution in each case is taken as 10 per cent. and the prices are the actual ones of the Corporation. Both the gas and electricity are very cheap, the cost of the latter being taken as 0.95d. per unit. It seems to us that Mr. Pearce's figures give a very fair comparison between the relative costs of the two systems of street-lighting in Manchester. It should be remembered, however, that too

ence must not be placed on photometric measurements even when only comparative comparisons are given, as the intensity of the light emitted is so different in the two cases. The distribution of light is better in the case of the electric arc. The Report would have been more interesting if it discussed the relative merits of arc lamps and Nernst lamps, as, in our opinion, the latter are very suitable for outdoor lighting.

ACCORDING to an estimate made by Mr. J. Arthur Reeve, a sum of 6,000*l.* is required for a reparation of the parish church. The buttresses of the tower, north clearestory wall, and the roofs need speedy attention. A restoration of the fabric was begun by Street in 1850. The Hoo chapel on the east side of the south transept was renovated in 1851. The east wall was decorated with a mosaic, and a reredos in mosaic by Street, representing the Last Supper, was set up. St. Mary's, one of the best of our country parish churches, built for the most part during the thirteenth and XIVth centuries, is cruciform in plan; and the massive and lofty western tower is constructed of flint and other materials laid chequer-wise; it has hexagonal buttresses, with doubled buttresses rising in stages and enriched in their upper parts with canopied niches. John de Beaufort, Abbot of St. Albans, was the patron of the church in the thirteenth century. The chancel *temp.* Edward IV.; the west tower and the south transept are of the reign of Henry VI., and contains the altar tomb of William de Wenlock, Bishop of St. Paul's and rector of St. Andrew's, Holborn, 1392. There are many interesting brasses of the period of the sixteenth century; the font stands within a double stone canopy or baptistery, decorated with the figure of the Virgin Mary. The canopy, of Anne Boleyn. The canopy is hexagonal on plan, has on each side an open arch surmounted with a crocketed gable filled with tracery and ending in a finial. Between the arches are slender buttresses merging into pinnacles; the ground is embellished with allegorical figures. The canopy, formerly gilded, is 20 ft. high, and has an internal diameter of 9½ ft. Whilst many of that kind are not infrequently seen in this country are the one at Trunch, in Norfolk, and the one at Trunch, containing the font, on the north side of the choir of Canterbury Cathedral, and there is some doubt whether the latter was originally intended for the purpose. The church measures 100 ft. by 57 ft., the transepts extending 20 ft., and contains 2,500 sittings.

NEXT week will be offered for sale, at the Mart, some relics of the church, containing the carved oak reredos or altar-screen 21 ft. by 12 ft., attributed to Gibbons, some oak-panelling, and carved fittings. The church was founded in the winter of 1883-4, and down of the benefice with the benefice of St. Vedast, Foster-

lane, and St. Michael-le-Queene. It was built in 1685 at a cost of 2,301*l.* 8s. 2d., after a simple design commonly ascribed to Sir Christopher Wren. The tower, of brick, rose in three stages to a height of 74 ft.; the body of the church, measuring 60 ft. by 33 ft., had a plain flat ceiling slightly coved at the sides. The east end, of stone, presented a row of six circular-headed windows, resting upon a lofty stylobate, and surmounted with a bold cornice and a balustrade. With the proceeds of the sale of the site and materials was built the church of St. Thomas, Finsbury-park, after Ewan Christian's designs; the carved oak pulpit, also the reputed work of Gibbons, was removed to St. Peter's, Fulham. The Myddelton family lived in the parish for a century or longer; amongst the many entries relating to them in the registers is one of a burial—"1631 December 10, Sir Hugh Middleton, Knight." Sir Hugh, who was made a baronet in 1622, was interred there in accordance with a direction in his will; he was knighted on the opening of the New River at Islington in 1613.

THE tenth annual exhibition of pictures of the English school, at Messrs. Agnew's Exhibition gallery, does not include any works so remarkable as those we have seen at some previous exhibitions there, but there are of course some very good pictures. There is Hoppner's portrait group of the Countess of Darley and her daughter, in a kind of theatrical cottager's make-up, but a very fine picture both in design and colour; Raeburn's Miss Ross of Balnagown, in the "grand" pose which was affected in aristocratic portraiture of the time, effective in its way, though it would be laughed at now; Gainsborough's fine half-length portrait of Miss Walpole, and "A Mountainous Landscape" by the same artist, in the old school of classical landscape, which, like the posed portraits, is rather *passé* now; and a portrait of Lady Milnes by Romney which is more powerful and full in colour than Romney's usual style, and in fact recalls Rubens. A "Wooded Landscape" by Crome is interesting not so much in itself as in the fact that it shows us an unusual side of Crome. Among the most interesting things in the gallery are Morland's two well-known little pictures, "The Farmer's Visit" and "The Visit Returned," which seem to bring us into the atmosphere of "The Vicar of Wakefield."

The Leicester Galleries.

At the Leicester galleries is a small collection of paintings by Mr. Lavery, the *raison d'être* of which is the exhibition here of his very charming portrait of a young lady carrying a great bunch of hawthorn blossom, formerly exhibited at the new gallery under the title "Spring," and now, we are glad to hear, to be placed in the Luxembourg. One can readily understand that it is a picture that would greatly recommend itself to contemporary French taste in art—which is saying much, but not everything. The rest of the works exhibited are small sketches and studies in oil, many of them very interesting, especially

two or three of "Ranelagh," and two or three heads all entitled "Mary," but under different numbers.

A New Knight.

We congratulate the Government on having at last done themselves the credit of

giving some recognition to an architect who has occupied for some time what may be called an exceptional position among contemporary architects, in conferring a knighthood on Mr. Webb, who is henceforth Sir Aston Webb. The honour is somewhat tardy, but it is an indication that the Government are at last awaking to the fact that there are architects who are worth honours, as well as politicians and Government officials.

MAGAZINES AND REVIEWS.

THE *Art Journal* commences with an article on Amersham by Mr. W. Monk (who has lately gone to live there), illustrated by many sketches which are equally interesting for their subjects and their admirable execution. The last one, "An Amersham Well," shows a most picturesque old timbered interior. Amersham street, with its quaint old market-house (of which there are separate sketches), fills the page over the heading of the article. A short article on Blake comments on the fact of the simultaneous exhibition in London of Lawrence's pictures at Burlington House, and Blake's at the small Curfax Gallery. What a contrast between the painter of Society and the painter of visions and ideals! Lawrence had the large and popular galleries of the Academy, yet what is his value to the world compared with Blake's? Albeit that there is—we cannot deny it—a strain of lunacy running through most if not all of Blake's work, yet is his lunacy a better and a higher thing than the drawing-room sanity of Lawrence. Etapes and its neighbourhood is the subject of an article and some good sketches by M. Gwit-Jolley. The Christmas Art Annual issued by the *Art Journal* publishers is devoted to the works of Mr. Boughton, a painter of many pleasant if not very strong pictures. Among the illustrations given here of his work are some which are in a more powerful vein—"A Village Below the Sandhills" for instance. During the last few years Mr. Boughton has taken to a class of subjects more idealised and imaginative than he painted in his earlier days; of these, "The Dark Waters of Forgetfulness" has a great charm. "The Tanagra Dance" is given in a colour print, in which form it comes out well enough, though the colour impression is rather at variance with our recollection of the original picture.

The *Nineteenth Century* contains a very interesting article on "Motor Traffic and the Public Roads," by Sir Walter Gilbey. A considerable portion of the article consists in a summary of the history of English roads in their different stages, from the time when the pebbly bed of a stream was selected by horsemen as affording the firmest ground, and when the main road at best was but a bridle-track, to the roads of Macadam and Telford, whose system of structure has, however, only been applied in the country to main roads, a number of country roads still remaining which have no "bed," and are unfit to bear heavy traffic. Sir Walter is adverse to the motor on ordinary roads, and points out that many country roads at this day are so narrow that ordinary vehicles have to pass each other at a walk for safety, and that the fast motor on such roads, with the increased width of build which is threatened, would practically close them to all but pedestrians; and, we may add, how are the motors of increased width even to pass each other? The relaying and widening of many roads will be a necessary preliminary to the extension of the use of motors. In regard to the question of speed, the writer observes that the argument of motor-builders seems to have been that as they can build motor-cars that will run at sixty miles an hour, therefore twenty miles an hour is a very moderate speed; whereas the question of maximum speed is one which should be decided, not on the capacity of motors for fast travel, but on the character of our high roads, and the use made of them by the public. He points

out, too, the important difference between fast motor racing on the splendid French high roads, "sixty feet in width, and running straight as a railway for miles," and the narrow English roads, "seldom running straight for a furlong" (that is a little exaggerated), and often having high banks or hedges, which prevent a sight of what is coming round a curve. The article is an eminently logical and sensible one, and very interesting reading as well.

The same issue includes an article on the "Exhibition of Early Art at Siena," by Mr. Langton Douglas, who has made the art of Siena a special study. The article is mainly concerned with the study and criticism of special works shown at the Siena exhibition. Mr. Douglas concludes by expressing a hope that this exhibition may lead to the formation at Siena of a permanent art museum illustrating the history of the sculpture of Siena and her triumphs in the minor arts.

In the *Fortnightly Review* Mr. W. M. J. Williams gives a summary, larding with figures, of the conditions of "The Transfer of the London Water Companies." We have neither time nor space to follow the writer through his figures. He is no doubt right in saying that the Metropolitan Water Board has a formidable task before it—more formidable than is perhaps at present realised; but we think he underrates the quality of the present supply. On the whole, London is supplied with wonderfully good water, considering the nature of its principal sources. It is quantity rather than quality that is deficient; and there is little doubt that, if the increasing requirements of the London public are to be supplied, the new Water Board will have to look for additional sources of supply beyond those at present available. We may add, as another reason, that it is highly desirable that the limit of the amount allowed to be abstracted from the Thames should be curtailed. To the same issue Mr. H. M. Paull contributes a short article on "The National Art Collections Fund," which has been formed to provide if possible, means for securing for this country works of art which otherwise, through the indifference and parsimony of our Government in such matters, would be lost to the country, as many desirable works have already been lost. We entirely agree with Mr. Paull that our National Gallery is "ludicrously deficient in pictures of the French School"; in fact, it would seem that the very existence of a French School has been all but ignored in the make-up of the collection. The roll of membership of the Fund has now reached nearly 500 names, including, we are informed, "the Directors of all the Museums and Public Galleries, many art-critics and experts, persons interested in every branch of art, and representatives of all ranks and professions." It is to be hoped that the efforts of the Fund may be successful in securing the purchase of works which might otherwise be sent out of England, as has been already the case in so many instances.

Harper includes a short article by M. Flammarion on the much-veiled and (we think) insoluble question—"Are the Planets Inhabited?" He sums up in favour of this conclusion, but on no scientific reasoning; the article, in spite of its coming from such an eminent astronomer, is one more of the fanciful reflections on the subject that are so common; the argument really only amounting to this—it would be so delightful and interesting to think that other planets are inhabited; therefore let us think so. An eminent novelist, Mr. W. D. Howells, in the same issue writes an article on the attractions of Folkestone—"In Folkestone out of Season"; attractions which we had not, we confess, been conscious of, but one never knows what scenes, in this country, will call forth the admiration of an American visitor. But as a matter of literary style it is a charming article.

An article by Dr. H. Smith Williams, on "Some Greek anticipations of modern Science," deals with an interesting and rather new subject, and shows how far some of the Greek thinkers and observers of two or three centuries B.C. were in advance of mediæval perceptors on the subject of the universe.

In *Scribner* Mr. Eaton's paper on the Royal Academy is concluded, and is a very interesting one, from its illustrations as well as its matter. One or two examples of letters received by the Secretary are delightful. Under the "Field of Art" Mr. Ransell Sturgis writes a paper on "Grass and Trees in Towns," in the course of which he objects to the present schemes in regard to Washington Park and the surroundings

as too formal and grandiose, and wishes for a less formal park, "laid out for the comfort and delight of the inhabitants of Washington." This is, apparently, one of the first notes of a reaction against the formal garden. As respects the Washington scheme, at all events, we cannot agree with it; the capital of a great country demands a stately treatment in its surroundings.

Longman's Magazine contains an article by Dr. Farquharson on "The House of Commons from the Inside," mostly of course, political and social, but to which we call attention in consequence of the testimony given by this member of the House of Commons, who is also a medical man by training and profession, in regard to the ventilation of the building, about which such exaggerated complaints are made from time to time. We have always maintained that these complaints are in the main either those of faddists or of nervous or discontented persons who must always have some grievance or other. This is Dr. Farquharson's testimony:—

"Every year, just before the meeting of Parliament, an agitation is started during the 'silly season,' when journalistic material is running short, about the ventilation of the House of Commons. It is the most all-embracing microcosm, and those who have never sat on the green benches gravely inform those who do that their health must seriously suffer from living in such an unhygienic atmosphere. Fortunately for the most credulous among us, this subject has been most carefully threshed out before three Parliamentary Committees, on all of which I sat, and which gave, on the whole, very encouraging reports. The situation of the Speaker's lobby is hardly to be doubted, for it is on the banks of a sluggish tidal river, the air from which must be relaxing in quality, and now and then broad reaches of slushy mud would soon to challenge the attention of the sanitary inspector. No doubt, in the Strangers' Gallery, and that study hole the ladies' case, and the quarters allotted to the fourth estate, the atmosphere, gas-heated, and breathed and rebreathed by crowds of legislators, can hardly be regarded as typically breeding. But down below, where we sit, it is wonderfully fresh and free from the faded stuffiness which makes itself painfully obvious in every other large public building with which I have any practical acquaintance, and the evidence of experts, taken before the House of Commons Committee, confirms me in my belief that, considering the sources of supply, the artificial methods of ventilation, the foreign material carried in by members' boots, and blown about by the currents of wind streaming through the perforated floor, and the habitual overcrowding of the House from time to time, the air is wonderfully pure and good, and cannot do harm even to the most lazzini legislator."

In the *Antiquary* we have the second portion of Mr. Bailey's article on "The Wynne Brasses at Llanwrst," the second illustration showing a remarkable and unusual example of a brass in an exceedingly florid style of rococo decoration, surrounding a realistic half-length portrait. Mr. Stevking's article on "St. Hild and her Abbey at Whitby" is a tribute to the memory of one who, even from the somewhat vague tradition history, was in her day a great spiritual power.

Good Words includes an article on the picturesque subject, "Sussex Striles and their Surroundings," by Mr. J. Harris Stone. The Sussex stile, however, according to the author, seems to lack decisive local character, and to be in fact of a very varied physiognomy:—

"Some are made of odd pieces of old wood—if near the sea, of wreckage. Others are constructed with concrete steps evidently made like a pudding in a zinc pail and turned out. Others again are made over flint-peg walls, by cutting away a portion of some 3 ft. run, lowering it by some 2 ft. and smoothing over the top of the indentation with cement. These latter are characteristically Sussex, and pebbly walls being naturally at least a foot thick, are not the easiest form of stile to surmount."

Notices on some other periodicals we are obliged to defer till next week.

SOCIETY OF ARTS.—The Society of Arts will commence its fourth half-century on the 16th, when Sir William Abney, as Chairman of the Society's Council, will open the 151st session with an address. The subjects on which papers will be read at the meetings before Christmas include British Trade, Canals, the St. Louis Exhibition, Patent Law, Burma, and Street Architecture. There will also be a course of lectures on wind instruments, with musical illustrations.

WESLEYAN SUNDAY SCHOOL, COTTINGHAM, NEAR HULL.—The new Sunday school in connexion with the Wesleyan church at Cottingham was opened on the 3rd inst. The architects of the new premises are Messrs. Gelder & Kitchen, of Hull, and Mr. F. Bilton, of Hull, was the contractor for the erection. It is a red-brick building, with stone facings. The interior consists of a schoolroom in the centre, which entrance is a gallery, of pinewood. Above the side are four classrooms, two of which open out of the upper gallery.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The first Ordinary General Meeting of the Royal Institute of British Architects was on Monday evening at No. 9, Conduit-street, Regent-street, when Mr. John Belcher, A. President, occupied the chair.

The minutes having been taken as the following gentlemen were formally elected for the first time since their election: Mr. Frank Dicksee, R.A., Hon. Assn. Mr. H. L. Goddard, President of the Leicester and Leicestershire Society of Architects; Mr. John Keppie, President of the Glasgow Institute of Architects.

Statutory Examinations.

The Secretary, Mr. Locke, announced that the Statutory Examinations, held at the Institute on October 20 and 21, nine candidates were examined and the following passed: Mr. Percy John Black, Lambourn, Clayham, S.W.; Mr. John Moir Kerr, Railway-approach, London-bridge, S.E.; John Todd, Billericay, Essex.

He also read a list of gentlemen nominated for membership in the various classes.

Deceased Members.

Mr. Alex. Graham, Hon. Secretary, he had to announce the decease of members since the last meeting, *i.e.*, R. Freeman, of Manchester, Fellow, elected F. Manoah Kent, of Natal, Fellow, elected last March; Arthur Green, Fellow, 1879; P. W. Barrett, of Cape Colony, Assn. elected 1888; E. Simm, of Canada, Assn. elected 1902; W. Henry Arber, Assn. 1878, Fellow 1893; E. Baldwin J. Knox, Assn. elected 1877; J. Lewis Thomas, Hon. Associate, elected 1897; and Mr. Kerr, Fellow, elected 1857. Professor was a very conspicuous practising architect and as one of the founders and the first President of the Architectural Association he drew their gratitude for having initiated a movement that had been attended by such very success, especially in recent years. Mr. Kerr was a constant attendant at the meetings of the Institute until his health broke a few years ago, and he was one of those who was very enthusiastic in all he took to. On some occasions it might have been said that the Professor was a little too aggressive in some of the things he said in debate that was perhaps due, as was the case with many men of similar character, to a strong and very earnest thought, and beneath there was an under-current of good-will and good will towards everyone; and who knew him well realised the earnest motive in everything he took up. The profession was indebted to Professor for many things. Quite apart from his connexion with the Architectural Association the Institute was indebted to him a suggestion to found the Standing Committee of Art and Literature and Science and on those committees, as most men who aware, had done great service for the Institute; they had been indirectly great benefit to many members in all parts of the world, and they had also together hundreds of the members met to discuss matters of great importance not only to the Institute but to the public. In regard to the Architectural Association, which had just achieved marked success, he hoped that when it was written, a prominent place would be given to Professor Kerr as one of the pioneers of architectural education in this country (the speaker) desired to move a resolution which he knew would be accepted by a member of the Institute, that a letter to the relatives of their deceased sympathising with them in the loss sustained, and expressing the full approval of the Institute of the many services rendered by the late Professor Kerr during his life and of an active career in the cause of art and architectural practice.

The resolution was then silently agreed to.

President's Address.

The President then read the following address:—

COLLEAGUES, LADIES AND GENTLEMEN.

It has been the custom of the Institute as I dare say you all know, for the President to open the new session with an address in review the important events of the last session, and also to say a few words

existing condition of our national architecture as a whole. Before entering upon a task I desire to thank my colleagues for honour they have done me in electing me resident—an honour which, coming as it from my brother architects, I am sensible peculiar distinction. It is not without a feeling that I enter upon my duties, for the responsibilities attached to the office, I know how difficult it will be for me to discharge as President of such exceptional qualifications and ability as my predecessor, Mr. Aston Webb. We all recognise and appreciate that Mr. Webb has achieved during his office, but his colleagues on the Council know how greatly his work has been to the advantage of the Institute. His artistic attainments, his genial manner and ready tact secured for him the widest popularity and success of the President's "At Homes," inaugurated, has been most marked. We have afforded opportunities for social intercourse and the exchange of ideas, and on occasions on which the experience of riper years has been readily placed at the disposal of younger brethren. The designs and sketches also, which have been exhibited, proved both attractive and helpful. I hope, therefore, by your favour, to continue pleasant gatherings, from which "My Nicotine" will assuredly not be banished. Turning to matters of more general architectural interest, the past year has been distinguished by events of unusual importance. The laying of the foundation-stone of the Cathedral of Liverpool—probably the most Gothic cathedral to be built in our days—a unique occasion, and its significance recognised by His Majesty the King in attending the ceremony. The greatness of the work and the importance of the city, combined with the desire of the citizens that the work of their faith should dominate this centre of commercial enterprise, mark it as an event in the history of architecture but in our national life, and one which should materially improve the lives of the toiling masses. We have watched with interest every stage and every step in the growth and development of this important building. In the genius of Mr. Scott, who has inherited the traditions of a talented family, and in the supervising of that most learned and profound exponent of these methods, Mr. Bodley, R.A., we have assurance and guarantee that the beauty and excellence of the work will be complete. Another great undertaking which has been undertaken is that of the Memorial to our late Queen, designed by Mr. Aston Webb. Already the outline of the new road in the Mall, with its avenues of trees and approaches to the Memorial, is complete, and has been greeted with approval and commendation. The points which mark the points of divergence in the several roads and avenues show how well these are set out. Not only are the existing approaches—with Constitution Road brought into unity, but they are so arranged as to open up new vistas. At one point, for instance, a fine open turfed way leading across the Green Park will be viewed through elaborate iron gates and piers with effect. Mr. Webb has certainly made the most of his opportunities, and when all his plans, including the arching, is completed we shall anticipate a result of which we shall be proud. The present unfinished aspect of the work from which the main architectural features are lacking, can give the public but a faint idea of the beauty and harmony of Mr. Webb's entire scheme. In this connection I must say that the very commonplace exception taken, to which so much exception has been taken, are only temporary, and will, I soon be replaced by others specially designed by Mr. Webb himself.

The Indian Memorial to the Queen has also been taken in hand. Owing to the nature of the site chosen the foundations for the superstructure designed by Sir William Emerson have met many difficulties, which, however, have been overcome by methods of considerable ingenuity. We shall look forward to having the plans and description of this interesting building before us in due course.

The contemplated extension of the British Museum—so long needed—has been entrusted to J. J. Burnet, whose excellent Greek work so fully entitles him to this distinction. Amongst the events of the year must be remembered the bestowal of the honour of Knighthood on our colleague, Sir Henry Tanner, whom we sincerely congratulate on so well-deserved

a reward for his eminent services. A proof surely, this, of the awakening interest and increasing regard which our beloved art is beginning to inspire in the minds of those in authority.

Before passing on I desire to remind you of the great International Congress of 1906, which, as you are aware, is to take place in this city. The necessary preparation and organisation for this important event are already well in hand, and will continue to occupy the attention of your Council. I have the honour formally to announce that Sir King has graciously consented to be the Patron, and the Prince of Wales the Honorary President of the Congress. The occasion will be in the highest degree interesting and important—fruitful, too, we may well hope, in opportunities not only for advancing the true interests of our art, but also for drawing public attention to its value and importance as a factor in our national life and education.

It is to this end that our Institute should always be directing its efforts. We are something more than a Trade Union—we are a corporation whose members are called to rise above the differences which so often distract the artist, and to act harmoniously as from one centre, to the end that Architecture may flourish as a fine art. The Institute's growing influence brings, of course, distinction to its members, which distinction, however, must be honourably earned—won, in fact, by force of merit rather than demanded as a right. The increase in our numbers gives proof of vitality and vigour, but this involves greater responsibility, and an obligation to let the audacity of youth give place to the growing caution and dignity of maturer years and riper experience. We may, perhaps, differ among ourselves as to the true line of advance, but we are all, I believe, actuated by the same loyal desire, and all ambitions to see the Institute firmly established in the honourable position it has earned. We must see to it, then, that the foundation is secure before we attempt to add to the superstructure. We must, in other words, know something of our limitations as well as of our influence and power, bearing in mind the old lesson of the nut and the nutcracker—if the crackers are not strong enough to crack the nut, the nut will assuredly be hard enough to break the crackers. The purpose and work of the Institute are not limited to the great metropolitan interests. Unlike the Allied Societies which are represented on its Council, and which are mainly concerned with local and personal matters, the Institute as a corporate body has a duty towards the whole profession, and its Council, in weighing the many difficult problems that come before them for solution, have to remember this greater responsibility, this more extended obligation.

Registration.

One such subject before the Institute at the present time is the question of Registration. Registration is apt to be somewhat hastily regarded as a panacea for all ills, so that the very sound of it breathes comfort, like "that blessed word Mesopotamia" in the story of the old lady and the sermon. The simplicity, however, of the operation or process of registration must not be taken for granted. A clear definition of its practical working and effect will, no doubt, be elucidated in time; but as this is the task upon which the Committee specially appointed by the General Body are now engaged, I feel it would be better for us discreetly to keep silence until they have reported upon it. Moreover, as there is considerable diversity of opinion, it will be well to hear both sides before coming to a decision.

Architectural Education.

There is, however, one matter, affecting both ourselves and the Allied Societies, upon which we are all agreed—viz., the special education and equipment necessary for an architect. Some carefully-devised scheme of training is in reality that proper foundation to which I have alluded, and must have precedence of all other claims upon our time and attention. I congratulate the Institute that during the past Session an efficient "Board of Architectural Education" was established. This scheme was brought before you by my predecessor, under whose able guidance it has come to fruition, and I am glad to inform you that Mr. Webb will continue to act as Chairman of the Board. The distinguished men who are associated with him are in themselves a sufficient guarantee that the result of their labours will be far-reaching and beneficial. Several meetings of

the Board have already been held, and the business in hand is far advanced. Their scheme will shortly be before you and, I hope, in active operation before long.

The Public and Architecture.

Another cause for congratulation is the growing interest of the public in architecture—an interest evidenced in a variety of ways. It is obvious that side by side with a more systematic training of the architect, some attempt should be made to educate the public. At the very least we might set before them fundamental principles and elementary axioms, that they may know what to appreciate and what to avoid. This might be partially accomplished by lectures in the large cities and towns, under the patronage of the local authorities; also by the distribution of short papers or pamphlets on the subject for the use of schools, art teachers, and others. Unfortunately, at our great centres of learning, which should have given a lead in this matter, the study of architecture has been made subservient to archaeology; it has been a handmaid to other interests rather than a queen in its own right. The result is only what might have been expected—viz., that architectural work of all sorts, good, bad, and indifferent, has been judged and appreciated (or the reverse) not upon its merits but according to its antiquity. Archaeology has thus been an unconscious cause of the decay of architecture as a living art. But, it may be asked, are not the technical schools educating our people in a knowledge of architecture? Scarcely. They impart a knowledge of the methods and science of building construction, but what is needed by the general public is not so much a technical knowledge as a discriminating taste moulded and set upon elementary principles, a discrimination which will enable them to approve what is excellent and reject what is inferior. In the XVIIIth century the education of a gentleman was not considered complete unless he had acquired some knowledge of the rudiments of architecture, and a refined taste in the appreciation of its beauties. Too often, it is true, the dilettante thus inspired attempted to express his ideas without the aid, or with only the partial aid of the professional architect, and fell into the many errors and mistakes into which a little learning is always so apt to betray a man. Such rash experiments are to be deplored, but the interest in and appreciation of art which prompted them is one of which we might well seek to revive.

In this good cause I believe the power of the Press may be reckoned on. In an admirable and interesting article in *The Times* of 3rd September last, from which I should like to quote more fully, the writer, after stating that every Town and County Council is making effort to establish some kind of technical education among the people, adds: "The want of such an education in England, and of a rudimentary knowledge of design, has been matter of complaint during many generations, but until quite lately the complaints have fallen upon deaf ears." Again, after drawing attention to the general neglect of decorative artists in the past, who had to abandon their art because there was no demand for it, he writes, "Things have changed a good deal in the last forty years, and there is now, at least, no want of schools of art or of the encouragement that is given by an enthusiastic, if rather uninformed, public opinion." It is this uninformed public opinion which is the difficulty and the danger, and I hope a committee of the Institute may be appointed to consider the subject, and to suggest something that may be done by way of remedy.

L'Art Nouveau.

In these days, supply (of a sort) follows hot-footed upon the heels of demand, and the quickened public interest in art was promptly met by the abominable affectation (I should like to use a stronger phrase) of what is known as "l'art nouveau." A new art forsooth! A pernicious trick easily acquired and applied alike to buildings or jewellery, furniture or dress; no matter what the nature of the material, whether iron or wood, stone or glass, all alike twisted to curves representing the final stages of vegetable decay and animal decrepitude, in defiance of all true principles of construction and beauty. In *The Times* article I have quoted from, an incident is related of an intelligent French workman who, passing through a museum with an Englishman, after contemplating a Riesever cabinet, turned to an "art nouveau" chair (alas that it should have been there!), and delivered his soul as follows:

"In the old days they had ideas; but as for this chair—well, it is the art of fools suited to an age of fools." In correcting such false ideals as "l'art nouveau" holds up to the public admiration, the Press can render powerful aid, but we must do our part also by supplying principles to direct and mould the taste of the people in matters architectural.

Public Authorities and Architecture.

Fortunately, the County Councils and other public bodies acknowledge the advantage to the community of these artistic influences, and are able to their importance in trade and commerce, but have they ever yet regarded them from the point of view of the public health and morals? If legislation is necessary on sanitary matters that the public may be protected from insidious poisons conveyed through the senses of smell and taste and touch, may it not be equally important to protect the sight? Environment insensibly influences the development of all forms of life, and it cannot be doubted that the squalid conditions, horrid forms, inharmonious colours, and injurious sights amongst which such a large proportion of our urban population spend their lives, contribute their quota to the sum total of degenerate moral tendencies of which recurring acts of crime are the inevitable outcome. Even the untrained have sensibilities to be shocked and blunted, and if the effect of a gloomy and monotonous environment be bad, what shall we say or think about the cumulative moral effect of those wildernesses of mean streets and horrid buildings by which our great cities are disfigured? There must be no concession to what is bad or even mean in architecture if a healthy and manly condition of the people is to be maintained. This aspect of the functions of good architecture should be considered by the authorities who watch over the needs of the community.

And may it not be that many who do not live in mean streets are yet suffering, perhaps unconsciously, from the conditions by which they are surrounded in the public thoroughfares, their senses assailed by a multitude of petty annoyances amounting in the aggregate to a heavy burden from which they would fain escape? It is a well-known fact, for instance, that an ill-designed building looked at suddenly will cause an involuntary shudder in a man with a trained eye, while certain bad forms as well as bad smells will produce a feeling of actual nausea. Any and every enticement of the senses, in opening up hitherto unknown avenues of delight, brings with it also increased discomfort, for it reveals defects of which we were formerly unconscious. All forms of knowledge have this or a similar drawback. Rudyard Kipling puts it from the moral side in a very telling form when he makes our friend Tommy Atkins sing the praises of some place he had discovered (Was it Mandalay? At any rate it was "east of Suez"), "where there ain't no bloomin' ten commandments," or words to that effect. But seeing that we have our ten commandments, or our canons of art, as the case may be, our moral principles and our artistic tastes, every violation of which brings its fore-ordained penalty, surely we may look to the authorities to defend us from all the hideous sights and sounds and smells which force themselves upon us in our public thoroughfares, whether urban or suburban.

Architects and Buildings.

The object which business-men have in view in choosing or designing or rebuilding the frontage of their premises is to arrest the attention of the passer-by. To catch the eye—that is everything. They succeed sometimes, alas! too well by what is practically a severe shock to the nervous system of a man of taste. The buildings they erect are marked by such a vicious extravagance in material and so-called ornament, and display such an eccentricity of forms as will not only effectually catch the eye of the passing wayfarer, but will certainly also "land him in the interior"—if not in a physical, in a metaphysical sense.

The coarseness and vulgarity of these methods need not be wholly attributed to architectural design—though certainly once the author of a work of this class, when remonstrated with, did boast that he was a "commercial architect," and that his clients wanted "the most show for their money." This advertising mania is the cause of much which we deplore in our street buildings. If the law can restrain street cries and noises because they affect the nervous

system, surely it may well undertake to control the blatant architectural efforts which may truly be said to "cry aloud and shout" in our public ways.

Some effort has been made to control advertisement signs, those modern eyesores which, not content with disfiguring our good buildings and important places, have also intruded themselves upon the beauty and repose of the rural landscape. Heavy taxation is too mild a penalty for these, especially when they blink.

Then, again, the increased height of buildings contributes largely to that atmosphere of gloom which pervades some of our streets. I am not objecting to lofty buildings on special sites or where the road is wide enough, nor are architects to blame if they show a willingness to add as many stories as are required. The responsibility rests with the ground landlords, who insist upon raising the ground rents whenever the opportunity occurs, so that additional stories must be built to meet the increased demand. Owners who are privileged to possess land in important areas should be under special control. If certain well-defined rules were laid down applicable to all such places and sites, they would serve for the guidance of those who purchase property or obtain leases in those neighbourhoods, and freeholders would thus be restrained from demanding excessive ground rents.

Public Improvements and Artistic Control.

My predecessor in office strongly urged the need of some authority to whom schemes of public improvements might be submitted, not necessarily for sanction but for consultation and advice—a suggestion which Lord Windsor was good enough to endorse, and has since sought to get adopted. This is a great advance, but I should like to press the matter still further. Consultation and advice may be sufficient in many cases, but there are others where the First Commissioner should have power to decide and determine. Artistic needs must be insisted upon, more particularly where considerations of finance are likely to exercise an undue if not tyrannical sway.

Quite recently, when some important improvements were suggested in the Strand frontage of the new street, the members of the County Council appointed to meet the artists belonged to the Finance Committee of the Council, and, as was to be expected, showed but little sympathy with artistic ideals. Yet artistic treatment has a financial value of its own, as owners of property are beginning to find out—for where the requirements of art are listened to, property is more eagerly sought after, and its value correspondingly enhanced. Not long ago the *Globe* newspaper drew attention to this subject in a short article, *à propos* of a paragraph in Sir Arthur Conan Doyle's address to the Incorporated Society of Authors. Sir Arthur, while recognising the desirability, even the necessity, of a strain of artistic blood in the body corporate of the London County Council, did not seem very sanguine, for he calculated it would take a man with the talent of Michael Angelo, the despotic power of Napoleon I., and the all-round energy of the Kaiser Wilhelm to make this city of mean streets and of the commonplace to be what it should be—a fitting centre of the greatest empire that the world has ever seen. No doubt the qualities here so tersely epitomised would prove advantageous, but how much might be accomplished in this direction if only the First Commissioner of Works, acting as a Minister of Fine Art with the aid of an Advisory Committee, possessed the necessary despotic power to see the right proposals adopted. This is above all imperative in the treatment of our public places, in the formation of new thoroughfares, and in dealing with spaces and buildings around our public institutions.

Again, where buildings should be considered in relation to their surroundings, where they must be in scale, and accord in breadth of treatment, and where other similar claims of art must be considered if the proposed work is to be in due relation to and in harmony with the existing or determined general scheme, all these are cases where the power of authority may well be invoked and exercised on behalf of the best interests of the community. A Building Act is of little or no good here. The law can determine the height of buildings, fix the size of lighting areas, and so on, but no mere Act of Parliament can define the subtle qualities and delicate nuances which distinguish good art from bad, or rather shall we say which separate art from the lack of art. In France

and in the States, both of them lands of free some such exercise of authority as I am deating has been found necessary—why here?

Ancient Lights.

I am by no means suggesting a mechanical or despotic control such as would engender a monotonous uniformity and ultimately a loss of individuality, but a freedom of control—for freedom without control is licence and licence tramples under foot all consideration for others' rights. This is the one side, the other, so-called "rights" may be used and oppressively insisted upon. The terror for instance, of "Ancient Lights" has recently been prejudicial to architecture, a short time since it culminated in such reasonable demands as to paralyse all building operations.

We in this City, and indeed the country, owe a debt of gratitude to Mr. H. C. S. for boldly withstanding the legal op of the courts and appealing to the House of Lords. A clear and satisfactory judgment has thus been obtained on the question, establishing a principle of law which will remove both property owners and the public from formidable restrictions. To the architect must come as a relief, for the difficulties he has to encounter in the exercise of his art are harassing enough without the added litigation, which must necessarily hinder from giving that thought and devotion to art which the case requires. It will not be forgotten that an Easement of Lights introduced by Mr. Fletcher Moulton, K.C. on behalf of the surveyors and ourselves, has before Parliament the last two sessions steps will be taken to continue its progress when Parliament meets again. The Bill, believe you all know, covers the ground of Colls v. Home and Colonial Stores cases provides a simple machinery for arbitration.

The Growth of Suburbs.

Light and air have long been brought together, and, indeed, in most cases they go together. There is, however, one important respect, attention to which has been given in the columns of the *Times*, in which question of air calls for separate and independent consideration. In the extensive suburbs of cities and towns the public demands that the buildings should be far apart and the open spaces larger. In fact they are removed from the centre. In Germany the authorities regulate the growth of suburbs. Different heights and different degrees of proximity are prescribed according to locality. Towards the centre five stories the limit which the houses must be detached certain directions a larger area must be reserved for the wind to blow freely about the houses. Our London suburbs are becoming a source of considerable danger. Here the houses are smaller, but they are so closely packed crowded with unhealthy subjects that the air which passes over them to the centre is becoming denser and more impure every successive year, and should a serious epidemic spread of contagion to the great city and thence again outwards seems inevitable. The lungs of London, as they are regarded, must not consist solely of the open parks, which, after all, are now or less closed in, but of wide channels and for entrance of air to flow freely through. This is a matter I commend to the attention of our Town Councils.

Borough Surveyors and Architectural Work.

One of the questions raised by my predecessor, and still under the consideration of the Council, is the growing habit of employing a borough surveyor or engineer on what is professional architectural work. It is true official is usually a man of considerable capacity but the very nature of his ordinary work stands in the way of architects' artistic accomplishments. The Committee pointed to report upon the subject have shown in a very thorough and excellent way. They have ascertained the custom and conditions existing in other countries, a result of their labours will be condensed published in the *Journal*. It is proposed to take steps to bring the matter to the notice of the public authorities and others who are concerned.

It has been urged with much show of force that our Institute ought to afford legal protection to its members in legal

men these matters are wrongly forced upon them, and are of such a character as to prejudice the interests of the profession. The principle has been approved by the Council, and a Board established, called the Board of Professional Defence, which, under proper restrictions, will be empowered to deal with such cases as come within the above category.

The increasing usefulness of the *Journal* in dealing matters of importance to our notice leads me to suggest that this usefulness might be extended if members would more freely communicate matters of general interest—either in the form of letters to the editor or of short articles—drawing attention, for instance, to buildings or objects of interest seen during their vacation, that others may be led to visit the same locality. There is scope also for short descriptive papers on various subjects connected with our methods or work, and such papers would often prove of great value and interest to readers of the *Journal*. The opportunities afforded by the sessional papers for imparting information are necessarily few, but the *Journal* may to some extent make good the deficiency.

Condition and Prospects of Architecture.

These, gentlemen, are some of the minor matters which interest and concern us as architects. I should like to add a few words on the general condition and prospects of our art in this land.

Those of us who have watched the steady improvement in English architectural work during the last few years cannot but experience a measure of satisfaction and even of pride in the progress which has been made. Our liegemen on the Continent and in America do not have been inclined to regard architecture as a dead art in this country, are already awake to the fact that there is more vitality and advance being exhibited here than anywhere else. Many American friends who have been absorbed by the excellent French methods they have studied have recently expressed to me their admiration of certain hitherto unsuspected qualities and beauties in our English work. This is both gratifying and encouraging, especially as under our unfortunate climatic conditions we are constitutionally prone to little everything that is of us or around us. Do not imagine, however, that our friendly critics have not been discriminating. "A man," said Ruskin, "may hide himself from you every other way, but he cannot in his work; you have him"; and our critics have indeed us, sometimes, to our confusion of face for our shame.

We cannot however fail to observe that there is a growing demand for the best and best work, and as the appetite for what is good is whetted, all that is vulgar and bad will come repugnant and tend to disappear. As the sunshine of popular favour shines upon our art it must advance. Side by side with the good it will still flourish the ill weeds, those vulgar street buildings and fantastic fripperies which flaunt and force themselves to the front. Let us may take heart even from these, for they are a sign that there is something they are fighting against which will eventually be subdued at its true worth. Let them alone, they must come to grief. If "experience is the dress of thought," then a building is bound to reveal its true character at the last. If it litters for show it proclaims that which is false and weak. "To dazzle let the vain sign," said Pope; "to raise the thought and such the heart be thine."

Architecture must tell its tale; it has its message to deliver. Like a musical score it presses a great deal more than meets the eye. Its meaning is hidden behind the veil of outward symbol. It is a mystery whose voice is heard speaking according to each man's mood, capacity and temperament. Just as the words of genius have a profounder meaning than the actual thought that prompted them, true architecture possesses the power, as by magic wand, to "call up spirits from the vasty deep"—from the ocean of human thought and passion.

Art speaks in all its manifestations alike. Every picture, every group of sculpture, every unusual composition is a vehicle for the conveyance of thought in poetical form. Architecture is the prose of inarticulate but beautiful thought and feeling. Sometimes it tells of the commonplace in life; rising higher it speaks of domestic peace and happiness; and yet again more stately diction it sets forth the grander

and larger purposes of life. It recounts the past, records the present, and holds up ideals for the future. But only when it is enriched from the sister arts of sculpture and painting can it tell the tale with the fulness of eloquence and power—for then it speaks to the heart in tender and solemn tones of all that is most grand and beautiful in life and humanity.

It is a pleasure to see that such has been done in recent years to cement and confirm the alliance of the arts. The brotherly readiness of the sculptor to aid in the good cause should be recognised, and his name coupled with the architect's in all such work. If the building is to be harmonious in expression these two must work together from its conception, and the sculptor must have a fitting and honourable place assigned to him whence he may take up his parable with effective force. Not a new or separate *motif*, but the same with new progressions, a harmony with one delightful melody. When, further, the orchestra is increased by calling in the painter's art, then, like the vibrating strings with their soul-stirring chords, the refinements of tone and colour appeal to the heart with a new and higher power based upon the primal sympathies and emotions of the human breast.

Why, then, we may ask, have these arts so few opportunities of joint action? Is it not because architecture has forgotten her place and lagged behind? Is she not like Lot's wife, who, looking back, was stiffened into a pillar of salt? Looking back, there lies the explanation. The sister arts of painting and sculpture have been the while advancing; they have developed, but architecture has stopped short and been content to look back to the past, to draw upon old periods and reproduce "defunct" styles, so that the living arts of the present age could no longer associate with one that was a mere mouldering survival from bygone times. A special architectural carver had to be trained to forge or imitate archaic forms and reproduce the quaint and grotesque figures of almost forgotten centuries; while the painter has given place to the "firm of decorators," and his message to the dumb extravagance of mere costly material.

All this, I believe, will soon be past history, a vanished nightmare, for a new era has undoubtedly begun. May we not justly feel sanguine? After all, the great thing is not so much where we stand as in what direction we are moving. It is no question of style. Every period has contributed something to our art. Gothic, with its rich luxuriance, has been the foster-home of the crafts, and if the crafts themselves seem to have lost their independence and vitality, it is because having had a part in beautifying the "styles," they have, like them, been made to serve in the copying and forging of bygone examples. Without denying that in the hands of true genius these past types may be taken up and carried forward, yet it is rather with the Renaissance forms that modern sculpture and painting can best and most easily be associated. It is natural perhaps, that I should have this confidence in the development of the Later Renaissance. There, at any rate, it will again be possible to co-operate with one's brother artists, and that must be a step in the right direction. There is in its methods a freedom, a vitality, and a power of adaptation to modern requirements which surely stimulates conception and fosters growth. There is, too, a characteristic wealth of stateliness and grandeur fitting it for all high and noble purposes. The genius of Inigo Jones, and subsequently of Wren, taking it up, each at the point at which he found it, carried it on far beyond its huddling efforts, and established it as a great English tradition. Here is the "quarry," and, to quote the words of Goethe, "He does not deserve the name of architect except out of this fortuitous mass he can combine with the greatest economy, suitableness, and durability, some form the pattern of which originated in his own soul."

Let us be enthusiasts. Our national architecture is not dead; there are many signs of life and movement within it. The spark is there; let us blow upon it and the fire will burn. Let us encourage and stimulate the energies of those who, with the love of their art burning brightly, seek not arrogantly for something new, but to advance that which they have proudly inherited, and to make its influence for good ever more and more known and loved.

Mr. Frank Dicksee, R.A., said he had been

asked to propose a vote of thanks to the President for his very interesting and illuminating address, and he undertook the duty, though with no hope of adequately expressing either their pleasure or his own with the President's effort, but merely to express his own tribute of appreciation of what the President had said. He thought he ought to confine himself to this, for he had a little hesitation in approaching the subject of architecture. As a simple-minded painter, he might, perhaps, step in where architects fear to tread, because he knew there was such a difference of opinion and aim that it was rather risky, even if one had fixed opinions, to adopt a side. He had been much interested in the address, and to those who were not acquainted with all that was going on in the architectural world it was most edifying to be informed in that short and summary way of the chief incidents of architectural activity of the year. What interested us in London especially was the Queen's Memorial, and he had had the pleasure of seeing the model that Mr. Brock had elaborated, and he felt confident that it would be one, when the whole thing was finished, of which Londoners would very justly be proud. Another subject that interested him very much was that of the education both of the architectural student and the public—the one, perhaps, much more difficult than the other—and he keenly sympathised with the attitude that the President took up with regard to the interchange of the three arts. He did not think that anyone in the profession had been more influential than Mr. Belcher in associating sculpture and architecture, and it was no fault of his if painting had not been included. He was quite sure that when Mr. Belcher had the opportunity he would admit the painter to the same privilege of sharing his triumphs as the sculptor already possessed. He thought it would be a very good thing if in our schools there should be an interchange of study on the part of the students. It was a thing which they had to a certain extent initiated in the Academy schools, where facilities were given the architectural student to study in the painting school or at least in the drawing school and the modelling school—and sculptors in the Painting School and Architectural School, and so on, and he imagined that there would be a great gain brought about by such a change in the ordinary course of study. But the education of the public was, he fancied, a much more difficult matter, and when there was such uncertainty amongst the leaders—amongst those men who should lead activity of thought in this matter—it was a little difficult for a complete outsider to know what to do. We were told that the beautiful Gothic art was dead. Well, he was almost afraid that that might be so. There was no doubt that for architecture to be really successful in its aim it must contain within itself the spirit of the time, and also the spirit of these times was not that which would encourage Gothic art. What was the spirit of the time? Utilitarianism, science, and advertisement. Now utilitarianism was good; science was excellent—he did not think that that could be said of advertisement, but that was the most marked characteristic of the age, and any art expression we ventured upon had to fight this spirit of advertising, and it was a very serious drawback to the expression of any form of art, for instead of being helped by the spirit of the age it was hindered. He thought that if that were made clear to the public—*i.e.*, that it was not those who shrieked the loudest who were the most worthy of attention—it might lead gradually to the formation of better taste on the part of the public, for he was perfectly sure that there was an immense amount of talent in this country which needed only encouragement to fulfil all manner of enterprises which would strengthen and beautify the nation in every way. If we could so enlarge our sympathies that we were not bound to be only Gothic or only Renaissance, or only Classic, but to have a sufficiently wide sympathy for all these various expressions of art, to understand them all, and then in times of judgment to decide which was the best expression for the particular instance contemplated. He most bitterly regretted that Newgate Prison had gone, for it was a splendid bit of work, and you had only to look at it to know it was a prison; it bore the stamp of what it was. Of course he should be sorry to see many of those Newgates about. If we wanted to build something of the kind now, that manner of architecture would be out of date, but for that and some things it seemed to be the best possible. He hesitated to speak about Gothic art, for to

him in its day, when it contained within itself the expression of the life of the people, it was the most beautiful architecture of the world. The mystery of it and the religious sense which it awakened, and the way it gloried in the magic of colour and stained glass made it, take it all in all, the most beautiful expression of architecture that the world had ever seen; but to attempt any ambitious work in Gothic art now was risky, although in competent hands it was still possible to have a most beautiful expression of art conveyed even in modern Gothic. He desired to pay a tribute to the President, for it seemed to him that the essential principle that the President had placed before him was devotion to beauty. It was Emerson, he believed, who said that, "Though we travel the world over to find the beautiful—we must carry it with us, or we find it not." It seemed to him that that was what Mr. Belcher had done: he had carried the sense of the beautiful with him wherever he had gone, and that, combined with his loyal endeavour to combine the arts of painting and sculpture with architecture placed him in a position which commanded their greatest admiration and respect, and they were proud that such a man should be placed at the head of an Institute like that—with his great capacity in his art, his devotion to beauty, and his keen enthusiasm for the welfare and fame of a profession which in dignity and worth should be second to none.

Sir Benjamin Baker, K.C.M.G., said his only qualification and his only excuse in seconding the vote of thanks was that he was a very old and very appreciative friend of their President. He had watched Mr. Belcher's career, and he was especially pleased to see him in the position which he occupied that night, which would do honour to himself and be of great benefit to the Institute. The President had touched on many topics, and in his work he illustrated that he was not only a preacher, which was generally dull work, but he followed out his own maxims, and he thought that the works of Mr. Belcher would do more to educate the public in the way he desired than his address. He quite agreed with the vision of a wilderness of mean streets that the President had spoken of as a hopeless problem to attempt to solve. In connexion with the Traffic Commission he had lately been a good deal in the suburbs of London just to see where the people spring from and where they had to go to be accommodated. It was not that matter that had most interested him in the President's address, but rather what was said as to the vicious extravagance in material and so-called ornamentation, and that was most prominent in the extreme East End, and particularly near the Angel, Islington—an extravagance that dominates the whole world at the present time. How could they hope for art to be dominant when they saw women dress as they do in some parts of London, with their artificial pearls, for instance, which would be worth 10,000*l.* in individual cases if they were real. It made one shudder almost, and it was not confined to London and the cities of England. In Ireland some twenty-five years ago if one saw a donkey cart with a pretty girl in it the girl had no head covering at all; she had a shawl, and that was drawn up to cover her head if it rained. That was not the case now, and you never could tell what a girl would dress in, and all the joy was taken out of the thing. That being so, the problem of educating the public was a most difficult one. He could not imagine how Greek architecture or sculpture would have fared if the Greek women had dressed like that, and how the difficulty was to get over he did not know. He might paraphrase a remark he heard the Italian Ambassador say on a similar occasion: "Since my boyhood I have been married to science, but I am a lover of art, and that must be my excuse. The President happily occupied a middle seat between art and science, and in his work he combined both.

Mr. Graham then put the vote of thanks to the meeting, and it was very heartily agreed to. Mr. Belcher, in reply, said that they had heard two most distinguished representatives of science and art. He felt that as science and art formed the component parts of good architecture, all that those gentlemen had said had been most valuable and interesting. The President announced that the next meeting will be held on November 21, when a paper will be read on "Monolithic Constructions in Hennebique Ferro-Concrete," by Mr. L. G. Mouchel, and one by Mr. W. Dunn on "Construction and Strength of Reinforced Concrete." The meeting then terminated.

THE LONDON BUILDING ACT.

The General Purposes Committee of the London County Council brought up the following report at the meeting of the Council on Tuesday:—

Standing Orders and Regulations under the London Building Acts.

"We have had under consideration the desirableness of advising the Council to make certain alterations in the standing orders and regulations under the London Building Acts so far as they relate to the submission of applications under the Acts, and to street naming and numbering. The alterations have been suggested by the Building Act Committee, and the late Historical Records and Buildings Committee have also approached us on the matter. The alterations suggested by the Building Act Committee are not intended to introduce any new practice, but simply to make clear to applicants what is required of them in the way of plans, particulars, etc., with a view to saving delay in dealing with applications. Many of the alterations suggested by the late Historical Records and Buildings Committee, are of a minor, and, in some cases, of merely a verbal character, but where they are of a more important nature, we draw special attention to them. . . . The new matter is printed in italics.

"Regulations as proposed to be amended, with reasons for amendment.

1. The full name and address of the person on whose behalf the application is made, and the extent and character of the interest in the property, together any portion of the site on which the building is proposed to be erected forms part of a disused burial ground, and whether the property is freehold, leasehold, or copyhold, must be stated. Particulars must be furnished as to the nature of the application and the situation of the street, building or structure, and the purpose for which such building is required.

Formation and laying out of new streets—Adaptation of ways for streets and widenings of streets, etc., section 7 and section 10 of the 1894 Act.

2. Each street must be marked on the plans with a number, and referred to in the application as Street No. 1, Street No. 2, etc.

In the event of the application being sanctioned, two additional copies of the plans will be required, and the intended name of each street, identified by reference to the number of the street on the plans, must be submitted in accordance with section 32 of the Act of 1894.

[NOTE.—Having regard to the time limit of one month imposed by the Act, in which objections must be made to names submitted for streets, it has been decided to require applicants to defer formally submitting names for approval until the Council has sanctioned the formation of the streets. The alteration is made with a view to identifying the streets for which the names are intended.]

Buildings (a) within the prescribed distance, (b) in advance of the general line of buildings, etc., section 13, section 17, and section 22 of the 1894 Act, and sections 3 and 4 of the 1895 Act.

3. Plans must be to a scale of 22 ft. to the inch, and must show the situation of the building in relation to others adjacent, to a sufficient extent to show the frontage of either side of the street. The height and precise distance from the centre of the roadway of the proposed building and the width of the street are to be figured.

In the case of applications under section 13 (5), the extent and height of the old buildings on the site must be shown to the same scale, and a copy of the plans certified by the district surveyor, together with the originals, should be forwarded to the original certifier, and will be returned after being compared with the copy.

Recesses and openings in external walls and recesses in party walls, section 54 of the 1894 Act.

4. Plans of the floors of the building and an elevation of the wall in which the recesses or openings occur to a scale of one-eighth of an inch to the foot. The sizes of the recesses and openings must be figured.

Additional cubical extent, section 76; and buildings for the supply of electricity, section 203 of the 1894 Act.

5. The use to which the various parts of the building are intended to be put is to be indicated, also the positions and numbers of any hydrants or other fire-extinguishing appliances proposed to be provided, and any points bearing upon the question of liability to fire.

Naming of streets and numbering of houses—Part IV. of the 1894 Act.

6. In numbering houses the rules to be observed are as follows:—St. Paul's Cathedral is recognised as a central point; and the numbering of houses begins at the end or entrance of the street nearest that building, except where a street leads from a main thoroughfare to a less important street, and then the numbering starts from the main thoroughfare. Taking, therefore, the sides of a street as left and right (assuming that the back is towards St. Paul's) the odd numbers will be assigned to the left-hand side and the even numbers to the right-hand side.

Under section 36 of the Act, the Council has the power to order "that any houses or buildings in any street or way or any part thereof shall for the purpose of distinguishing the same be marked with such numbers as they shall deem convenient for that purpose." Great inconvenience and expense in renumbering would frequently be saved if the above rules were observed in the first instance.

7. No name is to be used for a street unless with the approval of the Council previously given. It should be a name consisting of one word or a few words, without the addition of "street," "road," "other like term."

[NOTE.—This alteration is necessitated by practice of the Council to approve the use of similar names (e.g., "Aldwych," "Kingsway," etc.) streets.]

8. Only such thoroughfares as may be deemed to be of sufficient length or importance may be designated roads.

The Council will be prepared favourably to consider the use of the terms "avenue" and "grove" conditionally upon the planting and maintenance of suitable trees in the streets in question; other descriptions, such as "gardens," "crescent," "square," etc., may be used only when the term seems appropriate.

[NOTE.—These alterations are made in order that the Council may have a wider discretion in allowing the use of such terms as "road," "avenue," which they seem appropriate.]

9. The name should be one that is not already in use within the county; it should, if possible, be some way associated with the locality.

The Council's list of streets and places in Administrative County of London, together with office list of available names, arranged under districts for which they are appropriate, may be consulted by applicants.

10. Applicants proposing names for large blocks of artisans' dwellings, mansions, manor-houses, etc., should have regard to the rules which apply to the naming of streets.

The Council should be notified of every name proposed to be used as a postal address.

[NOTE.—This alteration is made with a view to controlling, so far as may be possible, nomenclature of large blocks of buildings.]

Any person or persons setting up any name to be used within the county, or the expiration of any name after notice of the intention to set up the name has been given to the Council, or setting up any name objected to by the Council under section 32 of the Act, shall be liable to a penalty of 40*s.*, with continuing penalty of 40*s.* for every day on which the offence continues after conviction.

[NOTE.—This new paragraph is inserted for the purpose of drawing attention to the illegality of setting up names for streets other than those approved by the Council.]

Conditions upon which applications may be granted—Standing orders as proposed to be amended.

11. No building shall be commenced or erected upon either side of such roadway, or a site adjoining upon such roadway, unless a roadway shall have been and shall still remain defined and thrown open as aforesaid, and unless such roadway shall have been and shall still remain so made as regards levels, direction, width, and gradients throughout as to comply with the provisions of any statutes and by-laws in force in London regulating streets and buildings, and unless such roadway shall also have been so made as to comply with the provisions of any regulations made under the Act of 1894.

Sections attached to the application for the sanction of the Council, and unless the name of the street has been approved by the Council, and an approval shall have been affixed and shall be retained at both ends of the street.

[NOTE.—This alteration, to the need for which attention has been drawn by the solicitor, is made in order to ensure the approval of the Council to the suggested name is obtained, and that the name actually approved is affixed and retained.]

Naming and numbering of streets—Part IV. of the 1894 Act.

Names submitted for new streets are to be communicated to the local authority in whose district the streets are situated, with a request that they will inform the Council within fourteen days of their observations which they may desire to make thereon.

[NOTE.—New paragraph to give official sanction to the present practice.]

12. After the making of an order for the renaming of any street, an intimation thereof is to be sent to the Post Office authorities, and the superintendent registrars of births and deaths for the districts in which the streets are situated.

A notification of names approved for new streets, and of orders made by the Council for the renaming of streets and the renumbering of houses, also to be sent to the proprietors of Kelly's directories.

[NOTE.—New paragraph to give official sanction to the present practice.]

13. After the proposed alterations in the standing orders as to notice of a new name for a street (No. 7 in the table), the Historical Records and Buildings Committee considered it desirable that power should be delegated to them by the Council to enable them to make formal objections on behalf of the Council, under section 32 of the London Building Act, 1894, to any name intended to be given to a street. Section 32 of the Act is as follows:—"Before any name is given to any street, notice of the intended name shall be given to the Council, and the Council may by notice in writing set up any name to any street in London, until the expiration of one month after notice thereof has been given as aforesaid to the Council or to some other person named in the notice, if any name objected to as aforesaid."

It will be seen that the period within which the Council has power to object under this section is limited to one month. This period has in practice been understood, proved to be altogether insufficient, and in the great majority of cases, owing to the time occupied in bringing applications before the Committee and the Council, the time limit elapsed before the notice of objection could be given. The Council in the Committee's suggestion and have proposed a definite order of reference accordingly so as to provide that the Local Government Records and Museums Committee, who have taken over these duties since the reconstitution of the Committee in March, 1904, shall exercise the power

the Council under the section in question. We comment—

(a) That the regulations, rules, and standing orders under the London Building Act, 1894, and the London Building Act, 1894 (Amendment) Act, 1898, adopted by the Council on July 16, 1899, be rescinded.

(b) That by-laws, rules, regulations, and standing orders under the London Building Act, 1894, and the London Building Act, 1894 (Amendment) Act, 1898, set out in the appendix to the report of the General Purposes Committee, dated October 24 and 31, 1904, be made.

(c) That an addition to the order of reference to the Local Government Records and Museums Committee be made as follows:—The Committee shall exercise the powers of the Council under section 32 of the London Building Act, 1894.

The appendix and standing orders follow. The amendments were agreed to.—Ed.]

The Building Act Committee brought up a following report, the consideration of which, however, was adjourned until next week:

LONDON BUILDING ACTS AMENDMENT.

The Council on June 14, 1904, on the recommendation of the Building Act Committee, instructed the General Purposes Committee to prepare a Bill for introduction into Parliament in the session of 1905 to amend the provisions of the London Building Acts. It may be well to briefly indicate the steps which led up to this decision. The Council on November 4, 1892, resolved to introduce into Parliament a Bill to amend the provisions of the London Building Act, 1894, relating to safety from fire. Subsequently on March 3, 1893, the Council, on the recommendation of the Parliamentary Committee on the London Building Act, 1894, and Parliamentary Committees with a view to their advising the Council, after consultation with such persons and authorities as might be desirable, as to the ultimate form the Bill should assume. The Bill referred to dealt only with the question of safety from fire, and left untouched many other questions with regard to which the London Building Acts had been made, and to need amendment, and as the Council had decided that this Bill should not be proceeded with, the Session of 1893, we felt strongly that any Bill should include all the amendments and provisions required in the London Building Acts. It is not, however, found practicable for three Commissions to prepare the material for a Bill of this character, and the Council, on May 25, 1902, on the recommendation of the Commissions concerned, rescinded the resolution referring it to those Commissions, on the understanding that the Building Act Committee should proceed with the preparation of proposals for introducing all the amendments required in the London Building Acts. We accordingly devoted much time and attention to this task, in connection therewith, we have considered the proposals made by the Fire Brigade, Highway Improvements, Local Government, Main Drainage, Public Control, and Public Health Commissions of the Council, by the majority of the Metropolitan Councils, and by the Royal Institute of British Architects, the Institution of Civil Engineers, the Surveyors' Institution, the District Surveyors' Association, and many other bodies. We have also considered all the cases illustrating the defects pointed in the London Building Acts, as been dealt by the Building Act Committee since 1894, in addition, the by-laws and Acts in force in the principal provincial towns, and the by-laws in force in the principal districts of London, have been studied with a view to extracting any provisions therefrom of value in London. As the result, we have obtained valuable material for the amendment of the London Building Acts. On June 14, 1904, we submitted a report to the Council indicating the terms of the object of our proposals, and stating that we would submit details at a later date. We have now fully completed our proposals, and are in a position to recommend them to the Council. The greater number of our suggested amendments were communicated to the Parliamentary Committee on the 13, 1904, to enable the preparation of the Bill to be proceeded with, and the remaining suggestions have since been communicated. The draft Bill, embodying nearly all the suggestions put forward, is furnished to us at our request by the Parliamentary Committee immediately after the conclusion of the summer recess. We have completed our consideration of the draft Bill, and have submitted our observations thereon to the Parliamentary Committee. It therefore appears to us that, although the Bill is not perfect, the objection to the Bill is necessarily very great, there is no objection to the Bill introduced in the next Session of Parliament. The Council approves of the principles of the proposed amendments. We may remind the Council that the Bill of 1894 was introduced by the Hon. Secretary, who, in August, 1902, wrote the Council stating that, in view of the facts disclosed at the inquest on the Queen Victoria-street, he thought the Bill should be introduced in the next Session on the subject of safety from fire in high buildings required early consideration that, in his opinion, the matter could not be adequately dealt with by a mere extension of the powers of the Council under the Factory and Workshops Act, 1901, and he was therefore disposed to think that any legislation should take the form of an amendment of the London Building Act, 1894; that, as the Bill was a local Act, the amendment of its provisions would naturally be by a private Bill introduced by the Council, and that he would be glad to assist in any proposal that might be made in that respect, and that if it might be possible for him to do so, the Hon. Secretary subsequently informed the Council that he would have no objection to the extension to existing buildings of the clauses with respect to means of escape from fire, under proper conditions, and in certain cases, provided adequate provision were made for allowing the owners or occupiers of

existing buildings an appeal to an arbitrator or to some other tribunal. Our present proposals, which extend over the whole of the London Building Act, embody those contained in the 1903 Bill, with considerable modifications, which we have made with a view to meeting, as far as was reasonable, the criticisms which have been made. Before submitting details of the proposals it may be well to very briefly outline the more important amendments suggested by us:—

Outline of the most important proposed amendments.

Formation and widening of streets.—To give the Council greater powers with regard to the formation of new streets and the adaptation of ways to streets, with particular reference to restricting, except under certain conditions, the height of dwelling-houses erected in narrow ways and streets, and the height of buildings, erected on the site of previously existing buildings, within a certain distance from the centre of the roadway.

Building line.—To enable the Council to determine the future building line in any street, so as to facilitate the gradual widening of congested thoroughfares, and to make new streets, where necessary, to continue such widened thoroughfares, or to afford through communication.

Open space about, and lighting and ventilation of, buildings.—To increase the amount of open space required for new dwelling-houses; to improve the lighting and ventilation of habitable basements, and of rooms which derive light and ventilation only from a court within a building.

Means of escape in case of fire and reduction of risk of fire.—To require the provision of means of access to the roof in every building of more than one story, and exceeding 20 ft. in height; to reduce the height above ground level of the provision of means of escape can be required in the case of certain new high buildings, and, after a certain date, the application of similar provisions to certain existing buildings; to provide for means of escape from certain new, and, after a specified date, existing, buildings in which more than a certain number of persons are employed, or in which sleeping accommodation is provided for more than a certain number of persons; additional powers in regard to premises used in part for the purposes of trade or manufacture, and in part as dwelling-houses, especially where the part used for trade projects the frontage of the building (as, *e.g.*, in a grocery shop); to provide that consent shall not be given to the erection of a building to a greater height than 80 ft. unless the Council is satisfied that proper arrangements can be made and maintained for lessening danger from fire; powers to regulate the use of matched-board and panelling as an internal finishing to walls, etc., and the enclosing of lifts in buildings; and to protect in buildings of more than one storey class windows which are within 30 ft. of openings in other premises.

Construction of buildings.—To make certain amendments in the provisions of the Act relating to construction of buildings with a view to reducing risk of fire; to enable the Council to consent (a) to the cubical contents of buildings to be used for trade or manufacture, being of any dimensions that the Council may deem it expedient to permit (at present the Council cannot consent to buildings of greater dimensions than 450,000 cubic ft.); (b) to the uniting of buildings under proper conditions (at present buildings may not be united except where they are wholly in one occupation or are constructed or adapted to be so); and to make rules with regard to the use of iron and steel construction in buildings.

Buildings on low-lying land.—To strengthen the provisions of the Act relating to the erection of buildings on low-lying land.

District surveyors.—To amend the powers of the Council with regard to district surveyors so as to enable the Council to introduce a proper system of payment by salaries instead of fees at any time it should see fit to do so, provision being made for the continuation of any district surveyors engaged in consequence of the introduction of such a system; also to amend the fees payable in certain cases to district surveyors.

By-laws.—To enable the Council to make by-laws with regard to the demolition of buildings, the control of scaffolding and machinery, the use of iron and steel construction in buildings, and the erection of buildings on unsuitable sites.

Tribunal of Appeal.—To alter the constitution of the Tribunal of Appeal.

It is extremely difficult to give in a succinct form full details of every proposed amendment to an Act of such a technical character as the London Building Act, and we do not think the Council would desire us to attempt the task. The Parliamentary Committee have, however, informed us that they do not feel justified in proceeding with the introduction of the Bill until they shall have received detailed instructions as to procedure, and we therefore submit for the consideration of the Council the following particulars of our proposals:—

Details of proposed amendments to the London Building Acts.

Definitions.—To extend the application of certain expressions, and to define certain terms not at present defined.

Formation of streets.—To amend the provisions as to what constitutes a commencement to form or lay out, or adapt a way to, a street.

To enable the Council in the case of new streets or the adaptation of ways to streets:—

- (a) To require a greater width than at present; lateral communications; reservation of land to form street or formation of street for connexion with an adjoining estate; connexion with an existing street; protection of streets proposed to be formed on land at a different level to land immediately adjoining on either side.
- (b) To alter the position, direction, or level of any intended new street in order to make more direct communication.
- (c) To prevent the formation of *cuts-de-sac*.
- (d) To secure an equitable incidence of the cost of paving and making up streets.

To enable the Council to control the formation of back streets, and to require the formation of such streets where considered desirable.

Widening of streets.—To prohibit, except under certain conditions, the erection in ways laid out for foot traffic only of dwelling-houses of a greater height than the width of the way.

To enable the Council to require without payment of compensation a greater width than 20 ft. from centre of roadway where premises are to be used for business purposes.

To provide that in cases of rebuilding no increase in height over that of the previous building on the site shall be permitted unless the owner gives up to widen the road a strip of land of a width proportionate to the increased height of the building.

To prohibit the extension of any existing building within the prescribed distance without the consent of the Council.

To prohibit the erection without the consent of the Council of any dwelling-house within a distance of 20 ft. from the centre of the roadway to a height exceeding the distance of the front or nearest external wall of such building from the opposite side of such street. (At present this restriction applies only to "dwellings for the working classes.")

To make it clear that the existence of an irregular building or structure within the prescribed distance from the centre of the roadway does not confer a right to erect any building on the site thereof.

To require that certified plans of old buildings within the prescribed distance shall be made before demolition in cases where the owner demolishes the building, and that such plans shall show the extent and height and nature of construction of buildings or structures in their several parts.

General line of buildings.—To prohibit the extension or raising of any existing building, beyond the general line, without the consent of the Council.

To make the right to re-erect a building beyond the general line subject to plans being certified by the district surveyor, and to require such plans to be made before demolition in cases where the owner demolishes the building, and to show the extent and height and nature of construction of the old building or structure in its several parts.

To make further provision for securing the removal of buildings unlawfully erected in advance of the general line on the lines of the power now possessed by the Council with regard to prescribed distance.

To prohibit, without the consent of the Council, the erection of a building to the same line as that of a building previously sanctioned by the Council in advance of the general line, unless land, in a line with that required to be dedicated under the previous consent, be dedicated to the public use.

To enable the Council to control the line to which buildings may be erected where the general line has been destroyed by the demolition of buildings.

To make the Council the authority for giving the final permission for the erection of bridges and similar projections across public streets.

To provide that all retaining walls and buttresses of railways shall be set back to the general building line; and that in no case, except with the consent of the Council, shall there be less than 50 ft. in the clear between such walls or buttresses.

To make it clear that buildings erected under consents granted by the Council's predecessors shall not affect the general line.

Houses to define a building line.—To provide that the building line in any new street (not being within two miles of St. Paul's) shall not be nearer to the centre of the street than 35 ft. without the consent of the Council.

To enable the Council to define a building line on either or both sides of any important street or way, such building line not being at any point more than 75 ft. distant from the centre of the roadway of such street or way.

To provide that no building or structure shall without the consent of the Council be erected or placed either above or below the level of the highway adjoining the same beyond the building line defined by the Council.

To provide that the Council may upon payment of compensation require any building or structure projecting beyond the building line defined by the Council to be set back to such line, and that the Council may enter upon, take, and use the whole, or any part of any lands, buildings, or structures in advance of the line defined.

To provide that the land between the building line defined by the Council and the centre of the roadway shall, to such extent as the Council may by order declare, be deemed to have been dedicated by the owner thereof, and shall be left open for the use of the public and form part of the public way.

To provide that the Council may form, lay out, and construct any street as a continuation of any street or way, in respect of which the Council has power in force the powers of defining a building line for the purpose of affording through communication between different parts of the metropolis.

To provide for settlement of questions of compensation and for the necessary machinery for the Council to exercise the powers sought to be obtained.

Naming of streets and numbering of houses.—To enable the Council to give any name to, control the width of, and remove any way, street, or way, place, row of houses, or block of buildings.

To require the local authority and not the owner to set up the new name whenever the Council finds it to be necessary to change the name of any way, part of a street or way, place, row of houses, or block of buildings.

To require the occupier or owner to remove or obliterate any existing numbers or names abolished by the renumbering order.

To make various other minor and consequential amendments to facilitate the proper discharge of the Council's duties with respect to naming of streets and numbering of houses.

Open spaces about buildings, and lighting and ventilation of buildings.—To provide that factories, warehouses, etc., shall not be erected upon open spaces which are surrounded by dwelling-houses and upon which dwelling-houses would be prohibited on account of lack of air space.

To make better provision for the lighting and ventilation of habitable basements.

To require a certain amount of open space at rear to be provided to domestic buildings other than dwelling-houses at ground level in old streets when rebuilding.

To require provision of open space about all domestic buildings not abutting upon a street.

To provide for the maintenance of the open space provided in accordance with the Act.

To provide that open spaces behind houses shall be larger than the present Act requires.

To require that sufficient open space shall be provided to allow of the means of access to the inspection chamber required under the Public Health by-laws for the purpose of disconnecting the drain from the sewer being placed outside the building.

To require the space at the rear of all buildings used solely for dwelling purposes, in streets laid out before the commencement of the Act of 1894, to be provided at the level of the adjoining pavement.

To require that courts for providing light and air shall be provided in the centre or interior of new buildings exceeding 150 ft. in depth.

To amend the provisions relating to courts for admitting light and air to domestic buildings so as—

(a) To make a minimum provision for the ventilation to a court inclosed on every side.

(b) To make it clear that the window referred to in the provisions is intended to be a window provided to comply with the rules as to habitable rooms.

(c) To omit from section 45 of the Act of 1894 the provision that a court of which the greater dimension does not exceed twice the less dimension shall be held to comply with the section if a court of the same area, but square in shape, would comply therewith.

(d) To reduce the depth allowed for a court open on one side, and to make the rules as to windows to habitable rooms apply to any window to a habitable room, including a room in a basement.

(e) To limit the height of walls in which there are any windows, which are required to be provided by the rules as to habitable rooms, opposite to any land or building which is or is intended to be in a different occupation.

(f) To make the provisions relating to courts for admitting light and air to "domestic buildings" apply to offices and counting-houses.

(g) To make provision with regard to a window placed obliquely in a court or recessed.

Height of buildings.—To omit paragraphs 3 and 4 of section 47 of the Act of 1894, which provide that the prohibition against building to a greater height than 60 ft. shall not apply to the rebuilding to the same height as at present of any building existing at the passing of the Act of a greater height than 60 ft., or to the raising of certain existing buildings.

To provide that consents to the erection of buildings to a greater height than 60 ft. shall only be granted when proper arrangements can be made and maintained for lessening the danger from fire.

To provide that in new streets no building shall exceed in height the distance between buildings on opposite sides of the streets.

To make the provisions as to the height of buildings in streets of a less width than 50 ft. apply to streets formed before 1862 as well as to those formed subsequently.

To prohibit the erection and to control the height of buildings (other than domestic buildings) within a specified distance of buildings of the domestic class.

Means of escape in case of fire and reduction of risk of fire.—To provide that every building (both new and existing) of more than one story and exceeding 25 ft. in height shall be provided with means of access to the roof, and with a parapet or guard rail, where necessary to prevent persons slipping off the roof.

To alter the height above which stories have to be provided with means of escape in case of fire from 60 ft. to 50 ft., and to provide for the maintenance of the means of escape.

To require the provision and maintenance of means of escape from buildings (other than factories and workshops, coming within the provisions of the Factory and Workshops Act, 1901, common lodging-houses and dwelling-houses occupied by not more than one family) in which sleeping accommodation is provided for more than twenty persons or in which more than twenty persons are employed.

To enable the Council to revoke its certificate, if necessary, in the event of change of user or alteration of premises increasing the risk of fire or of failure to satisfactorily maintain the means of escape, provision being made for Council to attach conditions to its certificate and for the imposition of penalties for breach of such conditions.

To prescribe the method of constructing internal staircases provided as a means of escape. (The provision of an internal staircase as a means of escape will not necessarily be required; other means of escape may be adopted.)

To apply the above provisions to existing buildings after seven years; to provide for referring disputed matters to arbitration, for an equitable division of the cost of the alterations between the freeholders and leaseholders, and for requiring buildings already having the certificate of the Council under section 63 of the Act of 1894, and certificate was granted, to provide only such additional means of escape as may reasonably be required, having regard to the alteration of the limit of height from 60 ft. to 50 ft., and for the plans to be supplied to be only such (if any) as are necessary to show the additional risks.

To require owners to submit plans of new buildings before the erection of such buildings is commenced, and of existing buildings within three years from the passing of the Act and to provide for referring differences of opinion to arbitration.

To provide for the issuing of Orders by Petty Sessions Courts restricting the use of buildings or

portions of buildings from which it is impracticable to provide adequate means of escape.

To provide that in buildings exceeding ten squares in area and used partly for trade and partly as a dwelling-house:—

(a) The two portions shall be separated vertically and horizontally by, and all passages and staircases and other means of approach from the street to the part used as a dwelling-house shall be inclosed with, and constructed throughout of, fire-resisting materials other than wood. (Passages, staircases with access to the street, shall be provided, see paragraph (c))

(b) The passages, staircases, etc., referred to in paragraph (a) shall be of a prescribed width proportionate to the frontage of the premises.

(c) In cases where satisfactory means of escape are not provided from the sides, rear, or roof of the premises a staircase and, if necessary, a passage inclosed and constructed as described in paragraph (a) shall be provided to the street from the part used as a dwelling.

(d) No part of the premises shall be at a greater distance than 80 ft. from a satisfactory means of escape.

(e) Doorways in walls of staircases and passages referred to in paragraph (c) shall be fitted with doors of fire-resisting materials.

(f) The use of wooden joists in conjunction with concrete pugging shall be allowed for the construction of fire-resisting floors.

To prohibit the use as living-rooms or workshops of rooms above, or directly communicating with, oil-shops without (1) the provision of adequate safeguards to prevent the spread of fire from the oil-shops to other parts of the premises, and (2) the provision of means of ready escape from such premises.

To prohibit the division of one shop into two or more shops except in an approved manner by fire-resisting materials.

To require that in buildings used partly for shop purposes and partly for dwelling, where the shop portion projects more than 5 ft. beyond the main front of the building, the roof of the projecting portion shall be of a material of such fire-resisting means of escape are provided from the side, rear, or roof of the building, that a passage or passages inclosed in fire-resisting materials shall be provided from the street to the staircase or other approach to the part used for dwelling, etc. (the width and number of the passages being proportionate to the frontage of the building to the street) also to control the position and construction of lantern lights to the projecting portion, and to allow of ventilating cowls of satisfactory construction.

To provide—

(1) That separate sets of chambers or offices or rooms contained in one building—

(a) Shall not be deemed to be separate buildings, and that the district surveyor shall not be entitled to claim fee as such.

(b) Shall, if contained in a building exceeding 20 ft. in height and in an area less than one acre, be separated vertically and horizontally by fire-resisting materials other than wood.

(c) Shall also if contained in a building exceeding 25 squares in area have the floors of the lobbies, corridors, passages and landings, and the principal staircases of fire-resisting materials.

(2) That the principal staircases (in buildings with separate sets of chambers) shall be inclosed with incombustible material not less than 4 in. thick, or, if in brickwork, not less than 4 in. thick, and that the doors leading on to the staircase shall be fire-resisting, or, if of deal, solid and not less than 2 in. thick, and that all glazing, if any, shall be fire-resisting.

(3) That no building containing separate sets of chambers or offices, etc., shall, without the consent of the Council, extend to more than 50 squares in area.

To provide that no doorway to or from a staircase, corridor, or passage-way in certain new public buildings shall be less than the width required in the Act for such staircases, etc.; also that all exit doors and barriers having fastenings shall, if fastened during the time the building is in use, be fastened during such time by automatic bolts only, so as to open by pressure from the inside, and to provide that the requirements as to bolts shall apply to existing churches and chapels.

To provide that every lift, shaft, (except those in dwelling-houses) and hoist, (except those in a family) shall be constructed and inclosed to the satisfaction of the district surveyor in a prescribed manner, and that lift shafts reaching to the top of the building shall be protected in a prescribed manner with thin glass protected on the outside with strong wire guards, and those not reaching to the top or bottom, or in the case may be, with fire-resisting materials; also that the doorways to the lift shafts shall be fitted with fire-resisting doors, and that these provisions shall apply to existing lifts after seven years.

To provide that boarding and panelling shall be so fixed as not to allow of any space between it and the wall, etc., to which it is fixed, and that it shall be a work within the provisions of section 145 of the Act of 1894.

To provide that all windows of new buildings of the warehouse class which are within 30 ft. of openings of other buildings shall be protected in a prescribed manner so as to limit the danger of fire spreading, but so as not to prevent the entrance of firemen to any story above the ground floor.

To prevent the spreading of fire from the upper part of walls separating buildings within a certain distance above the roof of the lower building.

To provide that all constructional ironwork in buildings shall be protected by being encased to the satisfaction of the district surveyor in concrete brickwork, terra-cotta, or metal lathing and plaster or cement not less than 2 in. in thickness.

To empower the Council to require the maintenance of proper arrangements for lessening danger of fire in buildings of large cubical extent.

To prevent the use of wooden joists pugged concrete as a fire-resisting material for the structure of the floor over any room or enclosure in which a furnace is fixed.

Construction of buildings.—To provide for regulate the use of iron and steel construction buildings.

To provide for an appeal to the superintendent architect against the decision of the district surveyor on certain points of construction.

To provide that when two external walls above the roof are constructed next such walls without parapets, such walls shall be carried up above the roof as though they were party walls.

To provide that not more than two stories shall be constructed in the roof of any building, but that provision shall not apply to any story below a of 30 ft. above the pavement, one side only of story forms part of the roof.

To require that all staircases shall be adequately lighted.

To make the minimum height of habitable room (not wholly or partly in the roof) 9 ft., instead of 8 ft. 6 in. as at present, and the height of habitable rooms (wholly or partly in the roof) 8 ft. 6 in. instead of 8 ft., as at present.

To provide that the minimum space that shall be left between the ground and the underside of floor joists shall be 6 in., and to require the provisions of openings for ventilation, the minimum of such openings to be 5 in. by 6 in.

To provide that a habitable room constructed as a stable, coach house, or harness-room communicating therewith, shall be separated horizontally vertically from the stable by a solid concrete wall, and that the wall shall be supported, and of a minimum thickness 6 in.

To provide that if a construction under the pavement, etc., other than an archway, is constructed of brick or stone it shall be done to the satisfaction of the district surveyor, but to exempt arches, constructed by the Council in streets from the rule of the district surveyor.

To provide that outside stairs or steps to a dwelling-house shall be protected with a balustrade or handrail, where necessary.

To provide that horizontal separation as an alternative to separation by party walls.

To enable the Council to control the formation of openings in external walls closely abutting on other buildings.

To require that windows at a height of over 2 ft. above the ground shall be constructed in such manner as to admit of their being cleaned from inside.

Temporary buildings and structures.—To make clear what structures may be licensed, and to provide for the licensing of certain temporary buildings.

To provide that expenses incurred in causing the Council to secure the removal, after a certain date, of existing irregular buildings, and to make certain minor amendments in the provisions with regard to temporary buildings and structures.

Dangerous and neglected structures.—To empower for the Council to immediately shored up, pull down dangerous structures in urgent cases.

To provide that expenses incurred in causing the Council to secure the removal, after a certain date, of existing irregular buildings, and to make certain minor amendments in the provisions with regard to temporary buildings and structures.

To provide that every roof of a new or existing building, and every balcony, etc., intended for use for affording seating or standing accommodation for a number of persons, shall be safely constructed and secured, and provided with suitable access to the roof.

To prohibit the attachment of ropes, etc., across streets to buildings unless with consent of the borough council.

To prescribe that the period during which structures erected upon the public way shall be permitted to remain be limited to one year, unless the Council consent to an extension of this period.

Dangerous businesses.—To prohibit the carrying on of dangerous business except under licence of the Council, and to enable the Council to impose conditions, and to charge a fee for such licence.

Low-lying land.—To make the provisions as to building on low-lying land apply to buildings erected on land which is so situated that the buildings cannot be efficiently drained at all times into the existing sewerage system of the Council.

District surveyors.—To make various detail amendments to facilitate action by the district surveyor for breaches of the Act.

To give the Council power to proceed, should it desire to do so, in cases where it is the duty of the district surveyor to take action.

To make the necessary amendments in the Council powers with regard to district surveyors to enable them to introduce a proper system of payment of district surveyors by salaries.

To make certain modifications in the fees payable to district surveyors.

Tribunal of Appeal.—To increase the number of members from three to five.

To provide that one member (who shall not be a member of the Council) shall be appointed by the Council, that one shall be a barrister of not less than ten years' standing, shall be chosen by other four, and shall act as chairman of the Tribunal.

To provide that no architect or surveyor practising in London shall be eligible for membership of Tribunal.

To restrict the powers of the Tribunal to the limitations of the section under which the appeal is made.

By-laws.—To enable the Council to make by-laws with regard to—

The erection of houses on excavated sites and sites which are damp and have been heavily manured.

The nuisance caused by dust arising from the demolition of buildings.

the use of steel and iron construction, scaffolding and machinery.
 the mode of naming streets and numbering houses.
 exemptions.—To remove or modify certain of the provisions in the Act of 1894, and to add such as may be necessary.

Sanctions.—To enable the Council to sanction the cubical contents of buildings to be used for shops, or manufactories, or for any purpose which the Council may deem it expedient to permit, being such dimensions as the Council may consider necessary.

To enable the Council to consent to the uniting of buildings under proper conditions, and to make alterations in the requirements for doors and openings in party walls.

To enable the Council to require the removal of line signs, and to regulate the construction of boards, frames, affixed to external walls of buildings for the purpose of advertisement.

To control flags, cranes, etc., which only project from buildings when actually in use.

To provide that posts at the entrance to narrow streets shall be hinged so as to allow of the passage of carriages, and to apply this provision to existing passages.

To extend the time within which the Council can proceed to twelve months.

To provide machinery for enforcing the Act on unoccupied buildings when exempted from rates.

To provide that notice shall be given to the high council of intended building operations, and that the borough council shall be entitled to inspect plans of the works.

To provide that where an old building is taken down or destroyed for more than half its cubical contents, the remaining portion of the building shall be demolished or made in all respects to conform to the provisions of the Act.

To transfer to the borough councils the powers, duties, and liabilities of the district surveyors as regards the supervision of the construction and erection of the electric lighting boxes and similar structures under the public way, except in regard to property of Government and municipal authorities.

To make it an offence to use for more than three consecutive days or nights, or more than three single nights, in any one calendar month any building as a public place, or any building which has not been constructed in accordance with the provisions of the Act as to public buildings.

To prohibit the continuous employment of persons in rooms or basements not constructed in accordance with the rules of the Act as to habitable rooms or basements.

To prevent the use of a building for any purpose which would render it, while so used, not in conformity with the Act.

To provide that buildings which have been erected for one purpose shall not be used for any other purpose, unless, and until, the sanction of the Council is obtained.

To render void old "consents" and "orders" not in force upon the expiration of two years from the date of the Act.

To empower the Council to direct surveyors to cause the removal of improper building materials from a site, and to prevent the use of such materials in the erection of a building on such site.

To provide for the appointment of practical surveyors of all plans, machinery, and scaffolding in connexion with the erection of buildings, and to enable the Council to control such plans, machinery, and scaffolding.

To empower the Council to require the fencing of unoccupied land.

To provide power to secure the removal of any obstructions, obstructing communication between streets.

To require the sides of excavations to be properly and sufficiently shored up as the work is proceeded with.

To make additional provisions with regard to the use of timber.

To prevent any interference with the foundations of buildings after construction in such way as to alter the building.

To provide that for domestic buildings external walls may be constructed as hollow walls if such be constructed in accordance with certain rules, rates to be specified.

To make provisions for the construction of retaining walls and boundary fence walls and party fences exceeding 7 ft. to height.

To make it clear that in cases where the external or ground wall of a building is set back from the defined distance from the centre of the street, or where the Council has consented to the erection of a line upon condition that the land in front shall be given up to the public, the land separating the building from the public way is to form part of the public way.

To provide that the local authorities shall take care to make up roads and have snowsweeps within a reasonable time of the formation of the roads.

To provide power for local authorities to alter the level of the footway, and to prevent the obstruction of footways left open, but not dedicated to public.

To provide for registration at the Land Registry of covenants containing clauses as to giving up to the public.

To obtain power to prevent the erection of irregular structures, signboards, etc., on forecourts.

To revise the schedule of fire-resisting materials.

To make any amendments consequent on the foregoing proposals and certain other amendments of law, which have been sent to the Parliamentary Committee, but have not been specifically referred to.

To make an efficient amendment of the London Building Act in a matter which admits of no delay.

To provide that the vacant spaces remaining are being made up to the public, and the land separating the building from the public way is to form part of the public way.

rear of buildings insisted upon. The subjoined table, which has been compiled from the information given in the Council's statistical abstract as to the number of houses rated and from the annual reports of the Building Act Committee, shows approximately the rapidly with which building is proceeding, and, unfortunately, future slums are in many cases being created—

NUMBER OF HOUSES ERECTED AND TOTAL LENGTH OF STREETS SANCTIONED DURING THE YEARS 1897-8 TO 1902-3.

	1897-8	1898-9	1899-1900	1900-1	1901-2	1902-3
Approximate number of houses erected	4,774	3,507	5,287	The figures for this year are not comparable owing to the London Government Act, 1899, coming into force.		2,401
Length of streets sanctioned (in miles)	14	17	23	16½	9½	15½
	Houses.		Streets (in miles).			
Total	21,436		95½			
Average (per annum)	3,573		16			

RECOMMENDATIONS.

We recommend that in the Bill to amend the London Building Acts, which the Council, on June 14, 1904, resolved should be introduced into Parliament in the session of 1905, provision be made—

(1) To enable the Council in the case of new streets and adaptations of ways to streets—

- (a) To require greater width, lateral communications, connexions with existing streets, reservation of land for connexions to adjoining estates and the formation of such connexions when required; protection of streets proposed to be laid out at a level different from that of the land immediately adjoining on either side.
- (b) To alter the position, direction, or level in order to make more direct communication.
- (c) To prevent the formation of *cuis de sac*.
- (d) To secure an equitable incidence of the cost of paving and making up.
- (e) To control and require, where necessary, the formation of back streets.

(2) To facilitate the widening of existing streets by—

- (a) Restricting, except under certain conditions, the height to which dwelling-houses may be erected in narrow streets and ways.
- (b) Enabling the Council to keep back, without compensation, to a greater distance than 20 ft. from the centre of the roadway, buildings to be used for business purposes.
- (c) Restricting, except under certain conditions, the height to which any buildings within 20 ft. from the centre of a street or way, etc., may be re-erected, and prohibiting the raising or extension of any such building without the consent of the Council.

(3) To strengthen the powers of the Council with regard to the erection and re-erection of buildings in advance of the general line of buildings; to enable the Council to control the line to which buildings may be erected where the general line has been destroyed by the demolition of buildings; and to provide that the building line in certain new streets shall not be within a certain distance of the centre of the street.

(4) To enable the Council to determine a building line on one or both sides of any important street at a distance not exceeding 75 ft. from the centre of the street; to acquire any buildings, land, or structures in advance of the line so determined, or to require any such buildings or structures to be set back to such line on payment of compensation; to provide that after the determination by the Council of such a building line no building or structure shall, without the consent of the Council, be erected or extended in advance thereof; to enable the Council to make new streets where necessary to continue a thoroughfare widened as aforesaid, or for the purpose of affording through communication, and to provide for the settlement of questions of compensation and for the necessary machinery to enable the Council to exercise the powers sought to be obtained.

(5) For certain amendments in the provisions relating to the naming of streets and numbering of houses in order to facilitate the discharge of the Council's duties with regard thereto.

(6) (a) To enable the Council to require the provision of space at rear in certain cases where it cannot now require it, and increased space at the rear of dwelling-houses, and to prevent the erection of buildings which are not subject to the provisions as to space at rear on sites which are surrounded by dwelling-houses, and upon which the erection of dwelling-houses would be prohibited for lack of air space.

(b) For requirements as to open space with regard to all domestic buildings not abutting upon a street.

(c) For the maintenance at all times of the open space provided in accordance with the Act.

(d) For the better lighting and ventilation of habitable basements and of rooms which have no windows directly opening on to the external air otherwise than into a court inclosed on every side or open on one side only.

(7) For means of escape in case of fire and reducing risk of fire by requiring all buildings (new and old) exceeding a certain height to be provided with means of access to the roof (guard rails being provided where necessary) by reducing the height above which means of escape can be required in new buildings, and applying the amended provisions to existing buildings after seven years; by requiring means of escape to be provided from new buildings in which there is sleeping accommodation for more than a certain number of persons, or in which more than a

certain number of persons are employed (the provision to extend to existing buildings after seven years); by making provisions as to the construction of buildings containing sets of offices or chambers, and the size to which such buildings may be constructed; by requiring proper preparation to be provided between the two portions of premises used partly for trade and partly as dwellings where such

premises exceed a certain size, and the provision of means of escape (special provision being made in the case where the shop portion projects more than 5 ft.); to prescribe rules for boarding and panning and the construction of new lift shafts (except in certain dwelling-houses), the rules to apply to existing lifts after seven years.

(8) To enable the Council to consent to the uniting of buildings under proper conditions, and to the erection of buildings of such cubical extent as the Council may deem it expedient to permit, and to permit and make regulations for the use of iron and steel construction in buildings.

(9) For certain amendments in the provisions of the Act relating to the rights of building and adjoining owners.

(10) For wooden buildings of certain dimensions being licensed by the Metropolitan Borough Councils, and for enabling the Council to secure after a certain date the removal of existing irregular buildings.

(11) For certain amendments in the powers of the Council with regard to dangerous and neglected structures.

(12) To prohibit the carrying on of dangerous businesses except under licence from the Council, and to enable the Council to impose conditions, and to charge a fee for such licence.

(13) To make the provisions as to building on low-lying land apply to buildings used or to be used wholly or in part as dwelling-houses erected on land which is so situated that the buildings cannot be efficiently drained at all times by gravitation into an existing sewer of the Council.

(14) For increasing the number of members of the Tribunal of Appeal from three to five, for one member to be appointed by the Council, but not to be a barrister of not less than ten years standing, to be chosen by the other four, and to act as chairman of the Tribunal; also that no architect or surveyor practising in London shall be eligible for membership of the Tribunal, and that the powers of the Tribunal shall be restricted to the limitations of the section under which the appeal is made.

(15) For the necessary amendments in the Council's powers with regard to district surveyors, to enable it to introduce a proper system of payment of district surveyors by salaries, and to make certain modifications in the fees payable to district surveyors.

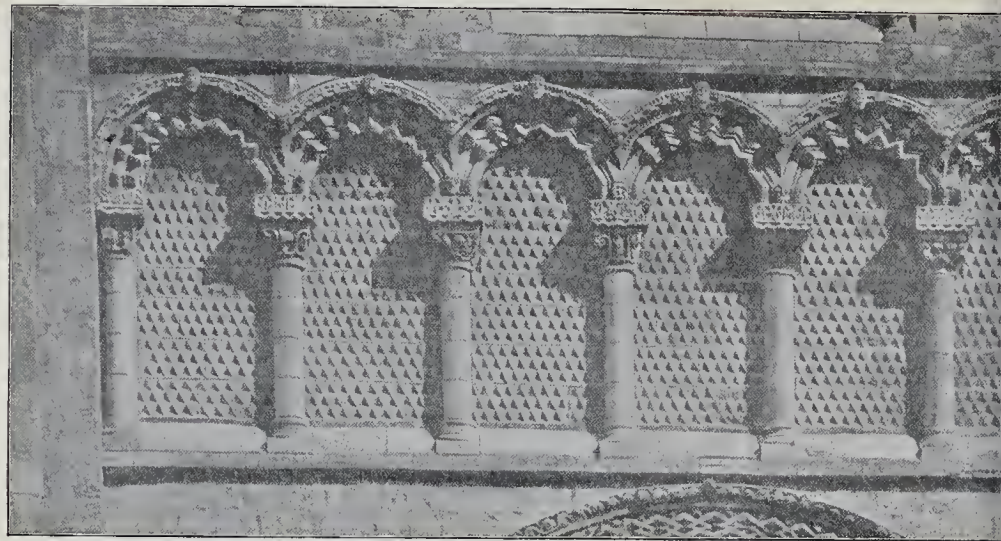
(16) For repealing, modifying, or adding to certain of the provisions in the Act of 1894, giving total or partial exemptions from the provisions of the Act.

(17) For the other amendments indicated in the foregoing report, but not specifically included in the foregoing clauses of the recommendation.

Notice has been given by Dr. Naper of the following amendment to recommendation No. 1 (to be recorded by Mr. Shephard):—

"That, whilst fully recognising the necessity of amending, at an early date, the London Building Acts in many important particulars, the Council is of opinion that, having regard to the number and magnitude of the proposed amendments, to the fact that they have not been submitted to and considered by the professional and local authorities (in accordance with the practice hitherto adopted, and which the Building Act Committee in their report to the Council on June 14, 1904, implied would be done) and to the further fact that the proposals of the Council for legislation in the next session of Parliament are already both numerous and important, it is undesirable to proceed with the proposed amendment of the London Building Acts in the next session of Parliament; but that such proposals be referred back to the Building Act Committee for further consideration with a view to legislation being sought in the session of 1906."

ARCHITECTURAL PICTURE POSTCARDS.—Mr. H. R. Allenson sends us four packets of six picture postcards each, two consisting of views of "Wren's City Churches," two of them labelled "Old London Churches." Among the many subjects now used for picture postcards we are glad that architecture is not forgotten.



Arcading over West Doorway, Ouistreham.

Illustrations.

OUISTREHAM CHURCH.



WE give a view of the exterior of the fine Romanesque church of Ouistreham, a small seaside place on the north coast of France, some nine miles from Caen; and also separate illustrations of the west doorway, and of the arcading immediately over it.

The west end shows a very simple but effective decorative treatment by means of wall arcading; and though these are details differing considerably from those common in Norman architecture as transplanted to England, one may imagine the arcading of the west front to be a fair indication of what may have been the treatment of the space within the great arch of Tewkesbury front, before it was cut out to introduce the large late Gothic window.

There is nothing about it, indeed, comparable in boldness to the Tewkesbury arch, but the successive masses of the perfectly plain buttresses, seen in perspective in the view, have a very striking effect.

The church was to have been the subject of a special article in this issue, which had been duly written and posted but, by some accident, has not reached us.

PUBLIC OFFICES, HENDON.

This building has recently been erected on the north-west side of the Burroughs, Hendon.

The subjoined plan shows the principal floor.

On the ground floor the engineer's department and drawing-office occupy the south-east portion under the clerk's department, while the rate collector and accountant and the education clerk occupy the north-east portion, under part of the Council Chamber and Committee-room No. 2. The medical officer's department is situated under the members' library and Committee-room No. 1. The building inspector's office and materials testing-room are under the waiting-room, and in a one-story building projecting towards the north-west of the principal staircase. The caretaker's rooms are in the attics over the clerks' inquiry-office and spare room.

The facing bricks are new heather red-pressed bricks, supplied by the Heather Brick & Terra Cotta Company, Ashby-de-la-Zouch, Leicestershire; while Beerstone is used for the window dressings, entrance, etc. Permanent green slates are used in the roofs; the roof of the ventilating lantern is covered with copper and finished with a wrought-iron vane.

The contractors were Messrs. Thomas H. Kingler & Son, Oxford. The heating arrangements were carried out by Messrs.

C. N. Haden & Sons, Cromer-street, W.C. The architect is Mr. T. H. Watson, and the drawing was exhibited at the last Royal Academy.

DECORATIVE DESIGNS FOR TEXTILES.

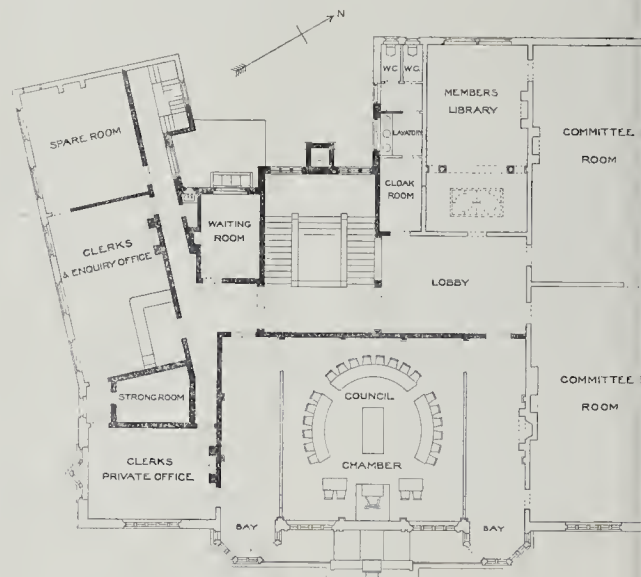
THESE four designs are by Mr. A. B. McDonald, a student at the Royal College of Art.

Of the two upper ones, that on the left-hand side is for a printed silk, having seven colours on a white ground; to be reproduced by block printing. That on the right is also for a printed silk, but for roller printing, in four colours on a white ground.

The left-hand lower design is for a chintz, acid printed on an indigo cloth; then five other prints, leaving long leaves, stems, and flowers

partially white: roller printed. That on the right is a chintz in six prints; cones and flowers on a white ground: block printed.

POST OFFICE BUILDINGS, AUCHTERARDE.—The new Auchterarder post office will have a frontage to High-street of 42 ft. It is three stories in height, the ground floor being utilised for the post office and a shop; the other two stories for a dwelling. There will be an entrance at the back for receiving and despatch of mails. The building will have a saloon at the back, and a dwelling-house will consist of eight apartments, with bathroom, etc. The plans have been prepared by Mr. James Macdonald, architect, Perth, and the whole work was carried out under his supervision.



PLAN OF PRINCIPAL FLOOR

Public Offices, Hendon.



W. PHOTOGRAPHIC CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

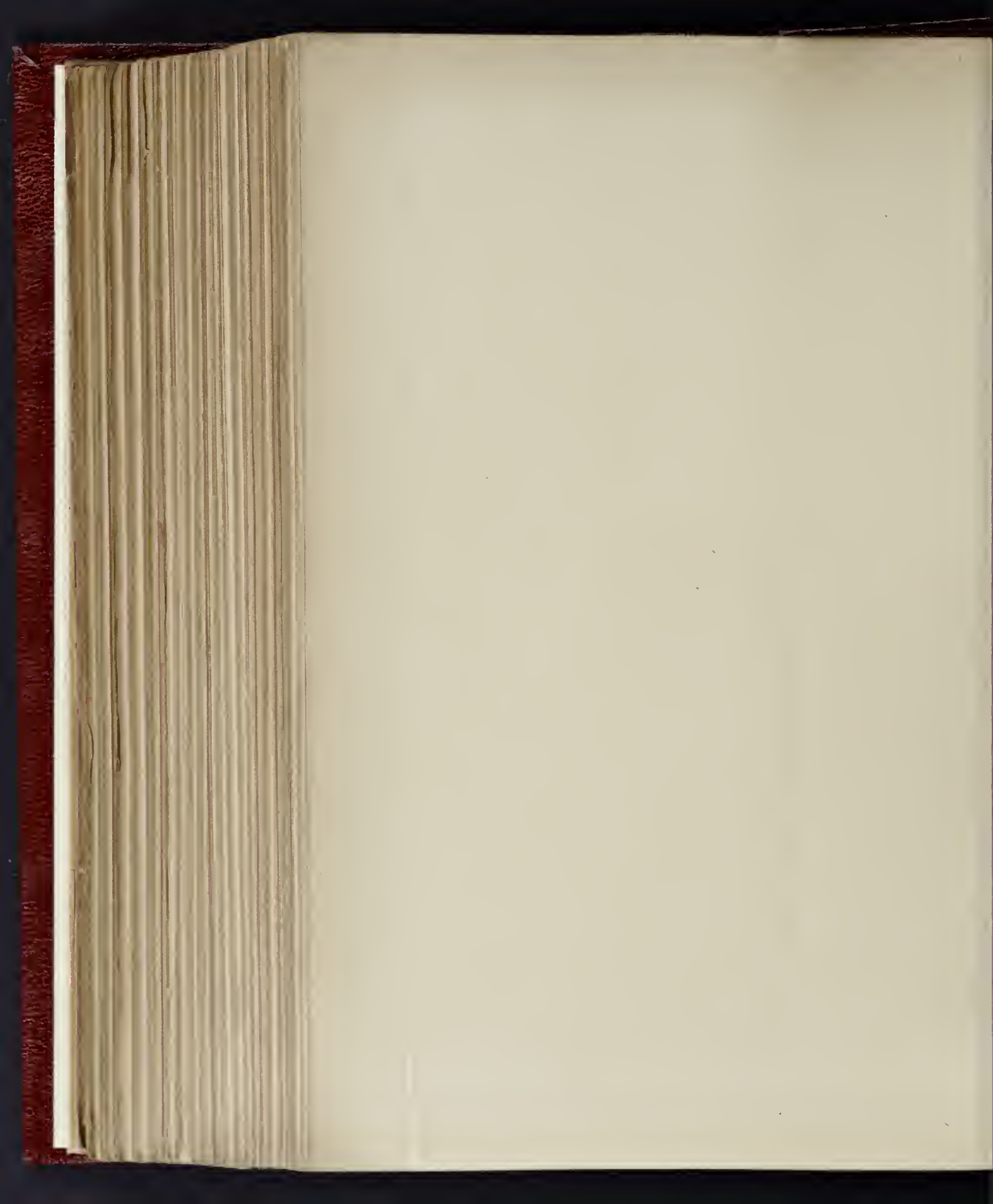
OUSTREHAM VIEW FROM WEST END





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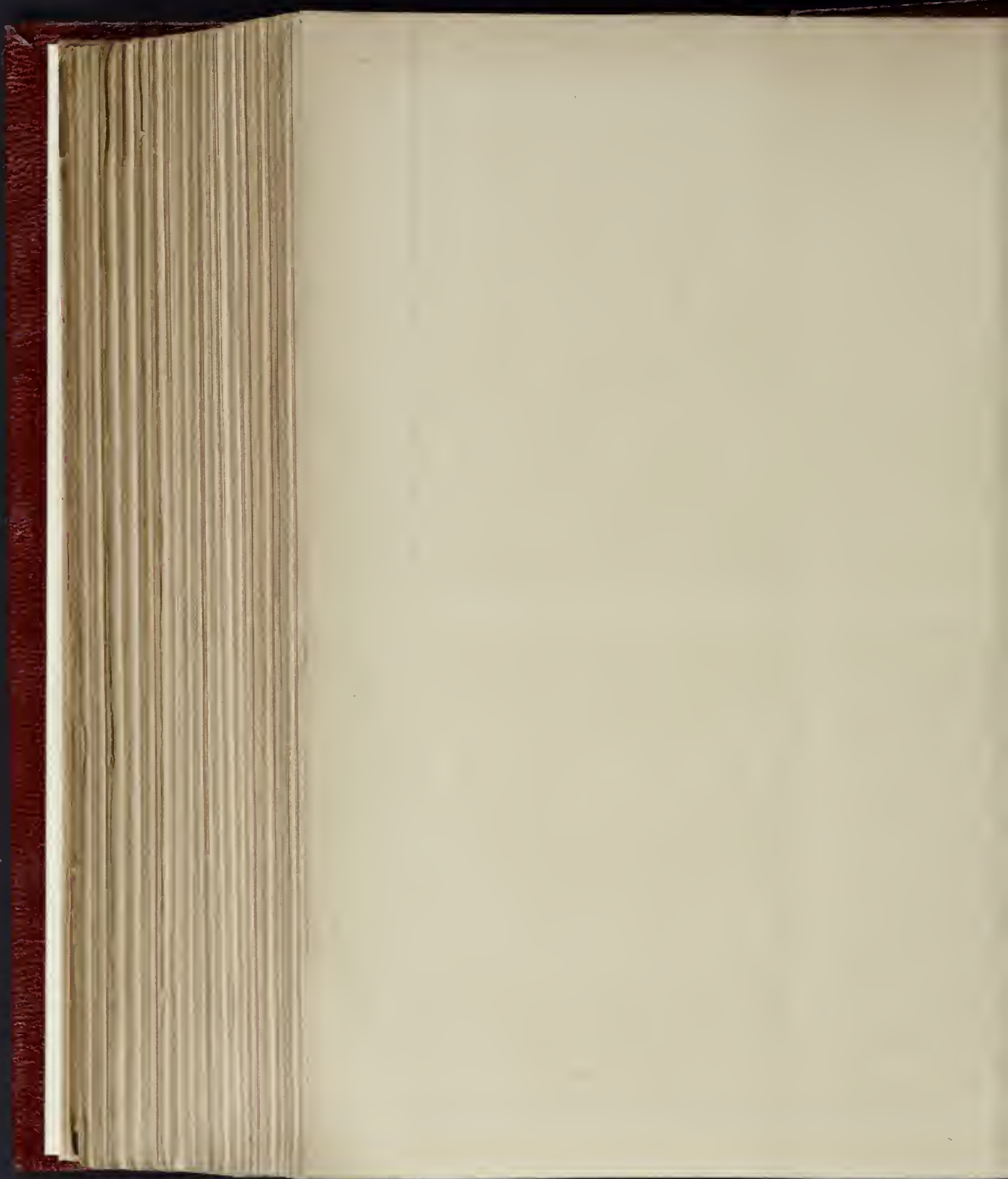
WEST DOORWAY, OUISTREHAM



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DESIGNS FOR TEXTILES - BY MR. A. B. McDONALD (ROYAL COLLEGE OF ART)



NEW FLOORING METHODS AT BORDON CAMP.

As a generally applicable axiom, it may be taken that novelties are seldom, if ever, exemplified in the construction of buildings and other structures designed in the drawing offices of the various Government Departments, where old-established precedents reign supreme. Improvements can rarely enter until they come into universal favour in the outside world and have acquired respectability with time. Bearing in mind this peculiarity of official practice, we have additional pleasure in directing attention to two novel methods that are now being applied to floor construction at Bordon Camp, under the direction of Colonel Staveley Gordon, R.E., to whose courtesy we are indebted for the opportunity of obtaining the particulars given in this article.

The first of these systems is a type of concrete-slab floor construction of German origin, and which, so far as we are aware, has not been adopted elsewhere in this country. A floor of this system has just been completed by Messrs. Hawkins & Co., of Ashford, Middlesex, one of the barrack buildings at the Camp. The dimensions of the space covered being 10 ft. long by 22 ft. wide, and it is worthy of note that, although the floor is only 5 1/2 in. thick at the centre, no girders, joists, or intermediate supports are required. The concrete employed is mixed in the proportions of one part of Portland cement to four parts of ballast, and the reinforcement is applied to the tension area in the form of steel strips measuring 1 1/2 in. wide by 3/8 in. thick, the strips having quarter-twist at intervals, apparently with the object of obtaining a more secure bond between the concrete and the steel than would be given by using straight bars, and also for the purpose of affording ample support for the concrete along those parts of the bars which lie horizontally. To distribute this effect over the whole floor slab, the bars are twisted at regular intervals so that the horizontal portions of one bar may be opposite the vertical portions of adjacent bars. The bars are embedded at a suitable distance above the lower surface of the concrete, in order that the metal may be adequately protected against fire. The resistance of the floor is increased by adding to the thickness of the concrete near the walls, and in some cases round rods are used for reinforcement in addition to the flat bars. We are not present in a position to give the results of tests upon the floor, but may say that the calculated safe live load is stated to be 62 lb. per sq. ft. and the dead load, including the weight of the floor itself, 150 lb. per sq. ft., a factor of safety of 5. So far as first principles are concerned, there is nothing new in this system of flooring, the novelty being confined in the particular manner in which the reinforcement is employed. If accurately proportioned, any floor of the kind would be perfectly safe, and the facility it offers for forming comparatively large spaces without supporting ribs is a feature that will, no doubt, be appreciated by architects.

Another new method which has been extensively used at Bordon Camp is the "Stonwod" system. The materials of construction consist of a fine powder, produced in different ways, and a cementing liquid. As the composition of these materials is kept secret by the makers, we are only able to state the results of our recent examination, which extended over a course of being laid, to floors recently made, and to others that had been in use for several months. In the first place, we may say that the material can be laid as a covering on a concrete foundation, over a brick or stone floor, or upon any firmly-nailed wooden surface so as to form a perfectly jointless surface. After solidification—a process occupying about thirty hours—can be polished and oiled to a parquet floor. In contact with wood "Stonwod" adheres so firmly that it can easily be separated without bringing away any of the fibres, and it makes an equally satisfactory bond with concrete and other materials used for foundations. Some of the reasons that we had the opportunity of inspecting the construction were being laid with a "Stonwod" skirting, raised to the height of 2 or 3 in. all round the walls, to facilitate cleaning operations and to prevent any risk of leakage into the brickwork at the junction of the floor with the walls. One point that should always be borne in mind is to avoid any of the flooring until it has thoroughly

hardened, and for the same reason the work of laying should not be undertaken in a building before other workmen have concluded their labours. However, the only injury done by premature use is to scratch the surface, and this can readily be made good by rubbing and repolishing. In one building at Bordon, used alternatively as a gymnasium, a concert hall, and a church, the floor has been slightly scratched by the nailed boots of the soldiers. This represents the extent of the damage caused by several months of hard wear, and is attributed by the patentees to the fact that the floor was opened for use too soon after completion. A more favourable criterion for judgment is to be found in the floor of the sergeants' mess-room, where there are no perceptible signs of wear, although a wooden fillet in the doorway has been completely worn through by constant traffic. The same room permits the observer to test the different effects of the covering when applied to a foundation of concrete or of timber, the elasticity of the latter being very pronounced, as might be expected. It is claimed for "Stonwod" that its fire-resisting qualities are of a high order, but on this point we are unable to speak from personal experience. For the purpose of giving the maximum degree of security against fire, the covering ought certainly to be laid on concrete or some equally non-combustible material. It happens, however, that innumerable timber floors are in existence which the owners are not likely to replace by others of fire-resisting character. In such cases, "Stonwod" offers a ready and inexpensive means of securing protection from fire on the upper surface of the floor. It is warm to the feet, and very much resembles linoleum in appearance, as in its comparative noiselessness. We are certainly inclined to believe that a very considerable future exists for this material in connexion with the design and construction of public institutions of all kinds, as well as of factories, offices, buildings, and private dwellings, more especially as in many cases it will render the use of linoleum and kindred floor coverings quite unnecessary.

NOTES ON PERMANENT WAY FOR TRAMWAYS.

UNDER this title, Mr. A. N. Connett, M.Inst.C.E., read a paper on Thursday last week before the Tramways and Light Railways Association. The subject is engaging much attention at the present time, and, considering the large sums of money that are being expended all over the country in the installation and extension of municipal and other tramways, it is very desirable that full publicity should be given to the results of experience and observation. Taking up "rails" as the first item for discussion, the author found very little to say, alleging the very satisfactory reason that "one result of the Report of the Standardising Committee on tramway rails has been to cut out an immense amount of 'copy' in papers such as this." Consequently, he was able to devote ample time to the discussion of "joints," a detail of permanent way construction on which much thought has been expended, and, so far, without the absolute demonstration of an entirely satisfactory solution of the problem involved. It is certainly a most unfortunate circumstance that the life of rails is practically limited by the wear at the joints, and all true economists must feel grieved to know that miles of tramway rails have to be taken out and replaced every year simply because the metals are battered at the ends, although otherwise they have many years of wear in them. One serious difficulty experienced by the tramway engineer is, as stated by the author, "that the tram-joint is inaccessible for inspection and repairs." We have no doubt that if joints on tramways were sited so that they might have the same attention as on steam railways, the joint problem would be greatly simplified. Many varieties of mechanical joint have been tried, and of them the experienced engineer was said to believe that all "are bad, only some are worse than others." No doubt, this saying is an exaggeration, but the difficulties attending the employment of mechanical joints of all kinds have caused a good deal of attention to be paid to other methods. Among such, Mr. Connett dealt with cast weld, electric weld, and thermite weld joints. The first of these is satisfactory if made in the most careful manner by experienced men. Its disadvantages were said by the author to be

that the process of welding by using a large mass of molten metal changed the character of the steel rail ends, and that there was, in consequence, wear at the joints due to softer steel there than elsewhere. But the most serious objection is to be found in the large plant required, for, as the author remarked, "The transportation and use of a miniature blast furnace along a public road is a thing one would avoid if possible." The electric weld joint, at first a failure, was described as being in successful use although requiring a somewhat formidable plant. Of the thermite weld joint, which has previously been described in our columns, the author expressed a generally favourable opinion. We know that the results obtained at Leeds are satisfactory, and if they continue to be so in the future, this form of joint may become almost universal. In dealing with the question of "construction," Mr. Connett called attention to an interesting variation from the usual type of concrete construction. This system, adopted by Mr. A. E. White, M.Inst.C.E., city engineer of Hull, consists of a concrete foundation, between which and the rail is a cross-sawn Baltic redwood sleeper, 4 in. deep by 7 in. wide, the object of the timber being to provide some elasticity to the rail and, consequently, a more noiseless and more easy-running track. The paper concluded with some brief remarks upon paving, a subject on which very little need be said, as local conditions usually govern the adoption of the system that must be adopted.

BY-LAWS UNDER SECTION 39 (1) OF THE PUBLIC HEALTH (LONDON) ACT, 1891.

The Public Health Committee of the London County Council reported as follows at Tuesday's meeting of the Council, the recommendations being agreed to:—

On July 26, 1904, we reported further as to the necessity for an amendment of By-law No. 26, made by the Council under section 39 (1) of the Public Health (London) Act, 1891, and the Council, on our recommendation, gave instructions that copies of the by-laws proposed to give effect to the desired amendment should be again sent to the sanitary authorities pursuant to section 114 of the Act. This action was accordingly taken, and we have considered the further observations made by these authorities, but do not think it necessary to make any alterations in the amended draft. We recommend—
(a) That by-laws be made by the Council under section 39 (1) of the Public Health (London) Act, 1891, in the form set out in the appendix to this report, and that the seal of the Council be affixed to copies of such by-laws.
(b) That notice be advertised of the Council's intention to apply to the Local Government Board for confirmation of the by-laws, and that the other action prescribed by sections 184 and 185 of the Public Health Act, 1875, be taken.

By-laws made by the London County Council under section 39 (1) of the Public Health (London) Act, 1891, with respect to water-closets, earth-closets, privies, and receptacles for dung.

1.—The occupier of any premises shall cause every water-closet belonging to such premises to be thoroughly cleansed from time to time as often as may be necessary for the purpose of keeping such water-closet in a cleanly condition.

The occupier of any premises shall ensure that in every week cause every receptacle for dung belonging to such premises to be emptied and thoroughly cleansed. Provided that where two or more lodgers in a lodging-house are entitled to the use in common of any water-closet, or receptacle for dung, the landlord shall cause such water-closet to be cleaned, or receptacle for dung to be emptied and cleansed as aforesaid.

The owner of any lodging-house shall, subject to the provision hereinafter provided, give and maintain in connexion with such house, water-closet, earth-closet, or privy accommodation in the proportion of not less than one water-closet, earth-closet, or privy for every twelve inmates of such house.

Provided that proceedings shall not be taken against the owner of any lodging-house for an offence against the last-mentioned requirement of this by-law unless and until the owner, after service upon him of a notice in writing by the sanitary authority, requiring him within such reasonable time as is specified in the notice to comply with the by-law, has failed to comply with the by-law within the time so specified.

For the purposes of this by-law, a "lodging-house" means a house or part of a house which is let in lodgings or occupied by members of more than one family. "Landlord" in relation to a house or part of a house which is let in lodgings, or occupied by members of more than one family, means the person (whatever may be the nature or extent of his interest) by whom or on whose behalf such house or part of a house is let in lodgings or for occupation by members of more than one family, or who for the time being receives or is entitled to receive the profits arising from such letting. "Lodger," in relation to a house or part of a house which is let in lodgings or occupied by members of more

than one family, means a person to whom any room or rooms in such house or part of house may have been let as a lodging or for his use or occupation.

Nothing in this by-law shall extend to any common lodging-house.

Penalties.

2.—Every person who shall offend against the foregoing by-law shall be liable for every such offence to a penalty of five pounds, and in the case of a continuing offence to a further penalty of forty shillings for each day after written notice of the offence from the sanitary authority.

Provided, nevertheless, that the court before whom any complaint may be made or any proceedings may be taken in respect of any such offence may, if they think fit, adjudge the payment as a penalty of any sum less than the full amount of the penalty imposed by this by-law.

Repeal of By-law.

3.—From and after the date of the confirmation of these by-laws, the by-law numbered 26 (twenty-six) in the by-laws relating to water-closets, earth-closets, privies, ash-pits, cesspools, and receptacles for dung, and the proper accessories thereof in connection with buildings, which were made by the London County Council on the twenty-second day of June, in the year one thousand eight hundred and ninety-three, and were confirmed by the Local Government Board on the twenty-eighth day of June, in the year one thousand eight hundred and ninety-three, shall be repealed.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, M.P., Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Bermondsey Borough Council 13,400*l.* for erection of working-class dwellings; Hammersmith Borough Council 6,690*l.* for street improvements; Hampstead Borough Council 900*l.* for office accommodation; Poplar and Stepney Sick Asylum District Managers 5,005*l.* for works at asylum; and Shoreditch Borough Council 925*l.* for pipe sewer re-construction works. Sanction was also given to Islington Borough Council to borrowing 3,950*l.* for asphalt paving works; and to Woolwich Borough Council to borrowing 330*l.* for advances under the Small Dwellings Acquisition Act, 1899.

The London Building Act.—Proposals by the General Purposes Committee and the Building Act Committee are printed on another page.

Avery-hill Mansion.—The Education Committee and the Parks Committee, each submitted a report dealing with the proposal to use the mansion at Avery-hill, formerly the residence of the late Colonel North, for the purpose of a training college for teachers. The park in which the house is situated was acquired by the Council in 1902 as an open space, and the Parks Committee recommended that Parliamentary powers be sought to authorise the use of the mansion and two acres of adjacent ground as a residential training college for teachers.

Sir W. J. Collins, on behalf of the Education Committee, moved an amendment to the effect that, instead of two acres of land, four acres of land should be utilised for college purposes.

After a long debate, the amendment was carried by 72 to 44 votes, and agreed to as the substantive motion.

Selected List of Contractors.—The following recommendations of the Education Committee were agreed to:

"That the names of the undermentioned firms be removed from the selected list of contractors to tender for works in connexion with L.C.C. schools:—(i.) Messrs. Couchman, Blow & Co., of Blackheath; (ii.) Mr. C. Humphrey, of Fulham; (iii.) Mr. E. Harmer, of Brixton; and (iv.) Mr. C. Foreman, of Plumstead.

That the name of Mr. John Peattie, of No. 18, Dorset-street, Baker-street, be added to the selected list of contractors to be invited to tender for carrying out structural alterations and repairs to school buildings to the value of 3,000*l.*"

Survey of Non-Provided Schools.—The Education Committee reported that:—

"The Council, on June 28, 1904, sanctioned expenditure not exceeding 1,794*l.* for making a survey of the 508 non-provided schools within the county, beginning with those schools which have been unfavourably reported upon by the Council's inspectors. Active steps are being taken to complete this survey and the form upon which the reports are being made by the architect (educational) provides for a description of the arrangements existing in regard to (i.) lighting, (ii.) ventilation, (iii.) heating, (iv.) cloak accommodation, (v.) lavatory accommodation, (vi.) teachers' rooms, (vii.) staircase accommodation and emergency exits, (viii.) area of playground. Particulars are also given of the office accommodation and the general condition of the building as regards structural repair, etc., together with the recommendations of the architect (educational), upon the various points. Up to the present time about 200 schools have been surveyed, and the architect (educational) reports that his survey will be completed by February, 1905. Following this paragraph will be found detailed recommendations dealing with the undermentioned twenty-nine schools:—

Battersea—St. Mary's (N.), Green-lane, Battersea.

Battersea—Christ Church (N.), Este-road, Battersea. Battersea—The Sacred Heart (R.C.), Trotter-street, Battersea.

Battersea—St. Peter's (N.), Plough-road, Clapham Junction.

Battersea—Wesleyan Model (Southlands Training College Practising School), Castle-street, Battersea.

Battersea—St. John's (N.), Usk-road, Battersea.

Battersea—St. Mark's (C.E. Infants'), Battersea-rise, Bethnal Green, W.—St. Matthias (N.), Granby-street, Bethnal Green.

Brixton—St. Andrew's (N.), Lingham-street, Stockwell.

Brixton—St. Mark's (N.), Bolton-street, Kenington.

Clapham—Wandsworth-road (Commercial), St. Paul's-place, Wandsworth-road.

Deptford—St. Joseph's (R.C.), High-street, Deptford.

Greenwich—St. Peter's (N.), Bridge-street, Greenwich.

Hampstead—Emmanuel (N.), West-end, Hampstead.

Hampstead—St. Mary's (C.E.), West-end-lane, Kilburn.

Hampstead—St. Mary's (R.C.), Holly-place, Hampstead.

Hampstead—St. Paul's (P.), Winchester-road.

Lambeth, N.—Lambeth-road (Wesleyan), Lambeth.

(19.) Lambeth, N.—St. Mary's (Infants'), Lambeth-road.

Marylebone, E.—St. Edward's Convent (R.C.), Blandford-square.

Marylebone, W.—Richmond-street (R.C.), Edgware-road, St. John's Wood.

Paddington, N.—Harrow-road (R.C.), Paddington.

Paddington, N.—St. Mary's (N.), Ch-reh-place, Harrow-road, Paddington-green.

Paddington, N.—St. Mary Magdalene, Charendon-street.

Poplar—Hale-street (Wesleyan), Poplar.

Poplar—All Saints' (N.), Bow-lane and Newby-place, Poplar.

Waltham—St. Matthew's (N.), Lion-street, New Kent-road.

Waltham—St. John's (N.), Larcum-street, Waltham-road.

Wandsworth—Immanuel (C.E.), Factory-square, Streatham-common.

Prefixes to the reports on each school are (i.) the official number of the school (Board of Education); (ii.) the late School Board division and sub-division; (iii.) the accommodation as recognised by existing managers (as far as such information is obtainable); (iv.) the accommodation as recognised by the late authority; (v.) the accommodation as recognised by the Board of Education; and (vi.) the accommodation now recommended to be recognised. In each case recommendations are submitted in reference to the character and suitability of the premises for purposes of elementary education. It should be added that, unless specially mentioned, there is a *prima facie* case that the drains are in a serviceable condition."

The report included reports from the educational architect (Mr. T. J. Bailey) on surveys he had made of the twenty-nine schools, recommending that in some cases representations should be made to the Board of Education as to the unsuitability of the schools from a structural point of view, and in other cases recommending substantial structural alterations.

Sir William Collins, the Chairman of the Education Committee, said he did not agree that this question of the state of the non-provided schools should be considered piecemeal, his contention being that these schools should be dealt with as a whole. He, therefore, declined to move the recommendation of the Committee.

The Rev. A. Jephson thereupon moved the recommendation dealing with the first school on the list, and stated that the managers of the non-provided schools were anxious to know their fate.

Mr. McKinnon Wood moved, as an amendment, that the recommendations be referred back to the Committee to complete their survey and inspection of all the non-provided schools as rapidly as possible, and to report to the Council, including as to the extra expenditure which would fall upon the rates before the close of the financial year. He said he could quite recognise that the managers were anxious to know their fate, and he could appreciate their anxiety, for they did not want this matter of the Voluntary Schools and Elementary Education to come before the people of London as one great picture.

After a discussion extending over three hours, during which it was stated that there are 508 of these schools to be reported on, the amendment was carried on a division by 72 votes to 45.

The Port of London.—The Rivers Committee presented their report, recommending that the Council should promote a Bill in the next session of Parliament, on the lines of the Bill introduced by the Government with certain modifications, for the purpose of establishing a Port Commission, which should purchase the undertakings of the three principal dock companies, take over the duties of the Thames Conservancy so far as they related to the Lower Thames, and carry out works for the improvement of the Port. The proposed Bill stipulates that the Commission shall consist of 40 members, 24 to be appointed by the Council and four by the City Corporation and Government

departments, the remaining 12 to be shipping representatives.

Sir T. Cooke-Hitching moved as an amendment:—"The having regard to the evidence before the Royal Commission to great effect if not insurmountable, difficulties connected with dredging the Thames, dredging is involved in the scheme for purchase of the docks and warehouses in Port of London, it is desirable before the Council commits itself to the principle purchase to refer back the report to the Committee, with instructions to take expert opinion on the question of the practicability of dredging the river by means of dredging, or alternative plan of obtaining permanent water by means of the erection of a bar with ship locks at Gravesend."

Mr. J. Brandon seconded the amendment. Mr. Bruce declared that a barrage would destroy the Port of London. If they stop the scour of the Thames, the sandbanks at Gravesend would flatten out and fill up existing channel.

The amendment was rejected. An amendment moved by Mr. Harris to effect that the representation of the Council on the Commission should be 15 and no members was also rejected.

Lord Welby, on behalf of the Finance Committee, moved the addition to the recommendation of words to authorise the Commission to levy dues on goods in accordance with schedule of *maximum* rates to be approved by the Board of Trade, provided that power was only to be exercised by the Commission in the event of the revenue of Port Fund being insufficient, after provision for working expenses and any prior charge to meet the interest on the guaranteed stock and the instalments payable to sinking fund for redemption of the stock which became payable.

Mr. Bruce seconded the amendment, which after some discussion, was rejected by a majority.

The recommendations of the Commission were then adopted.

Lewisham Palace of Varieties.—The Theatrical and Music-Halls Committee reported that they had considered plans submitted by Messrs. Owen & Ward, for Mr. W. Stephens, of a music hall proposed to be erected at the junction of Lewisham High-street and Limes-grove. The building will have seating accommodation for 1,642 persons. The application was agreed to on certain conditions.

Vauxhall Bridge—Designs for Panels.—Bridges Committee reported as follows:—

"The design approved by the Council on May 19, for the superstructure of the new Vauxhall Bridge, provides for sculptured panels over each of the piers, both the up-stream and down-stream sides. I estimate approved on that date, a sum of 1,000*l.* included in respect of each of the eight panels. The contract for the erection of the superstructure of the bridge. We have since had under consideration the question of the design of the panels, and have had the advantage of the assistance of Mr. A. Drury, A. Pomeroy on this feature of the elevation of the bridge. The original estimate of 8,000*l.* was in respect of iron panels with allegorical figures in low relief, but it is advised that, at an additional expenditure of 1,600*l.*, it will be possible to cast the figures in bronze. Sketch models have been submitted, and from them we have had an opportunity of judging the effect of different panels in colour and low relief. It appears to us to be so greatly superior to the latter that we have unanimously decided to adopt the proposed design. It will involve an increase of expenditure of 1,600*l.*, as above stated, a saving of a much-sum has been effected on other parts of the design of the bridge, so that the ultimate cost of the bridge will not be increased. We have given directions that the sketch models to be placed in the lobby of the Chamber."

Application under the 1874 Building Act.—That the application of Mr. E. Crosse for extension of the period within which the erection of a one-story cart-shed and stable, at No. 2, Bermondsey-wall, Rotherhithe, was recommended, be granted.—Agreed.

Fire Protection.—The following applications of the Fire Brigade Committee were agreed to:—"That the estimate (No. 4,250) of 4,000*l.* submitted by the Finance Committee in respect of the acquisition of three sites for additional fire-stations at B. Brookley, and Earlsfield (Wandsworth) be approved; and that the Fire Brigade Committee be authorised to make preliminary arrangements for the acquisition of such sites."

"That the estimate (No. 4,301) of 12,000*l.* submitted by the Finance Committee in respect of the acquisition of a site, and the erection thereon of a fire-station in substitution for the Shooter's Hill site be approved; and that the Fire Brigade Committee be authorised to make the necessary preliminary arrangements for the erection of the new station."

"That the solicitor do serve notices to

acquisition of the vacant site at the junction of Walsby-lane and Eaglesfield-road.

at the freehold of a piece of ground at the junction of Walsby-lane and Eaglesfield-road be acquired for £500; that the value do issue a draft contract, in addition to that amount, the usual surveyor's fee of 5s. 6d. for solicitor's preliminary costs; that the fee for do issue the matter; and that the seal of the Council be affixed to any necessary documents connected with the purchase.

at the freehold of Nos. 45, 47, 49, and 51, Calverley-bay, Upper Holloway, be acquired for 1,350; that the value do issue a draft contract, in addition to that amount, 21s. for a surveyor's fee and 4s. for the solicitor's preliminary costs; that the solicitor do issue the matter; and that the seal of the Council be affixed to any necessary documents connected with the purchase.

tramways.—The Highways Committee recommended, and it was agreed:—

(a) That the operation of standing order No. 363 relating to the time for the submission to the Council of schemes involving application to Parliament be amended, in order that the following recommendation be considered:—

That Parliamentary powers be sought, in the Session 1905, to enable the Council to construct tramways the boundary of the county of London in Church-lane, Upper Norwood, the site of the Crystal Palace, to a point nearly opposite the high-level to the Crystal Palace.

housing.—The Housing of the Working Classes Committee reported as follows, the recommendation being agreed to:—

We report that, in pursuance of the authority given to the Council on July 14, 1903, working drawings have been prepared of the buildings proposed to be erected on the site of the Royal Caledonian Asylum in Caledonia-road, Islington. The site, which will in future be known as the Caledonian estate, was acquired by the Council under Part III. of the Housing of the Working Classes Act, 1890, and has an area of about 2 acres, a frontage of 248 ft. to the east side of Caledonia-road, immediately north of Pentonville Prison. It is divided into the estate into five blocks of five-story dwellings, capable of accommodating 1,388 persons in tenements of one room, 110 tenements of two rooms, 144 tenements of three rooms, four tenements of four rooms, and four tenements of five rooms. The Housing of the Working Classes Committee have informed us that they are not prepared to undertake the erection of the buildings at the amount of the estimate, and we are of opinion, therefore, that tenders for the work should be invited from a selected number of firms. It is not desirable that the estimate of the cost should be published at the present time, and, as no liability will be incurred in making the estimate, we do not propose to submit an estimate of the cost of the buildings. We recommend:—(a) That the working drawings of the dwellings proposed to be erected on the Caledonian estate, Holloway, Islington, be approved; and that the Housing of the Working Classes Committee be authorised to invite tenders from a number of selected firms for the erection of the buildings.

the Gladstone Memorial.—The Improvement Committee submitted a report with recommendations to the allocation of a site for the proposed Gladstone Memorial. They recommended that the Memorial Committee be allocated a site to the west of St. Clement Danes Church in the Strand. The First Commissioner of Works has consented to the erection of the monument on this site. The monument will be of appropriate and important in character, and will, in the opinion of the Memorial Committee, be in every way worthy of the surroundings. It is designed by Mr. Hamo Thornycroft, R.A., and has a cruciform base measuring 26 ft. every way, with a pavement level at about 5 ft. wide. The superficial of the ground required for the structure will be about 500 ft. It is proposed that the memorial shall have an architectural base of sandstone, and shall be surmounted in the centre by a bronze statue of Mr. Gladstone. The robes of the Chancellor of the Exchequer, and statues or groups also in bronze will be placed on the projecting portions of the base, the height of the memorial will be about 100 ft. The proposed site, including the curving footway, is distant about 82 ft. from the buildings on the south side of the Strand, 51 ft. from the railings at the western end of St. Clement Danes Church, about 83 ft. from the north side of the Strand, and 139 ft. from the eastern end of the crescent site. This gives a width of about 60 ft. for the carriage-way to the south of the memorial, 46 ft. to the north, and 87 ft. to the west. The recommendation was agreed to.

being transacted other business, the meeting adjourned after a six hours' sitting.

ENT OFFICE.—An open competitive examination for not fewer than twenty situations of assistant examiner in the Patent Office will be held by the Civil Service Commission in January next. The examination will commence on the 2nd of the month, and applications for admission to it are ready for issue, and may be obtained on request addressed by letter to the Secretary, Civil Service Commission, Burlington-gardens, London, W.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The second meeting of the session was held at 18, Tufton-street, on the 2nd inst., when Mr. A. H. Belcher read a paper entitled "Economies of Construction in Small Houses," the paper being illustrated by an interesting collection of drawings lent by Messrs. E. Guy Dawber, John Belcher, Arnold Mitchell, Needham Wilson, Curtis Green, and other gentlemen. Mr. Belcher divided his paper under heads as follows: 1. Site; 2. Aspect; 3. Special requirements; 4. Size and number of rooms; 5. Plan; 6. Elevation; 7. Materials; 8. Sanitary arrangements and drains; 9. Decoration; 10. Cost; and 11. Builders. Taking these in the order enumerated, he laid stress upon the following points: The selection, if possible, of a fairly level site to avoid expense in foundation work. The advisability of a south or south-east aspect, careful attention to the special requirements, a matter often overlooked. As to the size and number of rooms, this depended on locality, in London the houses being often divided up into separate tenements containing three or four rooms, with either a separate water-closet, or one used in common with the other tenements, whilst in the country and suburbs of London houses contain as a rule about seven rooms, including the bath-room and water-closet. In regard to plan, Mr. Belcher said that economically the square type, with the flues taken up in one central stack was that best adapted, but this could not always be followed, as, for example, in a row of terrace houses. As to the question of elevation, one could lay down no hard and fast rule, but simplicity should be the key-note, and local material made use of as fully as possible. Mr. Belcher then proceeded to "trounce" the speculative builder, and to illustrate his remarks, banded round some sketches made by himself of modern jerry building. "Materials," the speaker regarded as perhaps the crux of the subject, and a difficult one to deal with, but much could be effected by a judicious use of materials to hand. Decoration he took as including painting and papering; for the former any plain colour and surface except imitation wood graining—personally he gave the preference to white throughout, varnished—and for the latter either a plain coloured living paper or common brown paper, but better still for the first six months is to distemper the walls. The most important thing with regard to sanitary arrangements was to concentrate these as much as possible, but District and County Council regulations had to be followed, and he ventured to think that some of the requirements were ridiculous, and capable of revision. As to cost, the price per foot cube in the examples shown on the screens varied from as low as 57d. at Hildote, to 10d. at Hollingbourne, the price depending on a good deal on locality. Lastly concerning builders, this was, he thought, a much more important matter than a good many architects considered, for often the small builder was a "one-trade man," and work entrusted entirely to him often suffered adversely in the trades other than his own speciality; he therefore suggested the employment of a builder of known capability at a slightly higher cost rather than the type alluded to.

Mr. Arnold Mitchell, in opening the discussion, alluded to the great trouble in preparing such a paper as they had had the pleasure of listening to, and expressed the thanks of those present to Mr. Belcher. The question of small houses was, he (Mr. Mitchell) thought, the most important of any to a young architect, as it was from the carrying-out of his first small house that the majority of them hoped to build up a successful practice. He advocated the most careful attention to small matters of detail, and illustrated his remarks by some practical suggestions touching the domestic blackbeetle (often a source of great annoyance in new houses), the more important being the careful setting of the range, the elimination of wood skirting, casing to hot-water pipes, and the construction of solid floors throughout. For the sake of economy he advocated building of kitchens for 4 ft. in height with reconds salt-glazed brick, the remainder being carried out in plain brickwork with stuck joints. To avoid unsightly markings where pipes passed through ceilings a good way, costing about 5d., was to have circular pieces of metal cut through which the pipe could pass, having about 2 in. of metal round to act as a shield, and to keep them in position by means of the screw-nut connexions

of pipes. He could not agree with Mr. Belcher that 100 ft. super was enough for living rooms, his experience being that 120 ft. super was the least people would put up with. He did not personally believe in "the parlour," which was only used in general on Sundays, or "when the district visitor called," but if a house was to let at all satisfactorily, one must be provided. His advice to young architects was, build the rooms as low as by-laws would permit (to his mind 7 ft. 3 in. was ample and over), and not worry as to fresh air. Regarding chimneys, he advocated the central type as affording an opportunity of making this a feature of the design. He ventured to disagree with Mr. Belcher as to his remarks anent painting and graining, and mentioned some small houses of Mr. Leonard Stokes', the doors of which were first painted a bright apple green, and then combed, the effect being most pleasing, and having the advantage of not showing markings in the same way as a plain surface.

Mr. Louis Ambler differed from the previous speaker in regard to the provision of a parlour, and also as to the height of rooms, nothing under 8 ft. being, in his estimation, enough. Wash-houses built inside the house were objectionable on account of steam, and he had adopted a method, in some houses he had recently built, of building the copper outside the house, and continuing the roof down so as to cover it. He believed it gave satisfaction. He was not altogether a great believer in baths for very small houses, as the misuse of them was very common, and he knew of a case where one had been used for keeping chickens in. Anything under 14 in. for thickness of outside walls on ground was pretty well impossible on account of damp, but 9 in. was, he thought, enough for walls above, though often by-laws were prohibitive. In answer to Mr. Belcher's interrogative he had used reed-thatch and found it required renewing every two to three years. If straw were used wire netting was imperative on account of the depredations of birds. As to floors, he believed in solid floors throughout, and personally he did not see the necessity of putting in joists as, if coke breeze were used, the boarding could be nailed direct to it. He did not like the idea of kitchen walls being built in ordinary brickwork unplastered, and, added in refutation of Mr. Belcher's statement, that he found there was no difference between casement and sash windows. In concluding, he declared himself an advocate for combing as against plain painting for doors, as being more serviceable.

Mr. W. A. Forsyth, in continuing the discussion, agreed with Mr. Mitchell as to the height of rooms, and mentioned the case of a district council accepting the underside of a stable loft flooring, as the ceiling line of the room under. A good thing was to lay common linoleum immediately on top of the ceiling joists and the ordinary floor boards above it, as it completely stopped any smell and noise getting through, and it could be painted or papered to form ceiling. He suggested a thin wash of cement over the surface of brickwork to overcome Mr. Ambler's objection. As a comment upon Mr. Belcher's preference for paneled doors, as these were generally understood to come from "the Baltic," he fancied they might not be quite so much in favour just at present. Concluding, he expressed the belief that the use of earth closets should be encouraged.

Mr. W. Trant Brown, in taking up the cudgels for the speculative builder, said that curiously enough he knew one of the houses sketched by Mr. Belcher to have been designed by an architect. He thought the mistake of the speculative builder lay in putting all in the elevation, and the reason why so much was the outcome of the small tenants' desire to make his cottage look as much like a castle as money would allow.

Mr. H. Passmore said he was struck by the expression of Mr. Mitchell's, that an architect should live to please; he thought "educate" would have been a better word. It was not much good discussing questions of height of rooms as that was a matter depending on local regulations. As a further example of the small details in thinking out a building, he wished to ask Mr. Mitchell how to prevent the presence of moths, as in a recently-furnished house they had been greatly troubled by a swarm of these insects. His experience of nailing boards direct to coke breeze was that, after a time, the boarding squeaked when

trodden upon. He personally believed in 9-in. walls, from practical experience.

Mr. J. H. Pearson, in taking up the case for the small tenant, thought, on the other hand, that he took the house not from choice but of necessity. He believed in 9-in. walls, and 4½-in. for scullery and washhouse if built in cement, and also in placing foul and exhaust gratings at the floor level.

The Chairman (Mr. H. Gregory Collins), before calling on the Special Visitor, regarded the general run of by-laws as excessive. He held the opinion that ground floor and other windows in modern work were, compared with old examples, much too large, and ventured to differ from Mr. Mitchell as to the method of building kitchen walls. He thought that the question of blackbeetles was rather like making a mountain out of a molehill.

Mr. Guy Dawber, in summing up the discussion, said he had anticipated a paper with a wider scope, but there was time enough for that at a subsequent date. The two most important matters were planning and economy in building and fitting up. In regard to the former, the simple and economical working of the house was of primary importance; loss of heat was obviated in great measure by adopting central stack and building external walls of flues with 9 in. of brickwork. Centralisation of heating and drainage matters was another most important point. Hot-water cylinders should be placed as near the kitchen range as possible, and, by adopting a system of double casing, room could be provided for airing mattresses. He held the opinion that 9-in. walls, except under special circumstances, were impossible. Mr. Dawber showed how, by using brickwork for sills and thresholds, considerable economy could be effected in actual building and subsequent upkeep; in fact, this latter was the point he most wished to emphasise, for, as he showed by quoting several other examples, by exercising ingenuity at the outset much unnecessary expense could be saved afterward for repairs and decoration. The substitution of plaster for wood linings to windows was an excellent example, and offered no difficulty in the matter of papering or painting. He believed strongly in the use of glazed brick and tilework as adding immensely to the cheerfulness and health of the occupiers, and it repaid its extra expense over plaster by the fact of never wanting painting. An excellent thing was to paint the skirting black and carry this across the bottom of doors, as was done in holland. He was in accord with Mr. Mitchell with regard to the non-casing of pipes, and suggested keeping them away at least 1½ in. from the wall by means of a clip or wood blocks; he also agreed as to the building of kitchen walls, but added that he believed in limewhitening them for sanitary reasons. In conclusion, he pointed out that by substituting plasterers' battening, plastered between, for wood boarding, a considerable saving could be effected on the roofs.

Mr. Belcher, in briefly replying, said that he did not object to combing doors, but to the system of disguising deal doors under coats of paint applied in imitation of a more expensive wood. He thought that walls of two half bricks with hollow space were quite sound from weathering and constructional points of view, and added, in answer to a query from Mr. Pearson, that 5 ft., in his opinion, was a good height for the slope of a roof to start from above bedroom or attic floor. As to heights of rooms, he said that if clients would agree to 7 ft. or 7 ft. 6 in. so much the better, but he fancied they would stand out more often for 8 ft. or 8 ft. 6 in.

The meeting then terminated with a hearty vote of thanks to Mr. Belcher and to the Special Visitor.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting held at the United Service Institution on the 7th inst., Mr. D. B. Butler, President, in the chair, a paper was read on "Recent Developments in Crushing and Concentrating Machines," by Mr. James Thame, and of which the following is an abstract:—In this paper the author dealt, firstly, with ore crushing machines; and, secondly, with ore concentrating machines from the earliest types to the latest improved forms, selecting for notice representative machines of the various classes. The problem to be solved was to mill ores at the lowest possible cost, and at the same time to crush them to the requisite degree of fineness so that

the after-process of extracting the metallic contents could also be carried out with the least expense. He then described the gravity stamp, which was the first and simplest form of crushing machine, and in Cornwall was more largely used than any other type of crushing machine. The pneumatic stamp mill consisted of a single stamp, weighing about 3 cwt., this mill being largely used in English tin mines and in the Transvaal. It had the advantage of great capacity and low first cost, but it required careful tending, and if any part broke the whole machine was thrown out—a great disadvantage as compared with the gravity stamp mill. Turning to rolls, the author observed that the Krom roll was probably the most generally used crushing machine of this type. In these rolls about 75 per cent. of the power used was employed in crushing, whilst the percentage of slimes produced was very low. The Huntington mill was the strongest competitor with stamps, and for the reduction of certain grades of gold and other ores it was a reliable machine. The Oliver mill was a combination of an impact and a grinding mill. Tube mills were next described. For many years past small machines of this type had been in use in England for re-grinding sand or tailings in mines, whilst an enlarged form was in use in Western Australia and South Africa for grinding partially crushed gold ore. His opinion was that tube mills bid fair to assume an important place in the future of ore crushing. Sectional or graded milling was now occupying attention, and it was not unlikely that in the near future the stamp mill would become a thing of the past. The standard system of milling of the future would probably be crushing by rock breakers and then by stamps, or by a mill to a one-eighth mesh, and then grinding to the final size in a tube mill.

ARCHITECTURAL SOCIETIES.

ULSTER SOCIETY OF ARCHITECTS.—A general meeting of this Society was held on the 31st ult. in the Society's rooms, Lombard-street. Mr. W. J. Gilliland, President, occupied the chair. Mr. W. J. Fennell proposed, and Mr. J. J. McDonnell, J.P., seconded, that the Council of the Society be instructed to take the necessary steps to obtain, if possible, the extension of the Arbitration Act of 1889 to Ireland. The Council of the Society submitted recommendations to the meeting that some explanatory clauses in the scale of architects' charges should be added, and some slight modifications should be made thereto to suit special circumstances. After discussion, the recommendations were adopted. The subject of the Belfast Corporation handing over to the staff of the City Surveyor important architectural works was discussed, and the view was very strongly expressed that the buildings so erected would suffer in architectural merit and convenience of arrangement without any corresponding advantage to the ratepayers, as such work carried out under the superintendence of an expert architect is likely to be more economically satisfactory than when he is not employed. It was decided that a deputation should wait on the Corporation at the quarterly meeting, and bring before it the views of the Society. The President reported that he had attended the meeting of the Registration Committee of the Royal Institute of British Architects in London on October 19, and that that meeting a sub-committee had been appointed, to which he was nominated, to report to the General Committee on the whole subject of the education, compulsory examination, and statutory qualification of architects. A meeting of this sub-committee was summoned for the 7th inst. in London, and that the whole subject was being considered with the greatest care, and, judging from the energy and enthusiasm exhibited in the promotion of a Bill to obtain statutory recognition, an Act of Parliament to secure same would be passed at no very distant date.—*Irish News.*

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The annual general meeting of the Leeds and Yorkshire Architectural Society was held on the 3rd inst. at the Society's rooms, in Park-street, under the presidency of Mr. G. B. Bulmer. It was announced that the Society had a total membership of 155, as compared with 152 last year. During the year three honorary members had been elected in Mr. R. H. Barran, M.P., Mr. W. D. Hollis, and Mr. E. C. Wallis. The officers for the year were elected at the

previous meeting. The balance-sheet showed a small balance in hand. The near drawings and architectural sketches sent for the students' competition were on view. Prize winners will be announced at the open meeting and smoker, at the Queen's Hotel November 17, when the presidential address will be delivered.

GLASGOW ARCHITECTURAL ASSOCIATION.—An ordinary general meeting of the Association held on November 2, Mr. James Duncan I heating engineer, Paisley, delivered a lecture on the "Reck" system of heating. Mr. Duncan claimed for the Reck system all the essential qualifications of a satisfactory heating apparatus. This system he defined as a circulator system of low pressure hot-water heating. Invented by Captain A. B. Reck, of Copenhagen, it was first used by him in Denmark eight years ago and was introduced into this country two years ago. The warming is done by hot water in a special manner by steam generated boiler working at a pressure of from 2½ lb. to 3 lb. The steam is applied in such a way that the circulation of the water is at least four times greater as in an ordinary hot-water system. The consequence of this increased velocity is possible to use piping one-fourth of the sizes, and the apparatus may be erected with consideration of levels. Further, there is no need that the boiler should be the lowest of the heating apparatus, and therefore heating chambers are not required. The application of the circulator to hot-water heating resulted in great efficiency at initial cost and expense in maintenance. The Reck system was now largely used throughout Europe, and Mr. Boyd described, with the aid of diagrams, several installations, illustrating the different methods used to suit the circumstances of each case.

COMPETITIONS.

PUBLIC LIBRARY, BENWELL, NORTHERN LAND.—The following is the result of competition:—First, premiated design, Vernon Hodge, 11, Grand-parade, Teddington; second and third, premiums added together, divided between Mr. C. Leslie Cox, Survey Department, Town Hall, Gosport, M. Davidson, Cratney, Central-buildings, Wake-on-Tyne, and Mr. C. H. T. Robinson, 27A, G. street, Wolverhampton.

WIGAN UNION OFFICES.—In a competition for new offices for the Guardians of the Wigan Union, limited to architects in the Wigan Union, the design submitted by Mr. H. Ogden has been accepted.

COADSEVEN BUILDING CLUB.—In the petition for the best designs for a pair of detached villas, to be sent in on the 12th ult. the Trustees have awarded the premium of one guinea to Mr. Basil C. Deacon, architect, Central-buildings, South John-street, pool.

BOOKS RECEIVED.

PRIVATE HOUSE ELECTRIC LIGHTING.—Frederic H. Taylor. (Percival Marshall Co. ls.)

Correspondence.

LIME ON BRICKS.

SIR,—I should be very much obliged if you could tell me how I can remove lime from a brick building caused by mixing against the bricks?—G. L. CRICKSHANK.

[*] The attached lime has no doubt been converted by atmospheric carbon dioxide into carbonate of lime, which is practically insoluble in water. If the bricks are probably the best method of removing lime would be to immerse the bricks in to which 1 per cent. of hydrochloric acid spirit of salts) had been added, until the dissolved, or until it could be readily rubbed off with the fingers. The bricks should then be immersed in running water for an hour to remove the acid. If they have already been laid and jointed mortar, this acid solution cannot be used as it would have a solvent action upon the carbonate of lime and the free lime mortar. Theoretically, a solution of caustic acid would be the best solvent for carbonate of lime attached to standing brickwork in practice it will probably be found that lime can only be removed by mechanical means.—ED.]

MINERAL OUTPUT FOR 1903.

In general report and statistics (of which the preliminary summary was issued a few days ago) relating to the output and value of minerals raised in the United Kingdom, amount and value of the metals produced, the exports and imports of minerals, for the year 1903, have now been published in detail, by authority of the Home Office, for presentation to both Houses of Parliament. It appears that the total value of the minerals raised amounted to 101,808,404*l.*, a decrease of 9,480*l.* as compared with 1902. This decrease is to be accounted for by the fall in average price of coal from 8*s.* 2*s.* 4*d.* per ton in 1902 to 7*s.* 7*s.* 3*d.* in 1903. The total output of coal was the highest hitherto recorded, 230,334,469 tons. The output of iron was 13,715,645 tons, showing an increase of 41 tons, though the value, 3,229,937*l.*, was less by 58,164*l.* than in 1902. The ore yielded 4,500,972 tons of iron, or about one-third of the total quantity of pig iron made in the country; 6,314,162 tons of iron ore were exported during the year, 73 per cent. of which came from Spain. As to the other metallic ores, copper, gold, lead, silver, and all showed an increase on the figures of both in amount and value of the metal mined, and in the case of tin, although the amount obtained was less, the value was higher. Subjoined is an extract of the particulars given in the report respecting certain of the mineral products:

Chalk.—A little chalk is raised from mines, but the total quantity is insignificant compared with the output of the open quarries; it is by far the most important chalk-yielding country, and many of its quarries produce more than 700,000 tons annually. Much of the chalk in Kent and Essex is employed in the manufacture of Portland cement at works on the banks of the Thames and the Medway. Total output in England in 1903 was 1,794,945 tons, value 132,527*l.*

China and Flint.—China is obtained principally from strata of carboniferous age in Yorkshire and Flintshire; both these counties supply the potteries with stones used for firing up the materials from which china is made. Flint is mainly obtained from the open pits. At Brandon, in Suffolk, there are a few shallow mines, worked in a most primitive fashion, which, with some small pits in France, suffice to supply the continually decreasing demand for the material. Total output in 1903 was 1,000,000 tons, value 15,036*l.*

Clay.—Many of the workings for clay and sand are less than 20 ft. deep, and so the operation of the Quarries Act, which returns are compulsory. It must, therefore, be understood that the figures given do not include the output of the shallow workings. There are a few counties in England which do not produce minerals employed in the manufacture of bricks, and the strata which they are dug belong to various geological ages. Beginning with the coal measures, we have mines and quarries producing fire-clay on a very extensive scale. Silurian strata are likewise largely worked, as well as various beds in the Triassic, Jurassic and Cretaceous rocks. The tertiary beds of the South of England afford much clay for making bricks, tiles, and pottery. The clay of Cornwall and Devon is derived from granite decomposed *in situ*. Surrey fuller's earth, which there occurs in the greensand. A like mineral is obtained in Wiltshire from beds of Jurassic age. Total output and value of clay in the United Kingdom for 1903, 16,198,021 tons, 1,767,981*l.*

Gravel and Sand.—Total yield in 1903, 1,757 tons, value 171,556*l.* These figures, however, must not be taken as representing total output, as these minerals are frequently dug from shallow pits less than 20 ft. which are not under the Quarries Act, which, consequently, furnish no returns to inspectors of mines.

Gypsum.—The principal gypsum deposits in the United Kingdom are those of Wiltshire, Nottinghamshire, and Staffordshire, where the mineral occurs in irregular beds, and in spheroidal and lenticular masses in the Keuper division of the Trias. The mines of Derbyshire and Westmoreland are in rocks of the same age, whilst the workings in Sussex is considered to belong to Purbeck beds. Total output in 1903, 97 tons, value 69,422*l.*

Igneous Rocks.—Under this head are included together various kinds of igneous rocks, such as granite, syenite, diorite, basalt, principally used for making road metal and paving stones. Leicestershire, with its quarries in Charnwood Forest, is by

far the greatest producer of granite rocks. Aberdeenshire and Cornwall are both remarkable for their granite, which is employed for building and monumental purposes. Carnarvonshire contributes important supplies of diorite, quartz-porphry, and argillite-porphry. Shropshire and Staffordshire have extensive basalt quarries at Clee Hill and Rowley Regis respectively. Warwickshire has a large output of diorite from quarries at Atherston and Nuneaton. Total output for the United Kingdom in 1903, 5,425,538 tons, value 1,508,054*l.*

Limestone (exclusive of chalk).—Limestone is very widely distributed throughout the United Kingdom; it is quarried in three-fourths of the counties in England, half the counties of Scotland, and in nearly every county of Wales and Ireland. Even without taking chalk into account, it is one of the most important minerals which is quarried in this country. Total yield in 1903, 12,222,911 tons, value 1,357,733*l.*

Ochre, Umber, etc.—Under this heading are placed the oxides of iron and manganese used as pigments, lubricants, etc. Some of the ochre of Anglesey is obtained from a native earth dug up from shallow pits, and a considerable amount is deposited by the ferruginous water from the copper precipitation pits, when exposed to the action of the atmosphere in shallow ponds. Total obtained in 1903 in the counties of Cornwall, Derby, Devon, Gloucester, Somerset, and Anglesey, 15,150 tons, value 17,045*l.*

Sandstone.—Under this heading are included all indurated sedimentary rocks which consisted originally of particles of siliceous sand, such as ordinary sandstone, grit, quartzite, "ganister," and also some "flagstone" and "freestone." They are obtained from strata of various geological ages, from the Cambrian period upwards. The counties of Lancaster, York, Glamorgan, Dumfriesshire, and Lanark are the chief producers. Total output in 1903, 5,409,502 tons, value 1,795,428*l.*

Slate and Slate Slabs.—North Wales furnishes most of the slate; speaking roughly, rather more than three-fourths of the Welsh slate was produced from open quarries, and nearly two-fifths from mines, that is to say true underground excavations. The two largest open workings are the Penrhyn quarry, near Bangor, and the Dinorwic quarry, near Carnarvon; the largest underground workings are those belonging to the Oakley Slate Quarries Company, Ltd., at Festiniog, with an output of 46,351 tons. Total yield of the United Kingdom in 1903, 531,612 tons, value 1,581,477*l.* These figures do not include argillaceous slate, nor the thin slabs which are sometimes split from certain limestones and sandstones for roofing purposes, and are known locally as "slate." These fissile stones are included under the headings "limestone" and "sandstone" respectively, as given above.

WESTMINSTER CITY COUNCIL.

The usual fortnightly meeting of this Council was held on Thursday last week at the City Hall, under the Chairmanship of Alderman Emden (the Mayor).

Expenditure of the Council.—The adjourned report of the Finance Committee dealing with the expenditure of the Council was again brought up. The report showed that the expenditure had increased by 37 per cent. over the figures for 1899-1900, and the Committee said it appeared to them to be clear that the cost of executing work by direct labour was considerably in excess of the cost under the contract system.

Mr. Everitt denied that direct labour was dearer than contract work, and said there were many works which could be done cheaper by the Council's own workmen.

Mr. Somers Coeks (Chairman of the Committee) said the Committee had no wish to enter into the controversy as to the cost of direct and contract labour. That was a matter of policy for the Council to decide. The duty of the Committee was merely to report the facts.

After considerable discussion the report was adopted.

Regency-street Dwellings.—The Housing Committee reported that the architect had returned the complete cost of the City of Westminster Dwellings, Regency-street, at 94,787*l.* 3*s.* 2*d.*, which was 21*s.* less than the sum authorised by the Council. The architects had made no charge for the troublesome negotiations with the owners of properties adjoining the dwellings in relation to the party walls and ancient lights surrounding the property. The architects' fees were 2,954*l.* 17*s.* 6*d.* The Committee recommended "That a letter, signed by the Mayor and countersigned by the Town Clerk, be forwarded to Messrs.

Joseph & Smithem, expressing the Council's thanks and satisfaction at the manner in which they, as the architects of the dwellings, have performed their professional duties."—This was agreed to.

Chandos-street Improvement.—It was reported by the Improvements Committee that a letter had been received from the London County Council with reference to the proposed widening of Chandos-street, stating that the Improvements Committee of the London County Council was unable to advise that the widening be undertaken as a County improvement, and suggesting that the work might well be undertaken as a local improvement by the City Council in the usual way.

Wardour-street Widening.—A report was brought up on the question of the widening of Wardour-street. The Council had called the attention of the London County Council to the demolition of certain properties in Wardour-street, and asked that they should undertake to widen the street as a County improvement. The County Council had replied, stating that the street was not a main thoroughfare, and that, as the City Council was already widening the thoroughfare at its southern end, they could not undertake the widening as a County Improvement.

Locomotives on Highways.—It was agreed to appoint Messrs. Tallonts, Dennis, & Payne to a conference at the County Hall, Spring-gardens, on November 18, on the question of the use of heavy locomotives on thoroughfares.

Reinstatement of Trenches.—The Works Committee reported that, with reference to the question of the serious effect upon the life and condition of the pavements of the City caused by the constant opening of the streets by the various undertakers under their statutory powers, a letter was addressed to the undertakers, stating that in order to prevent subsequent sinkage and permanently to restore the pavement as far as possible, to a satisfactory condition, the Council had decided to trim back the edges of the concrete foundation obliquely upon the solid ground on either side of the trench, in order to form a proper support and key for the new concrete, and also to bare a margin along the surface of the old undisturbed concrete on each side, for the reception of the blocks to be relaid. They recommended that it be an instruction to the City Engineer that in future all trenches in paved roads be reinstated in the manner described.—The recommendation was agreed to.

OBITUARY.

MR. HARDY.—Mr. Richard Hardy, who had practised during many years at Wheelersgate, Nottingham, died on November 1. Mr. Hardy was chiefly employed as an architect and engineer by brewers and maltsters; one of the largest works he executed in that capacity is the malting he built seven years ago for Messrs. Walker & Homfray, Ltd., at Retford.

MR. B. T. BATSFORD.—We regret to announce the death, at the age of eighty-three, of Mr. B. T. Batsford, the well-known publisher of architectural works, whose name is familiar to all our professional readers. Bradley Thomas Batsford was born in Hertford in 1821, and was left an orphan at the early age of thirteen. Three years later he bound himself apprentice to Mr. Henry Bickers, the founder of the firm still existing in Leicester-square, for a period of six years. He commenced business in 1837 in a small way as a general second-hand bookseller at No. 30, High Holborn, from which he moved a few years later to No. 52, and was surrounded by at least twenty other booksellers within a radius of a quarter of a mile. For some years he continued to occupy himself with books of a general character, but his proximity to Mr. John Weale, the well-known publisher of architectural and engineering books, who died in 1861, and the large number of architects who had offices in the neighbourhood, some of whom naturally made inquiries of him for professional books, led him to turn his attention to this class of publication, which he eventually made his speciality. It may be noted that for architectural publishers, High Holborn is quite a historic spot, as, within a few doors of one another, there has existed a succession of them for something like a century and a half, the most notable being Mr. John Taylor and Mr. Weale (already mentioned) with whom Taylor was for a time in partnership. Mr. Weale's business ceased to exist some three years after his death, when his stock was dispersed under the auctioneer's hammer by order of the Sheriff, and Mr. Batsford, securing part of the stock, continued to devote himself strenuously to the collecting of books upon architecture, engineering, etc., and soon was able to boast that he had a larger stock of them than had been held by any other London

bookseller. For many years he frequently sent out catalogues which made him widely known as "the architectural bookseller," both at home and in America and the Colonies. He was joined by his eldest son, Mr. Bradley Batsford, early in the Sixties, and some ten years later by his second son, Mr. Henry, who died in 1882. Mr. Herbert, his youngest son, then entering the business. A few years before this, Mr. Batsford had commenced the publication of professional books, amongst his earliest issues being the late Professor Banister Fletcher's Text Books for Surveyors ("Quantities," etc), Mr. Talbert's "Examples of Ancient and Modern Furniture," Mr. Colling's "Examples of Medieval Foliage," Mr. Cutler's "Grammar of Japanese Ornament," etc. This branch of the business was conducted by his eldest son, Mr. Bradley Batsford, as will be known to the many authors for whom the firm has published. Mr. Batsford continued to take an active share in the conduct of the business he had founded until some two years ago, when he relinquished it in favour of his sons, Mr. Bradley and Mr. Herbert, by whom it has since been carried on. His business career extended over a period of some sixty-seven years, and his buoyant spirit and kindness of manner endeared him to many who came in contact with him. He was very devoted to his business, fond of his books (shed tears when he saw the damage done to them when a fire occurred on his premises about twenty-five years ago), and proud of the cordial feeling shown him by many members of the architectural profession. He took an active interest in the Booksellers' Provident Institution, of which he was an early member, and sat on the Board of Directors for some thirty years, acting on the "Relief" and "New Members' Committees. Marrying in 1843 (the year in which he started in business) Mr. and Mrs. Batsford had the happiness of celebrating their diamond wedding nearly two years ago. He leaves, besides his widow, three daughters, and his sons mentioned above. Mr. Batsford not only had (naturally) an exceptional knowledge of architectural publications, but also a very shrewd estimate as to their relative value, as we have often had occasion to observe in conversations with him on the subject.

Mr. H. R. Gough.—We regret to announce the death of Mr. Hugh Roumieu Gough, who died at his London residence on Sunday, at the age of sixty-one. He was the third son of the late Mr. A. D. Gough, and, after serving his articles, he studied in France, Germany, Belgium, and Holland. In 1864 he entered the service of the War Office, being subsequently Chief Draughtsman at Woolwich Arsenal. He commenced practice for himself in 1870, and his subsequent works included St. Cuthbert's Church, at Kensington; the parish church of St. Paul, Hammersmith; the Pro-Cathedral at Bri-banc; the parish churches at Catford, Killamash, Kippax, etc.; and the Cemetery Chapel at Colombo. Mr. Gough had also been employed in the restoration of numerous churches, schools, and houses, and was responsible for the alteration and decoration of the Army and Navy Club in Pall-mall.

BUSINESS PREMISES, DERBY.—New premises have been erected at 37, Market-place, Derby, for Mr. T. Frost. The architects were Messrs. Naylor & Sale, Derby, and the contractor was Mr. Alfred Smith, Derby.

FREE LIBRARY, BROWNHILLS, STAFFORDSHIRE.—The new branch library and public reading-room at Brownhills was opened a short time ago. The building consists of two stories, and on the ground floor are reading and magazine rooms, each of which is about 20 ft. square, opening from central hall, together with the librarian's room for the issue of books. A staircase from the hall leads to the upper floor on which is an assembly or ward room over the reading-room with a platform, and a retiring-room adjoining. The assembly-room will accommodate 120 persons. In the basement there is a heating vault with low-pressure hot-water apparatus. All the rooms are artificially treated with green wood-work, and are furnished with reading tables from designs by the architect, and have terra-cotta walls and ivory friezes, and ceilings carried out in distemper. The exterior has red brick facings and stone dressings, whilst a feature is made of the turret with oriel bay on staircase over entrance. The general contractors are Messrs. Wm. Grant & Sons, Moorland-road, Burslem; the heating has been executed by Messrs. Tagg & Co., Newcastle; and the furniture has been supplied by Mr. W. Cook, Burslem. The whole work has been carried out from the designs, and under the supervision of the architect, Mr. Reginald T. Longden, Burslem, at a total cost, including the site, of 1,250*l.*

GENERAL BUILDING NEWS.

WESLEYAN CHURCH, KEMPSTON, BEDFORD.—A new Wesleyan church and Sunday school was opened at Kempston recently. The designs for the buildings were prepared by Messrs. Gordon & Gunton, architects, of London, and the builder is Mr. S. Foster, Kempston. The buildings are built of Weldon stone, rock faced, with red tile roofs. The elevation facing Bedford-road is the gable end of the nave, flanked by octagonal turrets, battlemented at the top, with a seven-light window in the wall between the turrets. On either side two porches open from the south end of the nave. Each side wall of the nave has three windows of three lights each. There are also two transepts, each with a double gable and possessing four windows of two lights each. The inside measurement of the nave is 70 ft. by 34 ft. 6 in., and the total width between the transepts is 73 ft. (outside measurement). Each transept is 20 ft. by 17 ft. inside. The height of the nave up to the apex of the hammer beam roof is 27 ft.; from the floor to the ridge the height is 36 ft. 6 in., and the height of the side walls is 17 ft. The chapel is built to seat 424 persons. There are open pews, which are fitted at each end with umbrella brackets and dishes.

WESLEYAN CHURCH, PLUCKLEY, KENT.—The opening of the new Pluckley Wesleyan church took place recently. The building will provide seating accommodation for between 100 and 120 persons, and is built of red brick, and has been constructed so that it may be extended if necessary by the addition of a Sunday school. At present it consists of a main hall, rostrum, vestry, porch, and usual out-houses. The windows have lead lights, the ceiling is matchboarded, and a Boyle's ventilator has been fixed. The work was placed in the hands of Mr. J. Day, builder, of Ashford, and it was designed and carried out under the supervision of Mr. A. E. Lacey, architect.

WESLEYAN CHURCH, RAVENSWORTH COLLIERY.—The alterations to the Wesleyan church at Ravensworth have now been completed, and the building was reopened on the 22nd ult. The extensions consist of an addition of 16 ft. to the west end of the original structure. A vestry, 16 ft. by 12 ft., has been added to the north side, separated from the church by a movable wood partition, the whole giving an extra seating accommodation for eighty persons. A stone portico has also been built at the entrance of the church, which faces the Durham-road. The builder was Mr. J. Goblin, Birtley, and the architect Mr. T. Reay, of Low Fell.

WESLEYAN CHURCH AND SCHOOLS, HIGHGATE.—On the 26th ult. the foundation-stones were laid of the new Wesleyan chapel and schools which are being erected at the corner of Jackson's-lane and Archway-road. The church will be of red brick, with stone facings. There is to be an end gallery, nave, side aisles, transept, and chancel, and accommodation will be found for 650 worshippers. The lecture hall and schools adjoining will be of similar design, with seating accommodation for 350, and besides there will be a church parlour, infants' school, and four or five classrooms. The contractors for the work are Messrs. Dorey & Sons, the architect being Mr. W. H. Boney. The total cost, including the site, is estimated at 11,514*l.*

CHURCH, HECKMONDWIKE.—A Consistory Court was held recently in the chancel of the Heckmondwike Parish Church. Mr. W. F. L. Herne (Diocesan Registrar), and the vicar (the Rev. E. E. Jones) laid before the Chancellor the proposed extension scheme. The stonework is perishing, and it is intended ultimately to rebuild the church, but the scheme, for which a faculty was granted by the court, comprises principally the erection of a new chancel and a side chapel. Mr. C. Hodgson Fowler, architect, Durham, has designed the proposed new chancel and side chapel at the parish church, and tenders for the work will shortly be invited. The side galleries will be removed altogether, but at the west end the present accommodation will not be abolished. The roof will be made water-tight. There is now accommodation for 440 persons, which will be increased by about forty-five sittings. It is estimated that the extension will cost 2,700*l.*

WESLEYAN CHURCH AND SCHOOL, HORDEN.—The foundation-stones were laid on the 5th inst. of a new Wesleyan church, with schools adjoining, which is being erected in Thorpe-street, Horden, near Castle Eden. The contractor for the building has been let to Mr. Henry Bell, of Ryhope, and Mr. Joseph Armstrong is acting as clerk of works under the supervision of Mr. J. Walton Taylor, architect, Newcastle, who designed the premises.

WESLEYAN CHAPEL, MILLBRIDGE, YORKSHIRE.—A new Wesleyan chapel has just been opened

at Millbridge, at the junction of the Hall and Leeds roads. An octagonal tower rises a height of 70 ft. at the south-east corner of the structure. The octagonal chancel contains choir stalls, in which two sets of seats will face each other. A communion table has been fixed at the extreme end. The seating accommodation for 300 persons, the floor is divided into centre and side aisles, and a gallery has been erected over a porch. The pews, which are all open, are of pitch-pine, and a wood block floor has been laid. In the chancel dark oak has been used and the pulpit is also of oak. Two vestries for the minister and the other for the choir, have been provided. Messrs. Th. Howdell & Sons, of Leeds, are the architect and the following the contractors:—Messrs. Mr. Allatt, Heckmondwike; joiners, Mr. M. Lazenby Brothers, Leeds; slater, Mr. A. Thompson, Liversedge; plumber, Mr. A. Jackson, Liversedge; plasterer, Mr. G. Wood, Heckmondwike; painter, Mr. Ramsden, Dewsbury; wood block floor, T. K. Yates, Leeds; heating engineer, George Tankard, Leeds; and ironwork, Messrs. B. Tordoff & Sons, Roberttown. WESLEYAN CHAPEL, BOWES, YORKSHIRE.—The 21st ult. new Wesleyan Methodist Sunday schools were opened at Bowes, near Barnard Castle. Mr. Robert Wilson, Barnard Castle, was the architect, and the contractors were Messrs. Masoury, Mr. Walker, Gilmonby; joiners, Messrs. Borrowdale & Sons, Barnard Castle; plumbing work and painting, Mr. C. R. heating apparatus, Mr. Sykes, Darlington. Considerable improvements have also been taken out and replaced on a sloping roof, and the choir stalls have been substituted with the old singing pew. The front wall has been rebuilt, and fitted with Gothic window harmonise with those of the school.

INDUSTRIAL SCHOOL FOR GIRLS, GILMER EDINBURGH.—A new school for girls at Edinburg, the latest addition to Dr. Guthrie's Industrial Ragged Industrial Schools, was opened on the 22nd ult. The structure forms three sides of a quadrangle and is two stories in height. The entrance front, which is 110 ft. 6 in. long, faces the road, and is recessed in the centre on the upper floor. Accommodation is provided for eighty girls. On the ground floor an entrance hall leading into a wide corridor extending nearly the whole length of the frontage, waiting-room, matron's office, officials' dining-room, girls' dining-hall, room with study-room, and other aid, and in the centre overlooking the quadrangle an apartment containing wardrobe for girl. On the south side of the quadrangle arranged the classrooms and the gymnasium and on the north side the kitchen and canteen, store-rooms, etc., and the laundry block. The upper floor contains the officials' bed-rooms and girls' dormitories, and the bath and lavatories are centrally placed between the dormitories. Two staircases give access to the upper floor, and fire escape stairs provided from the dormitories to the ground. All the external walls are constructed of hollow brickwork, with redstone dressing, and harled, tinted a greyish-white. The roof is covered with red tiles. The architects are Messrs. M'Arthy & Watson, Edinburg. WESLEYAN CHURCH, ABERDEEN.—The new school erected by the Aberdeen School Board site on the estate of Sunnybank will form a new road, which the Town Council are constructing. The frontage of the site is 300 ft. and the school building will have a frontage of 153 ft., and will be a three-story structure. Mr. J. A. O. Allan is the Board's architect. The plans provided for the accommodation of 1,169 pupils. On the ground floor is the department, consisting of five classrooms and total accommodation for 337 pupils, a study room, a hall and gymnasium, 49 ft. by 49 ft., and the usual rooms for the staff. On the same floor and at the end of the building near the boys' playground, is situated the boys' entrance and the headmaster's office. On the first floor there are six classrooms providing accommodation for 364 pupils, cloak-rooms and teachers' rooms, and a hall and gymnasium for the junior and senior pupils. This hall is the same size as that situated on the ground floor. On the second floor there are eight classrooms, with accommodation for 466 pupils, two of these rooms are provided for supplementary classes. On the top floor also are situated a cookery and laundry room, with a scullery, and a music instruction-room with a wood store.

WESLEYAN METHODIST SUNDAY SCHOOL, BURNLEY.—The foundation-stones of the new Sunday school at Newburn, which is being erected on a site adjoining the existing Wesleyan church, took place on the 5th inst. The work is being carried out by Messrs. Brown & Bell, of Newcastle, from designs

ered by Messrs. Marshall & Tweedy, also of Westclo.

SCHOOL, HILGAY, NORFOLK.—On the 1st inst. a new church elementary school at Hilgay was opened. The work was carried out from plans prepared by Mr. L. F. Eagleton, of Lynn, at a cost of 1,500l.

WESLEYAN SCHOOL, NEWBURN.—The foundation-stone has just been laid of a new Wesleyan Methodist Sunday School at Newburn. The new building, which is being erected on a site adjoining the Wesleyan church, will have a hall 75 ft. by 41 ft. At the rear of the schoolroom there are to be two vestries for class meetings. The exterior of the building will be faced with red pressed bricks, and have stone dressings to windows, doors, and buttresses; the style being late Gothic. The work is being carried out by Messrs. Brown & Bell, of Newcastle-on-Tyne, from designs prepared by Messrs. Marshall & Tweedy, also of Newcastle.

CATHOLIC SCHOOL, CARDIFF.—Bishop Hedley recently blessed and opened the Roman Catholic Secondary School for Girls at Heathfield House, Richmond-road, Cardiff. Messrs. James & Morgan were the architects, and Mr. Davies the builder.

SCHOOL, WITTINGTON, NEAR MANCHESTER.—The foundation-stone of a new public elementary school, which is to be built in Cavendish-road, Wittington, was laid on the 4th inst. The new school is intended to accommodate, in the first instance, 500 children, but the plans have been so arranged that an extension, which will provide room for another 500, can be made. The exterior will be faced with red London brick, with buff terra-cotta dressings. There are to be a central hall, capable of holding 800 children, with two teachers' retiring-rooms and six classrooms on each of the two floors. The school will have a science-room. There is also to be a detached cookery and manual instruction school. The architect is Mr. Ernest Woodhouse, of Manchester.

RAILWAY MISSION HALL, OXFORD.—The Railway Mission Hall, which has been erected on the Botley-road, was opened on the 3rd inst. The hall is 40 ft. by 30 ft., and there is a vestry, 19 ft. by 12 ft., adjoining. The architect was Mr. Herbert Quinton, and the builders were Messrs. T. H. Kingler & Sons.

LEICESTER-SQUARE.—No. 49, on the west side of the square, has recently been pulled down, the rebuilding on the site, by Mr. F. C. Barber, contractor, of the out-patients' department of St. John's Hospital for Diseases of the Skin. The architects of the new hospital are, we gather, Messrs. Treadwell & Martin.

WORKHOUSE INFIRMARY, EXETER.—The foundation-stone of the infirmary, to be erected as an addition to Exeter Workhouse, was laid the 3rd inst. The new infirmary is being erected on the separate block system, from designs by Mr. R. M. Challice. The complex design comprises five blocks, viz., an administrative block, situated in the "wing," which are located the medical officers' surgery, offices, etc., and the quarters of the nursing staff. From this department covered corridors emerge to the respective wings; block 1, for males and children, providing for sixty-six beds; block 2, the maternity portion, comprising seven beds; block 3, for males, sixty beds; and the consumptive block, providing for thirteen beds; making a total accommodation of 152 beds, exclusive of the nurses' quarters. The wards in each wing are of varying sizes, ranging from eighteen to single beds for separation purposes; each floor is provided with an administration department, comprising duty kitchen, larder, res, etc. Day-rooms are arranged for all the larger wards. The sanitary offices are situated in towers, having a free passage of air between them and the main buildings; they are provided with glazed brick domes. The emergency dressings are provided for at each end of the main blocks. The wards are to be heated by Messrs. Shorwood's Manchester stoves and grates, while the corridors, bathrooms, and sanitary wings are warmed by hot water radiators. The first portion of the complete scheme is now being carried out by Messrs. Ham & Passmore, of Exeter, at a cost (inclusive of main alterations to the existing infirmary) of 500l.

DISPENSARY, HYSON GREEN, NOTTINGHAM.—The foundation-stone of the new Hyson Green church dispensary has just been laid. The building is to be of brick, with external facings of sand brick and Derbyshire stone, and to have a frontage of 93 ft., and a depth of 60 ft., the total cost being estimated at 3,000l. The plan provides for a dispensary and a surgeon's house, the former containing waiting-hall, consulting-room, male and female dressing-rooms, accident and first-aid room, and a dispensing-room. Storage for drugs is provided in the base-

ment, approached by a short flight of stairs from the dispensing-room. The new dispensary, of which Mr. Ernest R. Sutton is the architect, is to be finished by the end of April. Messrs. Vickers & Son are the contractors.

HOME FOR SAINT EPILEPTICS, LANGHO.—On the 25th ult. the foundation-stone was laid of the central administrative block of an epileptics' home for Manchester. The site acquired is at Langho, six miles beyond Blackburn. The architects are Messrs. Giles, Gough, & Trollope, and the contractors Messrs. R. Neill & Sons. The joint committee have acquired upwards of 150 acres of land, and are providing for 240 patients on the home system.

MINERS' INSTITUTE, CAMBOIS, BLYTH.—Viscount Ridley recently opened the new Miners' Hall and Institute which has been erected at Cambois. The building consists of a library, reading-room, billiard-room, smoke-room, and committee-room on the ground floor, the reading-room being 25 ft. by 32 ft. and the billiard-room 35 ft. by 25 ft. The bathroom is also situated on the ground floor. On the upper story there is a public hall, 56 ft. by 36 ft., capable of accommodating between 500 and 600 people, with three ante-rooms and a good platform. The electric light is fitted through a portion of the building, and the heating arrangement is on the hot-water low-pressure system. A caretaker's house adjoins the main building. The total cost is 2,400l., and the structure has been built by Messrs. Cook Brothers, contractors, of Blyth, from the plans of Messrs. T. Tulip & Son, of Whimsey Hill, Choppington. The electric installation is by Mr. R. Robson, of Newcastle, and the heating by Messrs. Emley & Sons.

PUBLIC LIBRARY, RAMSGATE.—The new public library which has been built at Guildford Lawn, Ramsgate, was opened a short time ago. The building has been erected from the designs of Mr. S. D. Adhead, architect, the contract having been carried out by Messrs. Deane & Sons, of Deal. The cost was 7,000l.

MUSEUM AND ART GALLERY, KINGSTON-ON-THAMES.—Lord Rosebery recently opened Kingston's new Museum and Art Gallery, erected on a site adjacent to that of the public library. The principal front of the building is to Fairfield West, and the main entrance is through a carved archway of Bath stone, above which is a stone niche. There is a like recess on either side in brickwork. On the north gable is a round panel of carved brickwork. The roof is covered with tiles, and is surmounted by a miniature tower. The building stands back about 30 ft. from the roadway, and is connected with the free library by an annexe. Internally the museum is 45 ft. long by 24 ft. wide. Leading from the museum, through panelled screens, is the lecture hall, 40 ft. by 27 ft., with a dome roof. The room will accommodate an audience of 200. A staircase of oak gives access to the art gallery, 45 ft. by 24 ft., which is the only room on the first floor. In addition to these main apartments, there is a committee-room, from which access is gained to a strong-room, and a retiring-room, fitted with sanitary appliances. The artificial lighting throughout is by electricity. The ventilation is provided for also by means of an electric fan in the roof. The heating is by means of the hot-water radiator system. The work has been executed by the contractor, Mr. E. Chamberlain, of Ardlestone, for whom Mr. P. Maytum has acted as foreman. Mr. Alfred Cox was the architect for the library. Mr. R. Squelch was clerk of the works.

NEW PREMISES, BRISTOL.—The Cabot Café, in College-green, Bristol, has now been completed. The architects for the new buildings are Messrs. La Trobe & Weston, and the builders Messrs. R. Wilkins & Son.

EXTENSION OF THE POST OFFICE, RICHMOND.—The Richmond post office in George-street is now being enlarged and improved. The work is being carried out by Messrs. B. & E. Nightingale of Lambeth, from plans prepared by Mr. J. Rutherford.

NEW PREMISES FOR THE LIMMER ASPHALTE PAVING COMPANY.—The Limmer Asphalt Paving Company's new premises at Blackwall (at the mouth of the Lea) have a frontage of 430 ft. to the river, with facilities for vessels unloading and loading direct alongside, and 450 ft. to the road, Orchard-place, covering an area of about 2½ acres. The Company were formerly the lessees of only a portion of the property, but purchased the freehold of the whole some few years ago. Certain of the old buildings were demolished and new factories, workshops, offices, stables, offices, and stores are now erected, also a new wharf wall and quay for landing and shipping material. The main factory, which consists of crushing mills, grinding mills, powder floors, spaces for boilers, roasters, grit stores, etc., is of two floors, each floor having an area of about 15,000 ft. super. The substratum

of the site is of that difficult nature which is generally found near the river, and it was consequently necessary to carry down the concrete foundations to a considerable depth, especially next the quay. The buildings are built of stock bricks in cement. The floors are of fireproof construction and supported by steel stanchions. The steel joists used are embedded in concrete and covered with the Company's mineral rock mastic asphalt. The roofs are treated in a similar manner, being laid flat with openings in them to allow materials to be lowered in their places on the respective floors as required. The new stables and loose boxes are lined inside with salt glazed bricks. The Limmer Company's new patent paving, "Lithofalt," is used for paving the stables. A roof, 22 ft. 6 in. high, has been thrown over the yard (53 ft. by 30 ft.) between the buildings so that the vans, etc., may be loaded dry. There are carpenters', engineers', and smiths' shops, and other buildings placed in suitable positions for the proper carrying out of the works. A manager's residence and horsekeeper's cottage are also provided, and abut upon the public roadway. The Company obtain their rock from their own mines in the heart of the Bassin de Syssel, also from Sicily, and Hanover. The raw rock is brought to the wharf in vessels which come alongside the quay, and are unloaded by means of a travelling crane which can run to any part of the wharf and pick up the material from any part of the vessels and deliver either on the roof of the buildings, into the buildings, or into trucks, which are run upon a steel overhead gantry to different parts of the works. A new patent crusher is placed in a sunk basement for the crushing of the rock asphalt, and other disintegrating and mixing machines are placed in proper sequence so that no ground is travelled over twice before the rock, reduced to a fine powder, reaches the boilers and roasters, where it is finished ready for use. The machinery in the new works is driven by electric motors of 120 h.p., and the premises throughout are lighted by electricity, the electric current being taken direct from the mains of the Poplar Borough Council, and thus with the old works the Company have the whole of their machinery duplicated. Messrs. Clarkson, of Poplar and Bloomsbury, were the architects, Messrs. Selby & Saunders, Westminster, were the quantity surveyors, and the several contractors were Messrs. F. & H. F. Higgs, of Loughborough Junction, for the buildings, Messrs. G. Munday & Sons for the river frontage, Messrs. H. J. Cash & Co. for the electric installations for both power and lighting (including motors), and the steelwork was supplied by Messrs. H. T. Shaw & Co., as sub-contractors.

DRILL HALL, LONDON.—Prince Alexander of Teck, on Saturday last, opened a new drill hall and gymnasium at Buxton-street, E. The buildings, which are of brickwork, with steel roofs, were designed and carried out by Mr. Alfred Cox, of Baker-street, W. The contractors being Messrs. F. & E. J. Wood, of Mile End.

SANITARY AND ENGINEERING NEWS.

BRADFORD SEWAGE WORKS.—During the last twelve months, by means of the thirty-two sludge filter presses at the Frizinghall works, 81,295 tons of pressed cake have been made. The small experimental apparatus for the distillation of grease direct from the sludge cake has been removed, and a plant, estimated to be capable of dealing with 13 tons of pressed cake per day, is being put down. A new Lancashire boiler, heated by means of a brick furnace, has been fixed, the fuel used being pressed sludge cake. The sludge filter works at Sandy-lane Sewage Works have been converted into filters for the purification of tank effluent water. The sewage is being purified by chemical precipitation, followed by irrigation on land. Arrangements have been made to connect the main sewer of the Green-gates works with the main sewer of the Galle sewage farm. This farm now receives all the trade effluent of the Idle district. The sewage formerly reaching the Tong works has been diverted to Frizinghall by means of a connecting sewer. The new sewers within the district of Hipperholme, towards the extensive of which the Corporation are contributing, have been constructed, and it is now possible to discharge the sewage of the Lower Wyke district into the Brighouse sewers. This will be done as soon as the agreement with the Brighouse Corporation is completed. The mills discharging liquid refuse into the sewers of the city have been visited from time to time, and during the year thirty-four firms have entered into agreements with the Corporation with reference to trade effluents. Of these, twenty-seven have agreed to pay the Corporation for the treatment

of the effluents, and seven have erected their own plants. In consequence of the engineer's report as to the character and constantly increasing volume of the liquid refuse discharged into the sewers from the various laundries of the city, the committee determined to apply the provisions of the local Act of 1897 to refuse of this nature. A few proprietors of laundries agreed upon terms with the Corporation for the treatment of their refuse with the ordinary sewage of the city, but owing to the intervention of the North-Eastern Laundries' and Dyers' Association, the committee met with resistance in other quarters, their demand that the refuse should either be treated before discharge into the sewers or be dealt with by the Corporation on suitable terms being ignored. Consequently, the committee found it necessary to proceed against one laundry, and this would, no doubt, be treated as a test case to determine the liability of laundry proprietors. The case had been heard before the Stipendiary Magistrate, who had reserved his decision.

WATERWORKS, TARBERT, N.B.—The new Tarbert waterworks were recently opened by Lady Freese Campbell. The works consist of two filters, each 50 ft. by 25 ft., with telescopic tube outlets for gauging the rate of filtration, and with inlets so arranged that, by lowering the water level of the one filter, it can be cleansed with filtered water from the other. At the east end of the filters a sand-washing platform, 40 ft. by 20 ft., has been laid down, with a sand-washing box of modern type. The service tank has a capacity of 190,000 gallons, and is 50 ft. square by 11 ft. 6 in. deep. The old 4-in. main to Tarbert has been supplemented by a 6-in. main, and, as the new filters have been placed at an elevation of 287 ft. above Ordnance datum, or about 100 ft. higher than the old service tank, the pressure within the supply area has been increased. The contractor for the works was Mr. Thomas Christie, Stirling, Messrs. Warren & Stuart, of Glasgow, being the engineers. The cost has been about 3,500.

NEW BRIDGE, KING'S FERRY.—After operations extending over two years, the new railway bridge over the Swale at King's Ferry, which connects the Isle of Sheppey with the mainland of Kent, was completed on the 6th inst. The engineer is Sir Benjamin Baker, who has worked in conjunction with Mr. P. C. Tempest, chief engineer South-Eastern and Chatham Railway. The cost of the structure was about 50,000.

FOREIGN.

FRANCE.—The architectural journal, *Le Bâtiment*, has advertised a competition in its columns for the best design for a type of "barraques" to be erected on the Paris Boulevards during the usual Christmas and New Year's fêtes. It is proposed to considerably enlarge the range of conservatories on the Cours la Reine, Paris, by means of annexes added between the Pont des Invalides and the Pont de l'Alma.—Bartholdi's monument to the aeronauts of the Siege of Paris is to be erected at Neuilly-sur-Seine, on the axis of the Boulevard Couvion St. Cyr.—M. Georges Ermant, architect, of Laon, has been elected President for 1904-5 of the Architectural Society of the Department of Alsace.—A hospital on a great scale is to be built at Soissons.—A new hospital is to be built at Marseilles, at an estimated cost of 600,000 francs.—It is proposed to organise next year, at the Calliera Muscum, an exhibition of the work of the sculptor and ceramic artist, Emile Gallé, who died recently at Nancy.—The death is announced at Isle-sur-Sorgue (Vaucluse) of the painter, Victor Leydet. He was a pupil of Gérôme, and a member of the Société des Artistes Français. He had obtained medals at various Salons; his picture under the title "Le Vendredi Saint" attracted a good deal of notice at the Salon of 1900.

GERMANY.—Mr. C. A. Niessen, H.M. Consul at Cologne, reports that unfavourable business conditions have existed in the cement industry of Rhenish, Prussia, and Westphalia for the past three years, owing to large over production. In 1902 the prices were so low that the cement works could not make any profit. A market was then found in South Germany; but in 1903 the prices in this district likewise fell to such a point as to leave the cement manufacturers no margin. To remedy this state of affairs, a meeting of proprietors of Rhenish-Westphalian Cement Works was summoned last month (October). After negotiations lasting two days, an agreement was arrived at for the establishment of joint sales offices, to last until the end of 1913. A union of the cement works of the Lower Elbe has also been formed, and now negotiations are pending between this syndicate and the Hanover works. Furthermore, a committee at Berlin is making efforts to unite in the first

line the Upper Silesian and the Berlin factories. When an agreement is come to between Upper Silesia and Berlin on the one side, and the Lower Elbe and Hanover group on the other side, common negotiations will be entered into between these two groups.—The new Law Courts at Kreuznach are completed; the designs for the building were planned under the direction of Herr Thoenner.—The engineer, Professor Eduard Gerlich, died on October 14, in his sixty-eighth year; he was formerly Chief Inspector of the St. Gotthard Railway, and has been Professor of Engineering at the Technical Schools in Zurich since 1892.

AUSTRIA.—The "Mozart Fountain" in Mozart Platz Vienna is in course of construction; the fountain is the work of the sculptor, Theodor Wolk, and consists of a large, semi-circular stone basin, from the back of which the water gushes from the mouths of fabulous creatures; the central figures are taken from the "Zauberflöte," and are cast in bronze.—The "Berthold" bridge at Vienna is to be rebuilt in the spring of 1906.

BRIDGE WORK IN SPAIN.—Tenders will be opened on November 29 at the "Direccion General de Obras Publicas" for the construction of (1) a bridge over the river Guadajoz, on the road from Jaén to Códoba, at the upset price of 244,789 pesetas (about 7,120/), and (2) a bridge over a branch of the river Pisuergra, on the road from Saldaña to Masa, in the province of Burgos, at the upset price of 53,977 pesetas (about 1,553/).

MISCELLANEOUS.

COMPENSATION CASES.—It is stated that a sum of 255,672/ is claimed in respect of the freehold property adjoining to St. Clement Danes Charity Schools, and compulsorily acquired by the London County Council for their Strand to High Holborn improvement scheme.—An award to the amount of 13,870/ has been issued by Mr. Daniel Watney, a past President of the Surveyors' Institution, who presided over the arbitration, in settlement of a claim for 27,000/ preferred by the Pwllycrochan Estate Company, of Colwyn Bay, as against the London and North Western Railway Company for lands taken by them to widen their line in that locality.

IMPROVEMENTS, BELFAST.—On the 28th ult. Mr. P. C. Cowan, M.Inst.C.E., Chief Engineering Inspector to the Local Government Board, held an inquiry, at the Town Hall, into the application of the Belfast Corporation for sanction to the following loans:—15,000/ for erecting an additional story to the new Municipal Technical Institute; 48,000/ for the Seddalaham and Kinoy Drainage Works; 16,000/ for the Greencastle Drainage Works; and 2,000/ for erecting an additional fruit market. In the course of the inquiry Mr. Samuel Stevenson, architect of the institute building, said the extra story would provide 21,700 super. ft. additional floor space. A loan of 85,000/ had been originally sanctioned for the institute. The contract price was 81,000/ and architect's and surveyor's fees would come to about 4,000/. Including the new story, which would cost 14,406/ the salary of clerk of works, and other necessary expenditure, the Institute would cost over 100,000/. Mr. H. A. Cutler, City Surveyor, gave evidence at length regarding the proposed drainage works at Sydenham and Greencastle.

CHANCEL SCREEN, ALL SAINTS' CHURCH, DRIFFIELD.—The oak chancel screen, which has been placed in this church, was dedicated on the 1st inst. The screen has been designed by Mr. Temple Moore, of London, and the work has been executed by Messrs. George Shepherdson & Sons, Ltd., Driffield. The work consists of seven principal divisions, filling the width of the chancel arch. The four-light window in the gable of the south wall of the nave, and immediately above the screen, has been filled with painted glass from the studio of Mr. H. Victor Milner, of London.

REBUILDING IN PICCADILLY AND OLD BOND-STREET.—The site of Nos. 57, 58, 59, and 60, Piccadilly and the adjoining Nos. 44, 45, and 46, Old Bond-street, is being cleared for the erection of new premises, after the designs of Messrs. Read & MacDonald, for Messrs. Callard, Stewart, & Watt, confectioners. The former shop, Stewart's, at the corner of the two streets, was established there nearly 200 years ago, and was reputedly the oldest baker's shop in the west part of the town. In July, 1887, it was sold by auction at the Mart for 15,000/—the purchasers being, it was stated at the time, the Prudential Assurance Company—the freehold building site at that corner covering 3,210 ft. super., with frontages to Piccadilly and Old Bond-street, and having extensive vaults. The six houses were

then let for an aggregate rental of 2,410/ per annum under the leases which have recently expired together. Messrs. Howard & Co. are the general contractors for the new building, the steel construction and concrete floors will be supplied by Messrs. Richard Moreland & Sons.

MEMORIAL, ST. ANNE'S CHURCH, ALDERNEY.—An engraved brass has been placed in the porch of the Church of St. Anne at Alderney, in memory of the late John Le Mesurier, M.A., Hon. Canon of Winchester. A memorial Celtic cross of granite has also been placed over the grave of the deceased divine in the graveyard of the Tateley parish church, Hants. Bell memorials have been executed by Messrs. Harry Hems & Sons, of Exeter.

BATH ABBEY.—A public meeting was held at the Guildhall, Bath, on the 4th inst., under the Presidency of Lord Bath, to consider a statement which had been drawn up by Mr. G. Jackson, R.A., upon the condition of Bath Abbey. Mr. Jackson, after recalling the fact that early in August the south-eastern pinnacle of the central tower was struck by lightning, stated that the damage done was less than might have been expected, but that the top 15 ft. of the spirelet was seriously disturbed and some of the stone shattered. There were no conductors on the building, which was obviously in danger from any storm, and should be protected by a complete system of points and copper tapes on the plan he submitted. The removal of the shattered part of the pinnacle had, he was sorry to say, revealed another defect. The whole of the pinnacles, as well as those at the east end of the choir, were put together with iron clamps, which, being near the outside of the stone and exposed to damp, had rusted so seriously as to expand sometimes to twice the original thickness and had thereby disjunctured the masonry to that extent. He recommended that the whole of the four spirelets of the tower and those of the east end should be reconstructed, substituting copper rods as slat dowels for the iron clamps and ties.

The pinnacles had to come down, he thought, would be well to consider whether, instead of the modern bulky pinnacles, they were not substitute pinnacles of a lighter design, something more like those of Malvern Priory and Gloucester Cathedral, which would be a return to what was the character of the original pinnacles as shown by old prints. The north-east pinnacle of the choir was considered, in a dangerous state, and should be seen to without delay. The final was broken across, and the two top courses were left 14 in. on one side. The flying buttresses, which he directed attention more than 20 years ago, were, he believed, put up for ornament and had no work to do until Sir Gilbert Scott vaulted the nave. The vault was now overpowering the buttresses, and the walls had an inclination outwards. He considered it imperative necessary that the walls should be shored at certain points and the flying buttresses reconstructed without delay, or the consequences might be serious. The buttresses had all come over several inches, and it was not safe to leave any of them. Some repairs to the parapets were also needed. The western turrets were prepared for flying buttresses to give the same architectural effect as the west front as was given by similar buttresses at the east end, and though in neither case were they needed for strength, but for beauty, he thought the west front would gain very greatly if these buttresses were added. It was estimated that the whole of the work recommended by the architect would involve an expenditure approximating 4,000/. It was resolved, on the motion of the Bishop of Bath and Wells, seconded by Mr. E. T. Foxcroft, to proceed at once with that part of the work which was considered urgent at a cost not exceeding 3,000/. The erection of the two buttresses at the west end and the question as to the alteration of the character of the pinnacles were deferred.

LIVERPOOL CATHEDRAL.—At a meeting, on the 7th inst., of the Liverpool Cathedral Committee, the Lord Bishop of the Diocese read a letter which he had received from Mr. Arthur Earle, of Childwall Lodge, Wavertree. Mr. Earle asked the Bishop "to be the medium of offering to the Cathedral Committee a sum of 25,000/ for the erection of a Lady Chapel, to be dedicated in due course by the Bishop, with the approval of the donors." The donors," continued Mr. Earle, "are members of the Earle and Langton families. . . . A resolution expressing thanks to the donors and a decision immediately proceed with the building of a Lady Chapel was passed unanimously. The Lady Chapel had been designed by Messrs. G. F. Bodley, R.A., and C. Gilbert Scott, architects of the cathedral. The Committee hope to have it completed by 1909.

25,081 of 1903.—R. PRATT: Rust Prevention Compounds.

A compound consisting of a quickly evaporative and mobile spirit, such as petrol, gasoline, ether, petroleum spirit, benzene, light naphtha, or like material, or any mixture of such material with a rust preventing material such as vasoline, heavy oil, fat, wax, rosin, stearine, spermaceti, balsam, or any mixture of such material, the resulting compound retaining in a sufficient degree the mobility of the spirit.

27,617 of 1903.—H. J. HADDON (G. Malard): Construction of Buildings for the Prevention or Spread of Fire.

The construction of buildings for the prevention or spread of fire, comprising a system of mill, turnstile, or cylindrical drum with wings, and made of incombustible materials, said mill or the like being placed vertically or horizontally in the aperture in the wall separating two parts of a building to completely close same, but permitting the passage of workmen or goods by means of a rotatory movement around an axle or on a central pivot without danger of a current of air or flame affecting the same passage.

17,436 of 1904.—F. HENNEBIQUE: Ferro-Concrete Piles for Quay Walls and other like Constructions.

A system of piles of ferro-concrete (or strengthened beton) for making quay walls or other like constructions, in which a branch is cast on the pile proper, so that the part of the piles driven in at intervals and according to the inclination of the wall, forms with the intermediate sheeting piles the wall proper, whilst the branches form with the upper part of the piles a fork serving as brackets for holding suitable planking, while the branches by themselves serve as a means of attachment for one or more fender beams.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

Table listing estate exchange reports with columns for date, location, description, and price. Includes entries for Hatfield Broad Oak, Franksin & Son, October 31, and various other properties.

November 2.—By BOXTON, SONS & BUCKMASTER.

Table listing property sales by Borton, Sons & Buckmaster, including locations like Fulham, Hampstead, Clapton, Forest Gate, Bow, Bromley, Bayswater, Edgware, Biddlesden, Ferry Fyston, and Woolwich.

Crouch End.—23, Cecil-pk., n.t. 78 yrs., g.r. 107, p. ...

Table listing property sales by other agents, including locations like Crouch End, Streatham, Bow, Sidcup, Hatherley-rd., and various other areas.

MEETINGS.

FRIDAY, NOVEMBER 11. Architectural Association.—Mr. W. Hennan on "Ventilation." 7.30 p.m. MONDAY, NOVEMBER 14. Surveyors' Institution.—The President, Mr. H. T. Stewari, will deliver an Opening Address at 8 p.m. ...

WEDNESDAY, NOVEMBER 16.
Architectural Association Discussion Section.—Mr. W.
Anon of the Society, by Sir William Abney, at Ryckholt-
Builders' Foremen and Clerks of Works' Institution—
Monthly Meeting of the members. 8 p.m.
Institution of Sanitary Engineers, Ltd.—Election Com-
tee. 3 p.m. Examination and Literary Committee,
ance Committee, Organising Committee. Council
ing at 7 o'clock.
Society of Arts.—Inaugural Address of the 151st
on of the Society, by Sir William Abney, at Ryckholt-
, D.S.C., F.R.S., Chairman of the Council. 8 p.m.

THURSDAY, NOVEMBER 17.
 Leeds and Yorkshire Architectural Society.—Address
 of the President, Mr. G. Bertram Bulmer, and distribu-
 tion of prizes. 6.30 p.m.

FRIDAY, NOVEMBER 18.
 Junior Institution of Engineers (Westminster Palace
 Club).—Mr. William H. Lindley, of Ryckholt-
 on, will deliver his Presidential Address, on
 "Unipol Engineering on the Continent." 8 p.m.
 Institution of Mechanical Engineers.—Ordinary
 General Meeting. Mr. A. E. Seaton and Mr. A. Jude
 "Impact Tests on the Wrought Steels of Commerce."
 8 p.m.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters,
 papers read at meetings rests, of course, with the
 authors.
 We cannot undertake to return rejected communica-
 tions, and the Editor cannot be responsible for
 drawings, photographs, manuscripts, or other docu-
 ments, or for models or samples sent to or left at this
 office, unless he has specially asked for them.
 Letters or communications (beyond news items)
 which have been duplicated for other journals are NOT
 REPLIED TO.
 All communications must be authenticated by the
 name and address of the sender, whether for publica-
 tion or not. No notice can be taken of anonymous
 communications.
 We are compelled to decline pointing out books and
 news addresses.
 Any communication to a contributor to write an article,
 to execute or send a drawing for publication, is
 subject to the approval of the article or drawing, when
 received, by the Editor, who retains the right to reject
 any article unsatisfactory. The receipt by the author of
 a proof of an article in type does not necessarily imply its
 acceptance.
 All communications regarding literary and artistic
 matters should be addressed to THE EDITOR; those
 relating to advertisements and other exclusively busi-
 ness matters should be addressed to THE PUBLISHER,
 and not to the Editor.

PRICES CURRENT OF MATERIALS.

Our aim in this list is to give, as far as possible, the
 average prices of materials, not necessarily the lowest.
 Prices and quantities obviously affect prices—a fact
 which should be remembered by those who make use of
 information.

Table with columns: BRICKS, &c. £ s. d.
High Stocks, 1 13 0 per 1000 alongside, in river.
High Stocks, 1 13 0 " " " "
High Stocks, 2 12 0 " " " "
High Stocks, 2 10 0 " " " "
High Stocks, 1 8 0 " " " " at railway dep't.
Wire Cut, 1 14 0 " " " "
Fareham Bed, 3 12 0 " " " "
Red Pressed, " " " "
London Facing, 5 0 0 " " " "
Blue Pressed, " " " "
Affordable, 4 1 0 " " " "
Bullnose, 4 10 0 " " " "
Stourbridge, " " " "
Red Bricks, 4 8 0 " " " "
Red Bricks, " " " "
White and, " " " "
Glazed, " " " "
Stretchers, 13 0 0 " " " "
Stretchers, 12 0 0 " " " "
Flats, 17 0 0 " " " "
Stretchers, 19 0 0 " " " "
Stretchers, 16 0 0 " " " "
Sides and, 19 0 0 " " " "
Sides and, 20 0 0 " " " "
Cham, " " " "
red, Squints, 20 0 0 " " " "
Dipped Salt, " " " "
Glazed Stretch-, " " " "
ers and Header, 12 0 0 " " " "
Bullnose, " " " "
Flats, 14 0 0 " " " "
Stretchers, 15 0 0 " " " "
Stretchers, 14 0 0 " " " "
Stretchers, 15 0 0 " " " "
Stretchers, 15 0 0 " " " "
Sides and, 15 0 0 " " " "
Sides and, 15 0 0 " " " "
to End, 20 0 0 " " " "
Cham, " " " "
red, Squints, 14 0 0 " " " "
Quality, " " " "
and, " " " "
Salt, " " " "
and, 2 0 0 " " " " less than best.
s. d.
uses and Pit Sand, 7 0 per yard, delivered.
uses Ballast, 6 0 per ton, "
Portland Cement, 29 0 per ton, "
Ground Blue Lias Lime 20 0 "
The cement or lime is exclusive of the ordinary
charge for sacks.
Stone Lime, 12s. 0d. per yard, delivered,
Freely Priced at 27s. 6d. per ton at rly. dep't.

STONE.
BATH STONE—delivered on road wag- a. d.
gons, Paddington Depot 1 6 1/2 per ft. cube.
Do. do. delivered on road waggon,
Nino Elms Depot 1 8 1/2 " " "

PORTLAND CEMENT (20 ft. average)—
Brown Whited, delivered on road
waggon, Paddington depot, Nino
Elms depot, or Pimlico Wharf, 2 1 " "
White Based, delivered on road
waggon, Paddington depot, Nino
Elms depot, or Pimlico Wharf, 2 2 1/2 " " "

YORK STONE—Robin Hood Quality.
Scrapped random blocks 2 10 " "
landings to sizes
(under 40 ft. super.) 2 3 per ft. super. "
6 in. rubbed two sides " " " "
ditto, ditto, 2 6 " " " "
3 in. sawn two sides " " " "
slabs (random sizes) 0 11 1/2 " " " "
2 in. to 2 1/2 in. sawn one
side slabs (random sizes) 0 7 1/2 " " " "
1 1/2 in. to 2 in. ditto, ditto 0 6 " " " " "

HARD YORK.—
Scrapped random blocks 3 0 per ft. cube,
6 in. sawn two sides,
landings to sizes
(under 40 ft. super.) 2 8 per ft. super. "
6 in. rubbed two sides " " " "
ditto " " " "
3 in. sawn two sides " " " "
(slabs random sizes) 1 2 " " " "
3 in. self-faced random
slabs " " " "
Horton Wood (Hard Bed) in blocks 2 3 per ft. cube,
deld. rly. dep't.
" " " " 6 in. sawn both
sides landings 2 7 per ft. super.
deld. rly. dep't.
" " " " 3 in. do. 1 2 1/2 " " "

SLATES.
in. in. £ s. d.
20 x 10 best blue Banor 13 2 6 per 1000 of 1200 at r. d.
20 x 12 " " " " 13 17 6 " " "
20 x 10 first quality " " " " 13 0 0 " " "
20 x 12 " " " " 13 15 0 " " "
16 x 8 " " " " 7 5 0 " " "
20 x 10 best blue Port-
land " " " " 12 12 6 " " "
16 x 8 " " " " 6 12 6 " " "
20 x 10 best Kureka un-
fading green " " " " 15 17 6 " " "
20 x 12 " " " " 13 7 6 " " "
18 x 10 " " " " 13 5 0 " " "
16 x 8 " " " " 10 5 0 " " "
20 x 10 ornament green 11 12 6 " " "
18 x 10 " " " " 12 6 " " "
16 x 8 " " " " 6 12 6 " " " "

TILES.
Best plain red roofing tiles. 42 7 per 1000 at rly. dep't.
Hip and Valley tiles " 3 7 per doz. " "
Best Broseley tiles " 50 0 per 1000 " "
Do. Ornamental tiles " 52 6 " " "
Hip and Valley tiles " 4 0 per doz. " "
Best Banbor red, brown, or
brided do. (Edwards) 57 6 per 1000 " "
Do. Ornamental do. " 60 0 " " "
Hip tiles " 4 0 per doz. " "
Valley tiles " 3 0 " " "
Best Red or Mottled Stafford-
shire do. (Peakes) 51 9 per 1000 " "
Do. Ornamental do. " 54 6 " " "
Hip tiles " 4 1 per doz. " "
Valley tiles " 3 8 " " "
Best "Rosemary" brand
plain tiles " 48 0 per 1000 " "
Best Ornamental tiles " 50 0 " " "
Hip tiles " 4 0 per doz. " "
Valley tiles " 3 8 " " "
Best "Hartshill" brand
plain tiles, sand faced, 50 0 per 1000 " "
Do. Pressed " 47 6 " " "
Do. Ornamental do. " 50 0 " " "
Hip tiles " 4 0 per doz. " "
Valley tiles " 3 6 " " " "

WOOD. At per standard.
Deals: best 3 in. by 11 in. and 4 in. £ s. d. £ s. d.
by 9 in. and 11 in. 15 10 0 16 10 0
Deals: best 3 by 3 " 14 10 0 15 10 0
Battens: best 2 1/2 in. by 7 in. and
3 in. by 7 in. and 3 in. by 8 in. 11 10 0 12 10 0
Battens: best 2 1/2 by 6 and 3 by 6 " 0 10 0 less than
7 in. and 8 in.
Deals: seconds " 1 0 0 less than best
Battens: seconds " 0 10 0 " "
3 in. by 4 in. and 2 in. by 6 in. 9 0 0 9 10 0
2 in. by 4 1/2 in. and 2 in. by 5 in. 8 10 0 9 10 0
Foreign Sawm Boards—
1 in. and 1 1/2 in. by 7 in. 0 10 0 more than
battens.
3 in. " " " " 1 0 0 " "
At per load of 50 ft.

Fir timber: best middling Danzig
or Memel (average specification) 4 10 0 5 0 0
Seconds " 4 5 0 4 10 0
Small timber (8 in. to 10 in.) " 3 12 6 3 15 0
Small timber (6 in. to 8 in.) " 3 0 0 3 10 0
Swedish balks " 2 15 0 3 0 0
Pitch pine timber (30 ft. average) 3 5 0 3 15 0
JOINERS' WOOD. At per standard.
White Sea: first yellow deals,
3 in. by 11 in. 23 0 0 24 0 0
3 in. by 9 in. 21 0 0 22 10 0
Battens, 2 1/2 in. and 3 in. by 7 in. 17 0 0 18 10 0 "

WOOD (continued). At per standard.
JOINERS' WOOD (continued). At per standard.
White Sea: second yellow deals, £ s. d. £ s. d.
3 in. by 11 in. 18 10 0 20 0 0
3 in. by 9 in. 17 10 0 19 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 13 10 0 14 10 0
Third yellow deals, 3 in. by 11 in.
and 9 in. " " " " 15 10 0 16 10 0
Battens, 2 1/2 in. and 3 in. by 7 in. 11 10 0 12 10 0
Petersburg: first yellow deals,
3 in. by 11 in. 21 0 0 22 10 0
Do. 3 in. by 9 in. 18 0 0 19 10 0
Battens, 2 1/2 in. and 3 in. by 7 in. 13 10 0 15 0 0
Second yellow deals, 3 in. by
11 in. " " " " 16 0 0 17 0 0
Do. 3 in. by 9 in. " " " " 14 10 0 16 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 11 0 0 12 10 0
Third yellow deals, 3 in. by
11 in. " " " " 13 10 0 14 0 0
Do. 3 in. by 9 in. " " " " 13 0 0 14 0 0
Battens, 2 1/2 in. and 3 in. by 7 in. 10 0 0 11 0 0
White Sea and Petersburg:—
First white deals, 3 in. by 11 in. 14 10 0 15 10 0
3 in. by 9 in. 13 10 0 14 10 0
Battens " " " " 11 0 0 12 0 0
Second white deals, 3 in. by 11 in. 13 10 0 14 10 0
3 in. by 9 in. 12 10 0 13 10 0
Battens " " " " 9 10 0 10 10 0
Fitch pine: 2 in. deals extra " " " " 16 10 0 20 0 0
Under 2 in. thick extra " " " " 0 10 0 0 0
Yellow Pine—First, regular sizes 40 0 upwards.
Oldtimers " " " " 28 0 0
Seconds, regular sizes " " " " 30 0 0
Yellow Pine oddments " " " " 25 0 0
Kapiti Pine—Planks, per ft. cube, 0 3 6 0 5 0
Danzig and Stettin Oak Logs—
Large, per ft. cube " " " " 0 2 6 0 3 6
Small " " " " 0 2 3 0 3 6
Wainscot Oak Logs, per ft. cube, 0 5 0 0 5 6
Dry Wainscot Oak, per ft. sup. as
mch " " " " 0 8 0 0 9 0
3 in. do. do. " " " " 0 7 0 0 7 0
Dry Mahogany—Honduras, Ta-
lisco, per ft. super. as inch " " " " 0 0 9 0 1 0
Selected, Figury, per ft. sup. as
mch " " " " 0 1 6 0 2 6
Dry Walnut, American, per ft. sup.
as inch " " " " 0 10 0 0 1 0
Teak, per load " " " " 17 0 0 21 0 0
American Whitewood Planks,
per ft. cube, " " " " 0 4 0 0 0 0
Prepared Flooring, Per square.
1 in. by 7 in. yellow, planed and
shot " " " " 0 13 6 0 17 6
1 in. by 7 in. yellow, planed and
matched " " " " 0 14 0 0 18 0
1 1/2 in. by 7 in. yellow, planed and
matched " " " " 0 16 0 0 1 0 0
1 in. by 7 in. white, planed and
shot " " " " 0 12 0 0 1 1 6
1 in. by 7 in. white, planed and
matched " " " " 0 12 6 0 0 15 0
1 1/2 in. by 7 in. white, planed and
matched " " " " 0 15 0 0 0 16 6
3 in. by 7 in. yellow, matched
and beaded or V-jointed brds. 0 11 0 0 0 13 6
1 in. by 7 in. do. do. 0 14 0 0 0 18 0
1/2 in. by 7 in. white, do. do. 0 10 0 0 0 11 6
1 in. by 7 in. do. do. do. 0 11 6 0 0 13 6
6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.
In London, or delivered
Railway Vans, per ton.
Rolled Steel Joists, ordinary £ s. d. £ s. d.
sections 5 15 0 " 6 15 0
Compound Girders, ordinary
sections 7 12 6 " 8 15 0
Angles, Tees and Channels, ordi-
nary sections 7 7 6 " 8 7 6
Pitch Plates " 7 15 0 " 8 5 0
Cast Iron Columns and Stan-
chions including ordinary pat-
terns 6 12 6 " 7 15 0 "

METALS. Per ton, in London
£ s. d. £ s. d.
Iron—
Common Bars 6 15 0 " 7 5 0
Staffordshire Crown Bars, good
merchant quality " 7 5 0 " 7 15 0
Staffordshire " Marked Bars " 9 10 0 " "
Mild Steel Bars, do. do. " 8 5 0 " 8 15 0
Hoop Iron, basic price " 8 15 0 " 9 0 0
" Galvanized " 16 10 0 " "
("And upwards, according to size and gauge.)
Sheet Iron, Black—
Ordinary sizes to 20 g. 9 0 0 " "
" 24 g. 10 0 0 " "
" 26 g. 11 15 0 " "
Sheet Iron, Galvanized, flat, ordinary quality—
Ordinary sizes—6 ft. by 2 1/2 ft.
3 ft. to 20 g. 12 10 0 " "
Ordinary sizes to 23 g. and 24 g. 12 10 0 " "
" 26 g. 13 10 0 " "
Sheet Iron, Galvanized, flat, best quality—
Ordinary sizes to 29 g. 13 0 0 " "
" 22 g. and 24 g. 15 10 0 " "
" 26 g. 17 0 0 " "
Galvanized Corrugated Sheet—
Ordinary sizes 6 ft. to 8 ft. 20 g. 13 0 0 " "
" 22 g. and 24 g. 13 10 0 " "
" 26 g. 15 5 0 " "
Best Soft Steel Sheets, 6 ft. by 2 ft.
to 3 ft. by 20 g. and thicker 11 0 0 " "
Best Soft Steel Sheets, 22 g. & 24 g. 12 0 0 " "
" 26 g. " 13 5 0 " "
Cut nails, 3 in. to 6 in. " 8 10 0 " 9 0 0
(Under 3 in., usual trade extras.)

LEAD, &c. Per ton, in London.
£ s. d. £ s. d.
LEAD—Sheet, English, 3 lb. and up 15 7 6 "
Pipe in coils " 15 17 6 "
Soft pipe " 18 7 6 "
Compo pipe " 18 7 6 "
Zinc—Sheet—
Vieille Montagne " 28 0 0 "
Silesian " 27 15 0 "
PRICES CURRENT.—Continued on page 506.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designation
*New Police and Fire Brigade Stations	City & County of Bristol Watch Com.	Not stated	No c

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tender
Repairs to Nos. 1-24, Knott's-terrace, Tanner's-hill	Deptford Borough Council	T. Corfield, Borough Surveyor, 493, New Cross-road, S.E.	Nov
Repairs to No. 47, Tanner's-hill	do.	do.	d
Steam Boiler for Whitefield-street Baths, W.	St. Pancras Borough Council	H. T. Richards, Town Hall, Pancras-road, N.W.	d
Painting Corporation Properties	Carlisle Corporation	H. C. Marks, City Engineer, 38, Fisher-street, Carlisle	d
Two Houses, Machen	do.	F. G. Webb, Architect, Lower Machen	d
Hire of 12-Ton Steam Roller	Springhead U.D.C.	M. Clerke, Surveyor, Springhead, Oldham	d
Street Works, Copperfield-street, etc.	Blackburn Highway Committee	W. Stubbs, Borough Engineer, Municipal Office, Blackburn	d
Reconstruction of Freebies, Queen-street, Ambia	Messrs. Akroyd & Hume	W. Burton, 49, Queen-street, Alnwick	d
120 yds. of 10-ft. Clear Deck Spans	Rohilkund and Kumaon Rly. Co.	E. I. Marryat, 237, Orsham House, Old Broad-street, London, E.C.	Nov
Alterations to Board Room, Eastgate Workhouse	Workshop Guardians	T. Webster, Architect, Newcastle-avenue, Workop	d
Rain-water Cistern, etc., at Kilton Hill Infirmary	do.	do.	d
Fence Wall, Kilton Hill Infirmary	do.	do.	d
Public Hall, New Mill, Keith, N.B.	do.	Mr. Johnston, The Schoolhouse, Keith	d
Lecture Hall, Strand Free. Church, Sydenham, Belfast	do.	J. Frazer & Son, Engineers & Architects, 117, Victoria-st., Belfast	d
Retorts, Firebricks, etc., at Gasworks	do.	J. W. Allin, Gas Engineer, Chorley	d
100 Cast-iron Pipes, 3 in. diameter	Cherley Corporation	do.	d
Sewerage Works, Bridge-street, Wentworth-place, etc.	Wicklow U.D.C.	Town Hall, Wicklow	d
Clinker Crushing Plc., Destructor Wks., Parkview-rd.	Tottenham U.D.C.	W. H. Prescott, Engineer, 712, High-road, Tottenham	d
Recreation Ground, etc., Caspally	Caspally U.D.C.	A. O. Harpur, Surveyor, Council Offices, Caspally	d
Two Dwelling Houses, Embay, near Skipton	Messrs. Smith & Stephenson	H. Varley, Architect, Skipton	d
Road Material	Sheerness U.D.C.	T. F. Berry, Surveyor, Council Offices, Trinity-rd., Sheerness	d
Eight-eighth Orinal, Military-row, Portsea	Portsmouth Corporation	Borough Engineer, Town Hall, Portsmouth	d
Repairs, etc., to Harthead Farm	Ashton-under-Lyne, etc., Hos. Board	J. Lowe, Sanitary Surveyor, Health Depart., Ashton-under-Lyne	d
Extra High Tension Feeder Mains	Hammer-smith Borough Council	G. Gilbert Bell, Electricity Works, 57, Fulham Palace-road, W.	Nov
Draw Boxes, Frames, Covers, etc.	do.	do.	d
Motors, Cables, and Blast Fan	East India Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	d
Wheels, etc., for Colliery Trucks	do.	do.	d
Colliery Tube	do.	do.	d
930 yds. of 9-in. Stoneware Sewer, Chart-h., Brasted	Sevenoaks R.D.C.	T. Hennell, Engineer, Parliament-mansions, Victoria-street, S.W.	d
Street Works, Shakespear-avenue, etc.	Wick U.D.C.	do.	d
Road Material	Birkenhead Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead	d
Eaving Material	Margate Corporation	E. A. Borg, Borough Surveyor, Margate	d
Firemen's Quarters, Charnley-road, etc.	Poplar Borough Council	H. Varley, Architect, Poplar, E.	d
720 yds. of 3-in. Cast-iron Mains at Henstridge	Blackpool Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	d
Branch Store and Houses, Sheldon-l., East Ardsley	Morley Industrial Co-op. Soc., Ltd.	C. Combes, Engineer, Tisbury	Nov
Tress for Street Planting	Southern-on-Sidon Corporation	R. Castle & Son, Archts., London City & Mid. Bk. clubs, Cleckheaton	d
Workshop, Lossil Wynd	Mr. J. Younson	B. C. Dolg, Architect, Elgin	d
Stables, Entrance Gateway, etc., Kendal	Mr. J. W. Fothergill, J.P.	J. Bantley, 7, Lower-street, Kendal	d
Freebies at Keady, Co. Armagh	Northern Banking Co., Ltd.	W. H. Stephens & Sons, Surveyors, Donegal-sq. North, Belfast	Nov
*Steel Bridge over the Komet at Thatcham, etc.	Berkshire County Council	Borough Engineer, Broadway-buildings, Reading	d
*New Coastguard Buildings at Uzon, Forfar	Admiralty	Supting. Engr., H.M. Naval Estab., Rosyth, Inverkeithing, N.B.	d
*New Coastguard Buildings at Freeston, Lincoln	do.	Admiralty Office, 21, Northumberland-avenue, W.C.	d
3,000 yds. of Canvas Hose	Manchester Fire Brigade Committee	W. H. Tisbot, Town Hall, Manchester	Nov
Flechy Retorts, etc.	Leeds Corporation	R. H. Townsley, Gas Office, East-parade, Leeds	d
Steam Boiler at Infectious Diseases Hospital	Dewsbury Joint Hospital Board	Holtom & Fox, Architects, Corporation-street, Dewsbury	d
Silico Keeper's Hse., West Bangour Farm, nr. Uphal	Edinburgh District Lunacy Board	J. & A. Leslie & Reid, Engineers, 724, George-street, Edinburgh	d
One Mile of Railway, etc., at Gayleside, nr. W. Calder	Young's Patent Light, etc., Co., Ltd.	D. & G. R. Rankine, Engineers, 238, West George-street, Glasgow	Nov
School Buildings (Contract No. 1), Llandudno	Conway with Llandudno Local Gov. Bd.	A. A. Humphreys, Architect, Llandudno	d
Tramway Depot, Collins-street, Wakefield-road	Bradford Corporation	F. E. P. Edwards, City Architect, Brewery-drook, Bradford	d
Stores	Caledonian Railway Co.	J. Lorimer, Caledonian Railway, Charles-street, St. Rollox, Glasgow	d
Relief Station & Gilder's Hse., Cranmer-rd., Mitcham	Croydon Guardians	Chart, Sons, & Reading, Archts., Union Bank Chambers, Croydon	d
Two Workmen's Dwellings, Port Tennan	Swansea Harbour Trust	J. Thomas, Architect, 32, Fisher-street, Swansea	Nov
Lako Works, Northwood Park, Hanley	Hanley Corporation	J. Lobley, Borough Engineer, Town Hall, Hanley	d
Private Street Works, The Grove, etc.	Finchley U.D.C.	Surveyor, Council Offices, Church End, Finchley	d
Furnishing Public Offices, Mountain Ash	Mountain Ash U.D.C.	Surveyor to Council, Public Offices, Mountain Ash	d
Electric Overhead Travelling Frames	Manchester Tramways Committee	J. M. McElroy, Tramways Department, 55, Piccadilly, Manchester	d
*Underground Sanitary Convenience, Plaistow	C.B. of West Ham	Baldwin Latham, Eng., Parliament-mansions, Victoria-street, S.W.	Nov
Six Miles of Pipe Sewers, etc.	Hayward's Heath U.D.C.	W. A. Tait, C.E., 724, George-street, Edinburgh	d
Alnwick Hill Filters, etc.	Edinburgh & District Water Trustees	Surveyors' Department, Council Offices, Wansleat, N.E.	d
*Norwegian Granite Edge Kerb	Wansleat U.D.C.	do.	d
*Erection of Kitchen at Casual Wards	Lambeth Guardians	N. P. Pattinson, Borough Engineer, Town Hall, Gateshead	Nov
Street Paving	Gateshead Corporation	do.	d
Sewerage of Acock's-green, South-east	Yardley R.D.C.	A. W. Smith, Engineer, Council House, Sparkhill, nr. Birmingham	d
600 Hall Sewage Works	do.	do.	d
Road Material	Warwickshire County Council	J. Willmott, County Surveyor, Birmingham	d
*Erection of southfield-road School, Bedford Park	Acton U.D. Education Committee	E. C. P. & H. Monson, Grosvenor House, Acton Vale, W.	d
Stores	Cheshire Lines Committee	S. Saxon Barton, Stores Supt., Cheshiro Lines, Warrington	Nov
Laying, etc., Asphalt Pavements, etc.	Worcester Corporation	T. Calk, City Engineer, Guildhall, Worcester	d
*New Royal Naval Reserve Establishment at Lowestoft	Admiralty	Works Department, Admiralty, 21, Northumberland-avenue, W.C.	d
*New Coastguard Building at Peel, Isle of Man	do.	do.	d
*New Coastguard Building at Ingoldmells, Lincoln	do.	do.	d
House at Crawfordshill	Col. Sherman-Crawford	do.	d
Sewerage Works	Fleetwood U.D.C.	S. C. Hunter, Scottish Provision-buildings, Belfast	d
Free Library, Reading-rooms, etc.	Sowerby Bridge U.D.C.	G. R. Strachan, Engineer, 9, Victoria-street, Westminster	Nov
Glazed Stoneware Sanitary Pipes (N. Disposal Wks.)	Harrogate Corporation	Engineer, Hollings Hill-lane, Sowerby Bridge	d
Improvements to Sch. Offices, Burnham Westgate Schl.	Norfolk Education Committee	E. W. Dixon, Engineer, 1A, Cambridge-crescent, Harrogate	d
Street Works, Edward-street, Manselton	Swansea Corporation	Rev. E. Kynaston, Burnham Market, Norfolk	Nov
Stoneware Sewers (Branksome Drainage)	Branksome U.D.C.	J. Taylor, Sons, & Santo Crum, Engineers, 27, Gt. George-st., S.W.	Nov
Cast-iron Sewers (Branksome Drainage, Contract 1)	do.	do.	d
Stores (Cardiff firms only)	Cardiff Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff	Dec
Lead Service Works (Cardiff firms only)	do.	do.	d
Jobbing Masons' Work	do.	do.	d
Street Surface Covers	do.	do.	d
*New House at Greenock	Admiralty	Director of Works Depart., 21, Northumberland-avenue, W.C.	Dec
Direct-acting Steam Duplex Pump	Essex County Assizes, Brinkwood	Medical Officer, Esplanade, Westminster	Dec
Six Motor Vehicles for Omnibus Service	Cambrian Railway Co.	H. E. Jones, Locomotive Superintendent, Gwent-st., Cardiff	d
Boilers, Machinery, Heating, etc., Handsworth	Haudsworth U.D.C.	J. P. Osborne, E.R.I.B.A., 25, Colmore-row, Birmingham	Dec
*Public Baths, etc., in Grove-lane	do.	do.	d
Alterations to Gann Hall-road School	Leyton D.C. Education Committee	W. Jaques, Architect, 2, Fen-court, Finchurch-street, E.C.	Dec
*Building of Water Tower	East Cowes U.D.C. (Isle of Wight)	Council's Surveyor, Town Hall, East Cowes	d
*New Engine House, etc.	do.	do.	d
*Engine Section and Gas Plant	do.	do.	d
*8-in. Mains from Waterworks to Tower	do.	do.	d
*Taking-out and Refixing Old Pumps	do.	do.	d
*Set of 8-in. 3-throw Deep Well Pumps, etc.	do.	do.	d
*Tramway Offices in Chingford-road	Walthamstow U.D.C.	Council's Engineer, Town Hall, Walthamstow	d
Sewage, etc., Works	Chippenham U.D.C.	A. E. Adams, Engineer, High-street, Chippenham, Wilts.	Dec
Steam Bony Vessel	Rangoon Port Trust	Ogily, Gillanders, & Co., Sun-court, 67, Cornhill, London	Dec

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be delivered. Includes entries for works at Leeds, Liverpool, and various engineering projects.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be by. Includes an appointment for Southern Nigeria P.W.D.

Those marked with an asterisk (*) are advertised in this Number. Competitions, iv. Contracts, iv. vi. viii. x. Public Appointments, xix.

CES CURRENT.—Continued from page 503.

Table listing prices for LEAD, &c. (continued) with columns for quantity and price per ton.

Table listing prices for ENGLISH SHEET GLASS IN CRATES with columns for quantity and price per ton.

Table listing prices for OILS, &c. with columns for quantity and price per gallon.

Table listing prices for VARNISHES, &c. with columns for quantity and price per gallon.

TERMS OF SUBSCRIPTION.

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TENDERS.

Communications for insertion under this heading should be addressed to 'The Editor,' and must reach us not later than 10 a.m. on Thursdays. T.N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100s., unless in some exceptional cases and for special reasons.

BATTLE.—For drainage works, Battle-hill, for the Urban District Council. Mr. A. Gray, Engineer, Town Hall-chambers, Hastings. W. L. Wallis & Co., Eastbourne ... £1,456 5 6

BOGNOR.—For steelwork for covering in sewage tanks, for the Urban District Council. Mr. O. A. Worthington, Bognor.—A. D. Draxway Engineering & Wagon Co. £167 2 6 Baxondale Boulton & Paul 152 0 0 Bros. 115 0 0 Rubery & Co. 150 0 0 W. Wainwright 112 15 0 Heenan & E. Bird & Co. 107 0 0 Franks, Ltd. 140 0 0 Drew, Bear, Perks, & Co. 107 0 0 J. Every 133 17 6 J. Cochrane 106 8 9 W. Lucy & Co. 130 0 0 Marchant Bros. 101 0 0 R. Morland & Son, Ltd. 130 0 0 H.C. 102 10 0 Measures Bros. 128 15 0 O. Thompson & Co., Ltd. 121 0 0 Co. 94 10 0 W. A. Baker & Co., Ltd. 120 0 0 D. H. Mortimer ... £9 19s. 0d. per ton.

DINAS POWIS.—For erecting a small masonry bridge, for the Llandudno and Dinas Powis Rural District Council. Mr. J. Holden, engineer, 20, Park-place, Cardiff. For Masonry and Fixing Ironwork. H. Fraser ... £187 8 6 W. Rees ... £119 12 9 Mezey & Son 136 6 0 J. Britton, F. Ashley 135 2 6 Dina Powis, C. Davies ... 120 2 6 Cardiff ... 106 10 2

For Supplying Ironwork. C. F. Dewdney ... £95 W. Baker & Co., Newport, Mon.* ... £80

DUNMOW (Essex).—For the erection of an isolation hospital, with administrative block, offices, fencing, etc. at Dunmow, in the county of Essex, for the Dunmow District Council. Messrs. C. & W. H. Pertwee, architects, Chelmsford, Essex. Quantities by Messrs. R. L. Curtis & Sons, T. A. Goodey £4,360 0 0 & Co. ... £5,000 0 0 W. Which ... £4,349 0 0 Smith & Son 4,745 0 0 E. C. Thurman ... £3,238 14 0 Co. ... £4,680 0 0 W. Roberts ... £4,304 0 8 Dowling & Sons ... £4,670 0 0 J. McKay ... £4,197 0 0 Brown & Son 4,640 0 0 F. W. Burwell ... £4,112 0 0 F. & E. Davey 4,532 0 0 S. A. Koney 4,085 0 0 E. Dix ... 4,498 0 0 T. Almond & Baynard & Son ... 4,397 10 0 D. B. Cowell ... 4,050 0 0 Laurence & Son ... 4,294 0 0 Son ... 3,998 10 0 Colulson & Parren & Lots ... 4,372 0 0 Son, Enth ... 3,952 13 6

GRAVESEND.—For erecting a public library in Windmill-street, for the Town Council. Mr. E. J. Bennett, architect, 191, Parrock-street, Gravesend.—A. E. Tong, Darnley-road, Gravesend ... £5,316 11

HENCOED.—For erecting two shops and twenty houses, for the Sunny Bank Cottage Co., Ltd. Mr. G. A. Trhame, engineer and architect, 18, Canon-street, Aberdare.—D. Raymond, 14, Taff-embankment, Cardiff ... £196 per house.

HOUGHTON - LE - SPRING.—For street works (Thornhill-street, Violet-street, Wallace-street, etc.), for the Urban District Council. Mr. J. W. Holbrook, Surveyor to Council, Houghton-le-Spring. Quantities by Surveyor.—M. P. Balmer & Sons ... £913 12 0 W. Treadlock & Co. ... £541 2 10 G. E. Simpson 693 3 1 MacLaren & W. Craig ... 677 9 7 Co. ... 498 2 11 J. W. White ... 593 10 0 J. MacLaren & Co., Gostorth ... 445 5 6 [Surveyor's estimate, £548 5s. 10d.]

LLANDUDNO.—For extension of Trinity-street, for the Urban District Council. Mr. E. P. Stephenson, Engineer and Surveyor, Town Hall, Llandudno.—G. Roberts ... £1,753 18 7 Bro. ... £2,417 0 0 G. Reed & Son 1,680 0 0 F. Harrop ... 2,296 15 1 R. L. Roberts, Contractor, 1,683 9 6 G. A. Watson & J. Booth ... 2,257 17 1 F. Mitchell & R. Williams & Son ... 2,134 18 9 Son ... 1,800 0 0 Hughes & Rowlands ... 1,864 15 3

LONDON.—For paving works in High-road, Chiswick. Mr. J. Barclay, Engineer and Surveyor, Town Hall, Chiswick, W. —Woodham & Sons ... £516 0 0 Wimpy & Co. 488 4 2 Harvey Bros. ... 478 8 0 L. J. Sheffield ... 215 0 0 Swaker & Co., Builders ... 587 18 3 Whitton & Co. ... 560 0 3 C. R. Gurr & Sons ...

LONDON.—For covered playshed, Rushmore-road, Hackney, for the Education Committee of the London County Council.—G. Barker ... £228 10 J. Grover & Son £204 0 Turnbull & Son ... 229 0 McCormick & Sons 198 0 A. J. Sheffield ... 315 0 Yigor & Co. ... 192 0 F. Bull ... 211 0 J. T. Robey, 194, Barrett & Power 207 0 Bow-road ... 185 0

LONDON BOARD OF EDUCATION TENDERS. Hackney, S., Rushmore-road (Covered Playshed). G. Barker ... £228 10 J. Grover & Son £204 0 Turnbull & Son ... 220 0 McCormick & Sons 198 0 A. J. Sheffield ... 215 0 Yigor & Co. ... 192 0 F. Bull ... 211 0 J. T. Robey, 194, Barrett & Power 207 0 Bow-road ... 185 0

"Shaftesbury" Training Ship (New Boiler). That expenditure not exceeding 370l. be sanctioned for providing and using a new semi-portable loco-type boiler, 20-hp. nominal, on the training ship Shaftesbury, moored off Graves, Essex, in accordance with the specification prepared by the chief engineer; and that tenders be invited from Messrs. Robey, of Lincoln, Messrs. Marshall of Gainsborough, and Messrs. Davey, Paxman, & Co., of Colchester, for executing this work. London County Council School of Marine Engineering, Poplar (initial equipment and furnishing of the classrooms, offices, physical and chemical laboratories, and lecture theatre). H. Bouneau ... £283 5 11 London School Furniture Co.* ... 72 10 0 Bartlett & Son* ... 17 0 0 Angus & Co.* ... 25 15 0 Sheelbred & Co.* ... 15 12 6 £415 4 2

LONDON.—For electric light installation, at the new sub-station in course of erection in Burdett-road, E., for the London County Council:—

L. Sunderland & Co.	£147 0	Donnison, Sillem & Co.	£130 0
O. Clark & Co.	145 0	W. H. Johnson ..	125 5
G. Weston & Sons	139 10	National Electric Construction Co., Ltd., 34, Victoria-street, S.W.*	124 15
A. H. Marshall & Co.	138 10		
F. J. Colby & Co.	137 10		
Durrell & Co.	131 13		

NETHERNE.—For the superstructure of the Netherne Asylum, for the Visiting Committee of the Surrey County Council. Messrs. George T. Hine & Co., architects, Westminster. Quantities by Mr. L. A. Francis, 8, John-street, Adelphi, W.C.:

Knight, Kirk, & Co.	£266,769 1	J. Howe & Co.	£238,106
J. Mawlen & Co.	261,539	Greenwood ..	233,444
G. Froilone & Sons, and Colls	238,000	H. Lovatt ..	229,302
Holland & Hannen ..	241,292	W. Meas & Sons	226,850
Poser & Dieckee	239,532	H. Willecock & Co.	225,260
H. Holloway ..	235,595	C. Wall ..	223,625
		J. Bowen & Sons, Birmingham*	219,797 1

OXFORD.—For erecting eight cottages in Henry-road, for the Co-operative Society. Mr. W. M. Gray, architect. Quantities not supplied:—

G. Money & Son; £3,467	G. Innes & Son ..	£2,180	
J. Simms & Son ..	2,800	J. Woodbridge, Oxford Co-operative Builders ..	1,400
W. G. Co.	2,300	Organ Bros.	1,230
Organ Bros.	2,200	E. Kimber & Son ..	1,060
* Two estimates, inclusive. Four houses and eight cottages.			

OXFORD.—For erecting four houses on the Batley-road, for the Co-operative Society. Mr. W. M. Gray, architect. Quantities not supplied:—

G. Money & Son ..	£1,167	J. Woodbridge, Oxford Co-operative Builders ..	1,400
J. Simms & Son ..	1,360	Organ Bros.	1,230
* Four houses and eight cottages inclusive.			

PRESTON.—For new County Court office:—

A. White & Sons ..	£2,630 19 11	P. Pins & Baines ..	£2,075 0 0
W. White ..	2,300 0 0	T. W. Bailey ..	2,040 11 8
J. Cartmell & Sons ..	2,250 15 0	T. Croft & Sons Ltd.	1,972 0 0
J. Wainsley ..	2,200 0 0	D. Tullis & Sons*	1,960 0 0
J. Christian ..	2,153 0 0		

RICHMOND (Surrey).—For erecting a new board-room and offices at Parkshot, for the Guardians. Mr. E. J. Partridge, architect, Bank-chambers, Richmond:—

W. J. & A. Long ..	£7,240 0	W. Johnson & Co., Ltd.	£5,984 0
Potter Bros. ..	6,498 0	Wisdom Bros.	5,928 0
J. W. Brooking ..	6,373 0	Spencer, Sauty, & Co., Ltd.	5,900 0
Martin Wells & Co., Ltd.	6,300 0	J. & M. Patrick ..	5,753 0
W. Wallis ..	6,247 0	Foster Bros.	5,745 10
R. T. Hurbes & Co., Ltd.	6,120 0	B. E. Nightingale ..	5,665 0
W. J. Renshaw ..	6,046 0	Speechley & Smith ..	5,625 0
Thomas & Edge ..	5,997 0	Kerridge & Shaw ..	5,538 0
The General Builders, Ltd.	5,997 0	G. H. Gibson ..	5,469 0
S. N. Soole & Son ..	5,990 0		

SHEFFIELD.—For erecting classrooms, etc., at the Carbrook Council School, for the Education Committee. Mr. H. L. Paterson, architect, 19, St. James's-street, Sheffield:—

Henry Boot & Son, Sheffield*	£2,903 0 0
New Infant School, Green-street, Walkley, Sheffield.	
T. Roper & Son, Sheffield*	£5,418 5 10

SANDAL MAGNA.—For kerbing works and pipes and gullies, Sandal Magna, near Wakefield, for the Urban District Council. Mr. F. Massie, F.S.L., Council Offices, Sandal:—

Threlkeld Granite Co., Keswick, Cumberland* ..	£107 5 0
Potterby & Co., Anchor Foundry, Wakefield* ..	8 18 6
Naylor Bros., Denby Dale, near Huddersfield* ..	56 9 5
T. Kendall, Ltd., Shipley* ..	23 6 8
Farrar, Ltd., Brighouse* ..	179 3 1

TEMPO (Ireland).—For erecting a parochial hall:—

J. Bloomfield, Brookeborough, Co. Fermanagh	£215
---	------

TRURO.—For 750 tons of road metal for the City Council. Mr. Measham Lea, City Surveyor, Truro:—

St. Keverne Stone Co., Port-howstock ..	500 tons at 4 0
J. Leverton, St. Erme* ..	200 " 5 10
J. Higgins, Truro* ..	100 " 6 0
J. Runnalls & Sons ..	8 3

WIMBORNE.—For erecting a small masonry bridge, for the Llandaff and Dinas Powis Rural District Council. Mr. J. Holden, engineer, 20, Park-place, Cardiff:—

H. Fraser ..	£195 5 6	C. Williams, W. Cox ..	187 6 0
J. Ashley ..	157 15 3	Whitechurch, Glam.* ..	£121 12 10
C. Osmond & Son ..	135 3 0		
G. F. Dwdney ..	£130	W. Baker & Co., Newport, Mon.* ..	£100

W. H. Lascelles & Co.

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Asphalte.—The Seyssel and Metallic Asphalte Company (Mr. H. Glenn), Office: Poultry, E.C.—The best and cheapest material for damp courses, railway arches, ware floors, flat roofs, stables, cow-sheds and 1 rooms, granaries, tun-rooms, and terraces.
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The London Building Act Amendment.



CONSIDERING the very long period during which the old London Building Act was left untouched, before it was superseded by that of 1894, the fact that the latter

is already about to receive what promise to be numerous and important amendments indicates that there is a much greater activity of mind in regard to such points than existed during the previous half century. The Report of the Building Act Committee of the County Council states that it was originally intended merely to bring in a Bill to amend the 1894 Building Act in relation to provision against danger from fire. The Council however came to the wise decision that if a Bill to touch the Act were to be brought in at all, it would be better to make this the opportunity for drafting and carrying all amendments to the Act which seemed to be required; and accordingly the previous reference to three Committees in relation to provisions against fire was rescinded, on the understanding that the Building Act Committee would proceed with the preparation of proposals for securing all the amendments. The Report of that Committee, which was partially discussed at last Tuesday's meeting of the County Council, was printed in full in our last issue (pages 489 to 491 ante). As will be seen, the Committee have not yet published the actual wording proposed

for the altered portions of the new Act; they only detail the points in regard to which they propose alteration; so that a great deal yet remains to be done before any Parliamentary action can be taken.

The first of the suggestions given under "details" in the Report includes the proposal "to define certain terms not at present defined"; there is no suggestion as to what these are, but it is to be hoped that it is at last intended to define "building" and "structure," words which are used in the existing Act as if they had a different meaning, but of which neither is defined. To pass an Act to regulate buildings, and to omit to define what legally constitutes a "building" is certainly one of the most extraordinary oversights ever made in an Act of Parliament, and it seems amazing that it should have been allowed to pass. It is also proposed in the next paragraph of the Report to amend the provisions as to what constitutes "the commencement to form or lay out a street," a reform also urgently demanded in the face of the extraordinary wording of section 8 of the present Act, wherein it is stated that certain acts constitute a commencement to form or lay out a street, unless the person concerned shall have done any of these acts "for some purpose other than that of forming or laying out a street"; so that, as far as the wording goes, he has only to affirm that he had "some other purpose," to put himself outside the Act; a laxity of definition almost as inconceivable as the omission to define "building." Among the proposed alterations in regard to streets we are

glad to see that it is proposed "to enable the Council to require a greater width than at present" "in the case of new streets or the adaptation of ways to streets"; a rather vague sentence which, it is to be hoped, amounts to a confession that the limits of street width in the present Act are too small. It is also proposed to make universal the requirement, at present absurdly limited to "dwellings for the working classes" (by the way is the new Act to define "the working classes" ?), that a dwelling-house within a distance of 20 ft. from the centre of the roadway shall not be erected to a height greater than the distance to the nearest external wall on the opposite side of the street. But the most satisfactory point in reference to this part of the subject is that it is intended to provide that in new streets "no building shall exceed in height the distance between buildings on opposite sides of the streets." That is what has been wanted all along; and that will put an end to the absurd anomaly in the existing Act, which we pointed out at the time it was passed, that with a street 49 ft. in width the height of buildings is limited to the width of the street, but that the moment you get to 50 ft. wide you may carry the buildings to a height of 80 ft. But why not go a step further, and apply the same rule to new buildings erected in an old street? Private owners would grumble, no doubt, and it might be a case for compensation, but it would unquestionably be for the public good.

The proposed alterations in regard to building line seem also to indicate that the authorities are at last waking up to the

fact that the contemplated widths for new streets in the existing Act are too narrow. It is now proposed that the buildings in any new street not within two miles of St. Paul's shall not be nearer to the centre of the road than 35 ft. without consent; and that the Council shall have power to define a building line in any important street "not being at any point more than 75 ft. distant from the centre of the roadway." This is a change indeed from the provision of the existing Act, that the Council should have no power to require a greater width than 60 ft. for any street. It is proposed also to provide that on payment of compensation the Council may require any building or structure projecting beyond their defined building line to be set back.

The suggestions as to the naming and numbering of streets seem to be redundant in some points and deficient in one very important one. It seems contemplated that the Council should now take the initiative in street naming, instead of merely exercising a veto over any name they may disapprove of; but they already have power (section 34) to alter the name of any street to any other name they think fit. Section 33 already provides that the local authority is to paint or affix the name of a street, so that we do not see the point of the new suggestion in the Report "to require the local authority and not the owner to set up the new name whenever the Council finds it necessary to change the name," etc. But what we do not see in the Report, and should have wished to see, is some decisive provision for the compulsory naming of streets at every corner and on a definite system, as is done in Paris. The existing Act uses the vague phrase that the local authority "shall and may" cause the name of every street to be affixed "on a conspicuous part of some house or building at or near each end or entrance to such street, or some other convenient part of the street." This is not precise enough; it is at the entry to the street, at the corner of each street, that we want to see the name. But even as it is, it is disgracefully neglected by local authorities. A man who goes into any neighbourhood in London with which he is not familiar, is likely to have difficulties in finding the street he wants. He will probably pass corner after corner where there is no name to the street, and where, if the names are written up, they are in all kinds of different forms and lettering; no rule is followed. What we ought to see in the amended Act is some such clause as this:—

"The Council will decide upon the best and most convenient form of lettering for the names of streets, and on the material and the manner of fixing the names; and the local authorities are bound to adopt this general model, and to affix names, designed and executed on the same model, at the corners of all streets in their district; and the local District Surveyor shall be considered responsible for carrying out this regulation."

If some such clause as this were inserted in the Act, and its operation insisted on, we should at last have all our London streets fully and legibly named and labelled, in the same form and lettering, in place of the present partial and haphazard lettering, the result merely of carelessness and want of system, and which is a discredit to London.

The suggestions in regard to open

spaces in connexion with buildings, though rather vaguely expressed, obviously point to an intention of enlarging the scope of these provisions, one sentence in fact running—"To provide that open spaces behind houses shall be larger than the present Act requires"; which is certainly in the right direction, for the open space provision is small enough at present. There is a want of logical clearness and decision in some of these paragraphs; e.g.:—

"To require the space at the rear of all buildings used solely for dwelling purposes, in streets laid out before the commencement of the Act of 1894, to be provided at the level of the adjoining pavement."

This is just what the existing Act provides (section 40); the only real difference being that section 40 restricts the requirement to domestic buildings erected since the Act of 1894, while it is now proposed to make the provision retrospective, and apply it to buildings erected at any time before the 1894 Act. It would surely have been simpler and more sensible to state it that way, instead of bringing in what at first sight seems to be a new proposal. Among other proposals are those for making a minimum provision for ventilation to an enclosed court; to omit from section 45 the second paragraph (allowing a court of which the greater dimension is not more than twice the lesser one, if equivalent in area to the required space); and to apply the third paragraph of the same section to any habitable room, whether above or below the level of the ground story. This is in the direction of common sense; why the existing paragraph was not to apply to windows in ground floor and basement is one of the numerous little puzzles of the existing Act; one presumes there was some motive in the mind of the framers of the existing paragraph; but it is difficult to understand what it could have been.

The proposals for providing against danger from fire may seem rather numerous and drastic, and we understand that the report of them has already raised alarm in the minds of property-owners and intending building-owners, but we do not see that there is anything more than reasonable in them, considering the terrible examples we have had of the danger from inadequate construction and insufficient means of exit in city fires. The greater proportion of them deal with the provision of means of escape, but there are one or two important provisions in regard to structure. Floors of wooden joists with concrete pugging are now to be recognised as fire-resisting, which is a concession, though a perfectly right one; an exception being made in regard to floors over any room in which a furnace is fixed. The lesson from the Whitechapel fire has evidently led to a provision that windows of warehouses within 30 ft. of openings of other premises (should not this be "of premises opposite"?) shall be protected in a prescribed manner to prevent the spread of fire. Another provision that we are very glad to see proposed is that "boarding and panelling shall be so fixed as not to allow of any space between it and the wall," and such work is to come under section 145 of the present Act, viz.: work of which notice is to be given to the District Surveyor. Though this comes under the head of provisions

against fire, in reality it is a salutary provision for other reasons. We have always been of opinion that hollow spaces that no one can get at are most undesirable in any building, from a sanitary well as from a fire-protection point of view.

Under the head of "construction" a general paragraph promising to provide for and regulate the use of iron and steel construction in buildings was almost a matter of course; no details are as yet given. The proposal to increase the minimum height of "habitable" rooms by 6 in. will no doubt meet with opposition, as unnecessary, but we entirely approve of it. In regard to habitable rooms over stables there is a proposal to extend the provision as to floors, rooms over coach-houses and barn rooms; this seems unnecessary unless such rooms communicated with the stable, which they never should. Indeed, it seems to us that 70 *e* of the existing Act provides all that is necessary. When reviewing the existing Act, we asked why the wall between the staircase and the stable must be of brick, and concrete would be just as effectual. In the new proposal there is the opposite mistake, and only concrete is specified for both. It should be "brickwork, cement or concrete." Paragraphs of this kind seem to be drafted without sufficient thought as to facts and wording. We note that in regard to certain points of construction (of what nature is not indicated) there is to be a right of appeal to the superintending architect against the judgment of the District Surveyor, a very benevolent provision. An architect may have a new method of construction which is perfectly sound, which a surveyor may condemn merely because it is unusual or against the letter of the law.

To provide for horizontal separation of properties as an alternative to separation by party walls is a step with the increasing use of solid floors, and constant subdivision of properties, tenements within the same general exterior structure, renders both possible and desirable.

Among the "Miscellaneous" provisions is one very important one, which has long been called for; to enable the Council to sanction the cubical contents of buildings to be used for trade or manufacture, "or for any purpose which the Council may think it expedient to permit," being of such dimensions as the Council may think necessary. The restrictions of section 75 in the existing Act are vexatious at a time when buildings are so frequently being required of a larger extent for manufacture, storage, and the safety of such buildings really depends not so much on the limit of size as on their manner of construction; and a special provision to empower the Council to require the maintenance of proper arrangements lessening danger from fire in buildings of large cubical extent" is suggested in another portion of the Report, which probably has reference to the paragraph before named, though the two are under different headings: they should have been placed together. And the paragraph—"to provide that where an building is taken down or destroyed"

more than half its cubical extent, the remaining portion of the building shall be demolished or made in all respects to conform with the provisions of the Act"—seems only another way of expressing what is already provided for under "Definitions" in section 5 of the existing Act, which provides that "any building which has been taken down for more than half of its cubical extent and re-erected or commenced to be re-erected wholly or partially on the same site after the commencement of this Act" comes thereby under the definition of a new building," and is therefore subject to all the provisions affecting new buildings; the powers to deal with the case are sufficient already; the new paragraph superfluous. Under the same heading, "Miscellaneous," is a provision "to revise the schedule of fire-resisting materials." This is undoubtedly necessary, and we should recommend that the amended Act should include the power to revise the schedule from time to time at the discretion of the Council, since new fire-resisting materials are frequently brought forward.

The proposal to give the Council powers to introduce the system of paying District Surveyors by salary, if they wish to do so, will no doubt arouse some opposition, but in itself it is a move in the right direction. Human nature being what it is, it is almost impossible that there should not be aroused, in some cases at all events, a disposition on the part of the Surveyor to lie in wait for faults, to be "extreme to mark what is done amiss," when every fault that can be established is something in his own pocket; and even where he is quite free from such a reproach, he will not be thought to be so by the people whom he fines. The objection to salaries is that in most districts they cannot be high enough to attract the best class of men, and the Surveyor is to be debarred from private practice; and there lies the great mistake of the County Council, which they have now an opportunity to correct. When the District Surveyorship was an appendage to private practice, the Council had some of the leading architects of London looking after the construction of new buildings; men whose names and position had weight in themselves. By abolishing the system they deprived themselves of the services of this class of architects and surveyors. Their wisest course would be to take this opportunity of restoring that state of things, and throwing open the District Surveyorships to men in private practice. In that case the salary system could be established without extravagant cost, since a salary which would be inefficient in itself to attract a man in a high position may very well be accepted of such a man as an addition to his private professional income.

It is proposed to increase the numbers of the Tribunal of Appeal to five; one member (not a member of the Council) to be appointed by the Council, the fifth to be chosen by the other four, and to be a Barrister of not less than ten years' standing, who shall be chairman. Why a lawyer should be supposed to be a better chairman of the Tribunal than an architect or a surveyor we fail to see. It is very well to provide that a lawyer

should be a member of the Tribunal—his assistance would no doubt often be most useful; but why make him *ex officio* chairman? A still more surprising proposal, and one that we cannot understand in the least, is that no "architect or surveyor practising in London shall be eligible as a member of the Tribunal." Has there been any experience in regard to the action or judgments of the Tribunal hitherto to give any colour or excuse for such a provision? It appears to us to be a preposterous one. Who is likely to be so well able to understand the points or the special difficulties of a case in London building, an architect or surveyor familiar with work in London, or a provincial man who is familiar with work under local conditions only? Or is it intended that architects and surveyors are not to be members of the Tribunal at all? The proposal appears to us not only to be absurd and unalled for, but to imply a kind of insult to the whole profession in London, as if there were no men among them who could be trusted to act with impartiality. We shall be surprised if such a proposal is sanctioned.

NOTES.

This subject was brought forward for discussion at a meeting of the London Chamber of Commerce a few nights ago, when Sir John Jackson and other speakers expressed themselves in favour of the construction of the tunnel. None of these gentlemen appeared to anticipate any serious difficulty in the execution of the work, but this is a view which, in the present state of knowledge as to the precise condition of the strata for the entire length of the proposed route, we are not prepared to endorse. Circumstances already ascertained seem to point to the possibility of a serious fault in the stratum of clay upon which the practicability of the project largely depends, and the great depth of the workings would render impracticable the employment of compressed air for the exclusion of water in the case of any fault being discovered in mid-channel. Moreover, the ventilation of a tunnel more than 20 miles in length would constitute a most serious and difficult problem, for which a satisfactory solution could scarcely be found without involving the establishment of two or more island ventilating shafts in the open sea. We have already pointed out in a previous "Note" the disadvantages of long tunnels from the hygienic standpoint, and experience of subways in the metropolis does not encourage confidence in tunnel engineers as experts in the practice of ventilation.

TWO PAPERS on this important subject, read before the Institution of Civil Engineers last week, were further discussed on Tuesday last. The first paper is mainly directed to the question of constituting a single authority for the purpose of dealing in a comprehensive manner with the entire coast-line of England and Wales. We entirely approve of the proposals made by the author,

and feel sure that the evils arising out of inaction in some places and ill-advised action in others can only be combated by properly organised efforts instituted with due regard to the requirements of all places on the seaboard. Our own sporadic methods and the general indifference of our Government stand in strong contrast to the businesslike manner in which coast protection is conducted and regarded in Holland and Belgium. In this connexion we may mention the curious differences existing between theory and practice in England and Belgium. In this country the Government claims absolute authority over the foreshores, but does nothing for their protection, except in a few special cases. On the other hand, the Belgian Government, although accepting no responsibility whatever, devotes large sums of money to, and takes great practical interest in, defensive works. The second paper, by Mr. E. R. Matthews, is of more limited interest, being devoted principally to the effects of erosion on the coast between Bridlington and Spurn Head. Still, it has the effect of showing the enormous proportions of the work, and the difficult character of the problems, that would be involved in a scheme for safeguarding the entire coast-line. For instance, the author is of opinion that the protection of the whole Holderness coast would require an expenditure of about 1,250,000*l.*, while the value of the agricultural land saved during thirty-three years would not be more than 34,000*l.* These figures make clear the fact that owners of land in the immediate vicinity of the sea cannot be expected to bear more than a small part of the cost if exceptionally heavy outlay should become necessary. No doubt the case cited is exceptional, and the estimate may be unduly high, but it serves to suggest that protective works ought to be treated primarily from the national standpoint.

At a meeting of the Council of Ministers last month it was decided to recommend the Khedive to authorise the raising of the Assouan Dam, and the construction of a barrage—similar in design to that of Assiout—near Esneh, a town of some 15,000 inhabitants between Assouan and Assiout. Both of these undertakings are included in the new irrigation programme which was fully discussed in our columns two or three months ago. While referring to this subject, we may mention that by a Khedival decree Sir William Garstin has been promoted from the position of the Under-Secretary of State to that of Adviser to the Khedive in Affairs Relating to Public Works, with a status equal to that of the Financial and Judicial Advisers. Knowing the thoroughly conscientious and able manner in which Sir William has laboured for years past in the endeavour to prepare the way for the complete engineering control of the Nile, we heartily congratulate him upon the recent official recognition of his invaluable services. He has a special claim to the thanks of our readers because of the sympathetic interest he has always displayed in the ancient monuments of Egypt and for the measures

The Channel Tunnel.

Egyptian Irrigation Works.

he has invariably authorised, when within his power, for their preservation and repair.

Sub-Contractors and Compensation. THE case of *Evans v. Cook*, decided by the Court of Appeal on the 10th inst., merely determines an important point of practice. The respondents were builders who were constructing a workhouse infirmary, and had employed sub-contractors to do the plastering. One of the sub-contractor's men sustained an injury, and the respondents, by agreement, had paid him weekly compensation. The respondents then, under section 4 of the Act, claimed an indemnity from the sub-contractors, who brought their insurers in as third parties to the action in the High Court. It was contended that the respondents had no right to bring an action for indemnity in the High Court, but could only proceed under the Workmen's Compensation Act by arbitration. The Court held that the provisions as to arbitration contained in the Act apply only where there is a question as between the workman and the employers or undertakers as to the amount of the compensation, but that they have no application where, as in this case, that question has been settled by agreement.

Workmen's Compensation. In the case of *Pattison v. White & Co.*, decided by the Court of Appeal in August, the question was raised as to the meaning of the words "on, in, or about" in connexion with an "engineering work." The employers were contractors constructing a light railway for the Corporation of Darlington. The claim made upon them was in respect of the death of a carter who was engaged in bringing sand to the works from a pit distant $3\frac{1}{2}$ miles from there. This man was killed by accident at a spot $2\frac{1}{2}$ miles from the works. On his behalf it was contended that in connexion with the first half of the definition of "engineering work," that is to say, "any work of construction, alteration, or repair of a railroad, harbour, dock, canal, or sewer," the words denoted the labour bestowed, and not the works themselves, and that the idea of "physical contiguity" to the works had no application. This contention was negated on the authority of the cases, *Chambers v. Whitehaven Harbour Commissioners* (1899, 2 Q. B., 132) and *Atkinson v. Lumb* (1903, 1 K. B., 860). In this last case it may be observed that the man was injured when working some 500 yards from the works—the construction of a reservoir in which machinery had to be employed—and he was held to be within the physical area and entitled to compensation. The Departmental Committee have advocated the abolition of this idea of physical contiguity as attached to compensation in the employment and the above cases well illustrate the necessity for reform. At what particular point between the quarter of a mile denoted in *Atkinson v. Lumb* and the $2\frac{1}{2}$ miles in the case under consideration does the workman pass from the protection of the Act? It is obviously inequitable that he should do so at all if his employment remains the same.

Elementary and Secondary Schools. A PAPER on "The New Education Code and the Report of the Mosely Commission" was read by Mr. W. Osborne Smith before the Sanitary Institute last week, and is in the main a critical commentary on the Board of Education's rules for the planning of elementary and secondary schools. Mr. Smith thinks that "in most cases" it is "quite unnecessary and undesirable from the point of view of health and supervision" that the closets of elementary schools should be, as the rules require, "at a short distance and completely disconnected from the school." We should say that "from the point of view of health" the rule errs, if at all, on the safe side, and that it is not wise in most cases to place within the school groups of water-closets and urinals for the use of young and irresponsible children. We have greater sympathy with Mr. Smith's remarks on the importance of sunshine in class-rooms, but, as to the relation of this to the central hall type of plan, we may note in passing that, if the axis of the central hall is placed due north and south, or approximately so, the class-rooms at the sides will not be entirely sunless. Other critical remarks refer to floor space, ventilation, the spacing of hat-and-coat hooks, single and other desks, and to various details of construction. Very little is said about the discoveries of the Mosely Educational Commission in America, but the paper as a whole is a sane and useful contribution to the literature of an important and interesting subject. It would have been still more valuable if it had been longer.

Preservation of Stone. IN a letter in the *Times* of the 15th inst., Mr. Thackeray Turner, Secretary to the Society for the Protection of Ancient Buildings, draws attention to the decay of the stonework of many of our ancient buildings, and concludes (we think rightly) that more damage is done by the corrosive gases and vapours evolved from burning coal than by rains, winds, and frosts acting in the absence of coal smoke. To arrest this decay Mr. Turner and his committee advocate the use of lime-wash, the lime-wash to be repeatedly applied to the face of the stone. For reasons which are obvious to all who have any chemical knowledge, lime-wash is very inferior to baryta-wash as a preservative for calcareous stones, and we think the process adopted by Professor A. H. Church for preserving decayed stonework in the Chapter House, Westminster Abbey, is much preferable to that advocated by Mr. Turner. This process consists in first cleansing the surface of the stone with the aid of an air-blast, and then, by means of a pneumatic diffuser, injecting a saturated solution of barium hydrate into the pores of the stone. The injection is repeated several times. By the use of barium hydrate instead of calcium hydrate (lime-wash), sulphate of barium instead of sulphate of lime is eventually formed in the pores of the stone for a distance of several inches from the surface. Since sulphate of barium is practically insoluble in rain water and in dilute acids, whereas sulphate of lime is distinctly soluble, the advantage of using baryta-wash instead

of lime-wash is evident. Calcium sulphate has, moreover, a greater tendency to cause exfoliation of the stone. The interested in the preservation of calcareous stones will find much valuable information in the reports of Professor Church on the treatment of the decayed stonework in the Chapter House, Westminster Abbey, to the First Commissioner of H.M.'s Works, dated May 28, 1903, and November 18, 1903, respectively.

Institution of Electrical Engineers. MR. ALEXANDER SIEMENS gave his presidential address at the opening meeting of the Institution of Electrical Engineers last week. He began by discussing the relations between capital, labour, and management of works. He laid great stress on the ill-advised action of workmen's trade unions in restricting output of works, and pointed out that the effect of this action was generally to throw more and more workmen out of employment, due to the fact that with the price of an article rises owing to restricted output then a number of consumers begin to do without it, and the demand for it diminishes. The converse of this is also true, namely, that when the price of an article is lowered the demand for it increases rapidly, so that, as a result, more workmen are employed. Gas lamps were first made by a few highly skilled workmen and sold at 25s. each. Naturally the demand for them was small. At the present time, when labour can be had for a shilling each, thousands of skilled workmen are employed making them, and tens of thousands of unskilled workmen are employed tending the machinery, packing lamps, etc. Mr. Siemens said that times of depression the only remedy workmen's representatives would suggest was "restricting the output." It could not see that lowering the wages thus lowering the cost of production would increase the demand, and so provide labour for more workmen. It seemed to us, however, that Mr. Siemens looked upon the question too much from the employers' point of view, and something could be said in favour of workmen's contention that this style of reasoning would lead to the conclusion "that everybody would find employment if no wages were paid at all!" In concluding his address the President made a strong plea in favour of the universal adoption of the metric system. He pointed out that the feat in electrical measurements which has contributed most to the rapid rise of the industry was that all countries adopted the same units of measurement. Some prominent engineers profess to have trouble to work with metrical units, and to be found that they could not work as quickly and easily with them as with their accustomed units. In his opinion, their conclusion on this particular matter is about as trustworthy as that of the man who tries to skate, and, after his first attempt, says that he has proved that you can skate faster than you can walk.

King's Ferry Bridge, Sheppey. AN interesting example of a modern bridge construction is to be found in the highway and railway bridge over the Swale at King's Ferry, between the

Sheppey and the mainland of Kent. Its structure is of the Seberzer rolling-t type, and the only other bridge of the kind in this country is one at Barking, Essex. The bascule, providing for the passage of vessels with fixed masts, is an enlarged end of curved form which, when the span is being opened, is rotated so as to come into contact with a track forming a kind of rolling ledge. This type of construction has been very largely employed in the United States, and its simplicity is certainly a great recommendation.

The Mystery still surrounds the fate of the Plummer Tower on the wall of Newcastle.

August last we drew attention to the threatened destruction of this ancient landmark, and to the strange reticence played by its owners as to the actual terms of negotiations then believed to be pending with regard to its disposal. Now appears from a report of the Town Improvement Committee that a serious proposal is before the City Council purchase and remove the tower for the purpose of widening Croft-street. By this means let the authorities buy this historic relic with a view to its preservation, but they should not be allowed to take away with it for a comparatively important street improvement that could easily be effected by some alternative means.

The new entrance gates and railings, bearing the heraldical coronet, crest, and motto of the house of Cavendish, which have been erected at the ends of Burlington Arcade, are the work of Messrs. J. & Smith, of Brierley Hill, Staffordshire, and replace the old and more laboursome iron-work. The arcade, built by Samuel Ware's designs, was opened March 20, 1819, having been erected by Lord George Cavendish (Earl of Burlington) upon the Duke of Devonshire's land to serve as a screen between Burlington House and its gardens and the houses in Bond-street. Lord George wanted to build a similar screen along the east side of his property in that part of Piccadilly, and the tenants of the Albany successfully resisted the project. Since the demolition of the elder Sydney Smirke's Exeter Change leading out of Wellington-street into Catherine-street, and for the building in 1862 of the Grand Music Hall, and of W. Young's other Arcade for Messrs. Coutts & Co.'s new bank, the arcade which was built and Repton built in 1816-19 along the west side of the Haymarket Opera House, the Burlington Arcade, and its adjacent neighbour in Old Bond-street remain as the only covered passages with vaulted roofs, being thoroughfares, after their kind in London; the two in Ludgate-hill have no features of an architectural character.

A CONSIDERABLE number of the works exhibited at the New English Art Club suggest the idea that the gallery is the work of the pavement artist. There is hardly a work in the gallery which we could call really a picture in the full sense of the word. Mr. Mark Fisher's "A Garden Walk" (50) is an exception,

though it is hardly one of his best works. Powerful sketches there are, like Mr. Rich's "In Danny Park" (20) and "Near Hurstpierpoint" (34); Professor Fred Brown's "A Valley" (102) and "The Edge of the Park" (112), and some others. There is a large study for a portrait by Mr. Furse, which is of interest in every sense; and two or three hasty studies for pictures by Mr. Sargent, which of course are also of interest; but are such rough studies, for the artist's own use, things for exhibition? There are qualities in Mr. Wilson Steer's "Twilight" (54), but in his "Storm" (58) we are again reminded of the pavement artist. Mr. Roger Fry treats architectural subjects well on a small scale, and his "Christ Church Library" (6) shows the texture of stone work, in contrast with an architectural subject next to it (7) where there is no texture at all, and the bridge might be made of mud. Texture seems to go for nothing with some even of the best exhibitors here; Mr. W. Rothenstein's "Deserted Quarry" (62), for instance, is a powerful composition, but the quarry might be cut out in cheese, for any special idea of surface that we get. As to some of the things exhibited—formless dabs of colour which we are asked to accept as architectural subjects; heads and half-lengths of personages apparently selected for their repulsive appearance, or made repulsive by the way they are treated, we do not care to particularise; but it is melancholy to see such things put forth as "art," and supported, as they are in some of the daily papers, by people who call themselves "art critics."

Drawings by Mr. Harry Goodwin. AFTER the New English Art Club, it is refreshing to look at a set of water-colours, like the "English Towns and Swiss Mountains" of Mr. Harry Goodwin (Messrs. Dickinson's Gallery), which are really beautiful and delicate art work, and are finished. All are good; among those we may specially mention are "A Pool under Monte Rosa" (30); "Au Alpine Footpath" (38); "The Calm before the Storm, Lake of Geneva" (41); "Morning on the Old Bridge Lucerne" (57); and "The Old Church, Maidstone" (17). We may add that where Mr. Goodwin introduces architecture in his composition it is always well and conscientiously treated.

THE SOCIETY OF PAINTERS IN WATER-COLOURS.

THE first drawing numbered in the catalogue of the Society of Painters in Water-colours is an architectural one of the most delicate beauty and finish; that of "The Great Church, Dordrecht" by Mr. Reginald Barratt. There are few artists of the day who paint architecture like this, combining accuracy of draughtsmanship with a feeling for colour and artistic effect; this is a real picture, which at the same time gives a perfectly satisfactory representation of architectural detail and material. Mr. Barratt's other drawings are all good, but none equal to this, and there seems to have been a little oversight in the view of the angle of the Ducal Palace (135): "A Summer Evening, Venice", for one can hardly imagine that the piers of the two front arcades, on the side furthest from the spectator, could from any standpoint be all hidden behind the nearer ones on the return side, and the impression is produced that the arcades towards the front are missing. If the point of view has been specially selected so as to give a clear vista through

the arcades in this way, it is not the best for the effect of the building, which looks as if it wanted solidity. Architectural drawing which is simply architectural and not pictorial is illustrated in Mr. Rooke's large interior "The Choir of Le Mans Cathedral" (57); irreproachable in drawing and perspective, but totally wanting in sentiment and, we must say, deficient in texture and in the expression of different planes of distance, the masonry of the near piers not appearing to stand out in any way from that of the aisle wall in the rear. This is architectural drawing, but it is not a picture, in the full sense of the word. In Mr. R. W. Allan's "Amiens Cathedral" (43) we have the other extreme, in which the building is used for pictorial effect alone without the slightest attempt to indicate detail, the architecture being only shown in a collection of dabs with a wet brush. Here, of course, the artist was only aiming at general pictorial effect and not professing to paint architecture; but we think that architecture, if used as part of the material of a picture, demands a rather more decisive treatment than that.

How different this is with Mr. Albert Goodwin's pictures of cities, which, as we have before observed, are somewhat too dream-like in their delicacy of tint, but in which the buildings, though subservient to a general effect, are treated with most conscientious care, the smaller details being even, if we mistake not, lined in with a pen, before or after the brush-work. "Winchester" (37), with a rainbow resting on the cathedral, is an exquisite example of this class of the artist's work. In a more romantic vein is his fine "Sea Breeze" (80), a red sunset, a lonely shore, and waves, combining to make a gloomy poem which is very impressive. "Venice, from the Hebrew Cemetery" (15), is another work of the same poetic cast; Venice is only dimly discerned in outline through mist and cloud, seen from a foreground—

"By Lido's wet accursed graves,"

and with a very fine and effective treatment of a stormy sky.

A feature in the exhibition is the collection at one end of the room of four or five drawings, two of them large ones, by the late Mr. Arthur Melville, who, whatever one may think of his method, was an artist of real genius, and a great loss to the Society. He carried the system of painting by dots and dabs of colour too far, so that form is almost sacrificed for colour and effect; but he unquestionably achieved great brilliancy and brightness by this method of handling, and his drawing "The Green Minaret" (211), whether we are to regard it as finished or not, is one of the best things in the gallery. Among the more recent members Mr. Walter West more than keeps up the promise of his earlier appearances; "The Quakeress" (150) presents a lady in the costume of her sect, her long grey funnel-like bonnet on her knee, and with a head which is perfectly beautiful for finish of execution and refined character; the pencil study for the figure (202) is perhaps even more charming. The fine colour in the interior entitled "A Silken Cord" (27) also attracts one, though the figures are less interesting. As Mr. West likes to paint the costumes and surroundings of that period, he is a painter who might do something for the illustration of Jane Austen's scenes, so strangely neglected by artists. Figure pictures are generally less numerous than landscapes at the Society's exhibitions, but we should mention "The Watchers" (170), a very charming and suggestive composition by Mr. Anning Bell, which we like better than his larger work "The Garden of the Sleeping Beauty" (164), very much spoiled in a decorative sense by the ugly trellis in the foreground; since this is a purely ideal work, surely something more pleasing might have been invented as a foreground object. Miss Rose Barton's portrait of a child seated by a pond (293) is excellent, and still better her terrace and infantine children under the title "Grab" (63); she is always characteristic in her treatment of children. Mr. Rackham's grotesque bogie pictures are undoubtedly very clever, but we do not think that they are the things to include in a high-class exhibition. A very realistic study of a lobster is exhibited by Mr. Edwin Alexander (230); it is worth something to see the thing so well done, though it is only what the Royal Academy would class among "mere transcripts of the objects of natural history," and therefore inadmissible. Among landscapes not already mentioned

are two by Mr. Eyre Walker of the cliffs above Farringford (29 and 141) remarkable not only for their fine broad style, but for their great truthfulness to the scene, especially No. 29. "Mallerstang Edge" (129) is another by the same artist, who also, in "Ox-eye Daisies—Early Morning" (125) gives us a flat composition and a crowd of wild flowers, as well painted as his hill scenes. Mr. Colin B. Philip's "The Wild West Wind" (49) is a grand hill landscape in his best style. There are too many interesting landscapes even to mention all; among Mr. Robert Little's various drawings, all fine, that of "Crichtoun" (93) is grand in composition, and impressive in spite of its small scale. Mr. Thorne-Waite's "The South Downs" (30), with their rolling surfaces fainter and fainter in succeeding planes of distance, is a true representation of a landscape that, whether in reality or in painting, seems never to tire. Mr. Callow, whose architectural subjects have for many years, we confess, left us unimpressed by their conventional style, arrests attention by exhibiting two of his early landscape sketches, of which "Distant view of Bamboro Castle—sketched from nature 1843" (84) is exceedingly fine, and far more interesting than his present drawings of old street scenes. Mr. Callow should exhibit some more of these early sketches. Mr. H. S. Tuke, who generally paints boys bathing, on this occasion sends various clever sketches of shipping; Miss Mildred Butler has a splendid study of "Perennial Poppies" (301) flashing red against a background of dark foliage; also should we praise her "Gay Garden" (192) and her "Ramblers" (126), an admirable study of peacocks wandering in the fields, where they look curiously out of place; one always somehow associates peacocks with a formal garden and a balustrade. Among works with a particular and specialised kind of interest, we may note how decidedly Mr. Cameron's "Autumn on the Tay" (77) is an etcher's landscape, a composition which would come out better in etching and is hardly satisfactory as a water-colour; and how distinctly Mr. Louis Davis's "October Showers" (97) is a stained glass artist's landscape, which would work out admirably in that form, though effective and poetic also as a water-colour; and that Mr. Rackham shows, in his peculiarly delicate little picture "Sussex Farmstead" (226), a little gem of a drawing, that he can do something better than bogie-pictures; we should like to see more of this kind of work from him, instead of the jokes to which he has hitherto confined himself, and which are hardly worth the talent bestowed on them.

MAGAZINES AND REVIEWS.

THE *Quarterly Review* contains an article on "The Palace of Knossos," by Mr. D. G. Hogarth, and accompanied by a pretty large reproduction of the plan of the later Palace as excavated, drawn out by Mr. Theodore Fyfe, and stated to be the most complete yet issued. Mr. Hogarth remarks on the great advantage which Dr. Evans, as an explorer, has had in his previous knowledge of prehistoric archaeology and of local antiquities. While unquestionably the most important archaeological enterprise since Schliemann's, it has been carried out in a far more scientific spirit. The article is a learned and lucid summary of the main conclusions to be derived, or considered to be derivable, from the study of the work un-earthed at Knossos; and no better exponent of the subject could be found than Mr. Hogarth, unless it were Dr. Evans himself. But while it is unquestionable that his brilliant discovery has thrown quite a new light on early archaeology, not exactly Greek, but related to Greek development, we confess that we are disposed to take *cum grano* the complete historic scheme of earlier and later periods of "Minoan art," as it is now called, which has been formulated on the basis of fragmentary remains of art from one large building. Practical archaeologists and explorers, writing on these subjects in general periodicals, have things all their own way, for whatever conclusions they have come to cannot be refuted except by one of the small handful of people who have personally gone into the subject in the same manner. But those who have more or less to take statements on trust may certainly be allowed to think that, granting all the actual facts to be correct, too much is built on them and too great a demand made on our faith. And the artistic optimism of explorers is so remarkable. As in Mr.

Hogarth's article, so in nearly every archaeologist's description, the words "beauty" and "beautiful" dance before our eyes incessantly. Every jar that has a hit of pattern on it is "beautiful," and the fragments of painting and sculpture are spoken of as if they rivalled the work of the great period of Greek art. Now, we paid most careful attention to the Knossos exhibition at Burlington House some little time ago, but we saw little that was beautiful, though much that was interesting; as to the wasp-waisted figures with (apparently) metal rings round them, they are simply hideous. The historical interest of such a find is surely enough, without trying to persuade us, against the evidence of our senses, that a great art period has been un-earthed. The same number contains an article by Mr. E. E. Fry on "French Painting in the Middle Ages," really an article on, or suggested by, the recent exhibition of the French "Primitifs" at Paris. Mr. Fry is very well up in his subject, and has many suggestions to make in regard to the history of the period; but one almost requires a series of engravings or photographs of the works to follow the writer. The article will be interesting chiefly to those who visited the "Primitifs" exhibition. There is a suggestion, however, in regard to the relative value of mediæval symbolical painting and modern realistic art which is rather startling:

"We are now so familiar with the view that painting must follow the actual appearance that it is hard for us to realise how little in the year 1400 that necessity was apparent, how contradictory even it may have appeared to the essential aims of pictorial expression. Let us take two examples: one a circular and the other a diamond-shaped pane of glass in Chartres Cathedral whereon a hunting scene is depicted. The huntsmen, on whom are concentrated our imaginative sympathies, fill the left-hand angle of the diamond and extend across the centre of the pane; up the right-hand lower border run two stags, whose antlered heads fill the space between the horses' fore-legs and noses; while the space between the horses' fore and hind legs is filled with the pack of hounds. Here we have condensed into the smallest possible space the elements of the chase that appeal most to the imagination; and the appeal is made by the sympathetic and keen observation, the dramatic fitness, of every line. To the artist who drew it and the public which enjoyed it, the criticism that these images do not bear the same relations as they do in three-dimensional space would have appeared impertinent. Our other example shall be a faithful picture of a modern battlefield: a wide undulating stretch of country broken by tufts of bushes and stones, here the almost indistinguishable accent of dust which tells of the human spirit. Our thirteenth-century artist might complain that we have imposed limitations on our art which, in certain circumstances, reduce it to complete impotence."

That is ingenious, but we think fantastic; and besides, the comparison is hardly fairly made between a mediæval scene filled (in however conventional a manner) with figures and animals in action, and one in which hardly any figures are to be seen. Sergeant could paint modern field of battle scenes that held one breathless with interest; witness his "Napoleon at Marengo."

The *Burlington Magazine* devotes an article to the subject of the Sheffield plate in Lady Wolseley's collection. The article is written by Mr. Spink, who gives a description of the manner in which the process, invented by G. T. Bolsover in 1742, is carried out; the substance of the Sheffield plate being produced by rolling together a sheet of copper with a thinner one of silver. The technical description of the process in all its details is very fully given, and is of considerable interest. The illustrations of examples from the collection referred to, though not all of equal merit, are many of them most artistic and beautiful work. The notes on Mr. Blackborne's collection of lace are continued, the present article dealing with Rose Point lace, of which some perfectly fascinating illustrations are given, of course not so architectural in design as the example in the last article, reproduced in our issue of October 22 (page 417 ante). In an article on the new Titian at the National Gallery, called a portrait of Ariosto (a reproduction of which forms the frontispiece to the number), Mr. Roger Fry shows, we think, very good reason, by reproductions of medallion heads of Ariosto, to conclude that if the picture is Titian's, in which we see no improbability, the portrait is not that of Ariosto. One rather wishes it were, it seems to accord so well with one's conception of the author of the "Orlando Furioso." A writer signing himself "P. A." makes a curious attempt to provide a kind of rule for answering the question "What Modern Pictures are worth Collecting?" The perfect artist is supposed

to present five qualities in equal degree—Strength, Design, Insight, Drawing, and Colour—to each of which 6 marks, so to speak, are allotted. So that if the buyer find his proposed purchase is not up to 6 in any of the qualities, or only in one, and is as low as 2 in Insight and 1 in Strength, then we suppose he will say, with Browning's "Mr. Shdige, t Medium"—

"I'm warned—I let the trick alone this time." The misfortune is that there is no real criterion for either Strength or Insight, and hardly a Design; it comes to a matter, after all, of perception, not of rule; and the perception may as well be applied at once to the picture as a whole. These attempted mathematical estimates of qualities of art are perfectly useless, any practical purpose, though they may be amusing in a speculative sense.

In *Technics* several serial articles are continued. Part II. of "The Mechanics of Heat Electric Traction" is largely occupied with speed, distance, and time curves for various accelerations, and explanatory notes related to the diagrams. Mr. J. B. C. Korsholm in Part V. of "Electro-chemical and Electro-metallurgical Industries," describes the manner in which the electric furnace is applied in the production of calcium carbide, carborundum, artificial graphite, glass, and iron alloy. Professor J. A. Fleming, in Part IV. of "Electric Waves," directs attention to various devices suggested or employed for detecting the presence of an electric wave, and for utilising it telegraphically. Mr. Ibbotson discusses analysis of steel alloys and the determination of minor constituents of high-speed steel. Mr. Edser continues his simple explanation of "The Electro-Magnetic Theory," and Mr. Fiander Etchells contributes a further insight into the "Theory of Structural Design," devoting attention to steel pillar design.

A suggestion for the construction of a diagram of working loads will be found useful, and enumeration of special points for the consideration of the student is good. The writer is wise, however, to designate the well-known radius of gyration as the radius of "equilibrium." There is really no sense in departing from standard nomenclature, and the present only tends to confuse students. A short article on "Colour Photography," by Mr. Colin Bennett, gives an interesting account of the three-colour process, first demonstrated in 1861 by Mr. Clerk Maxwell, and briefly describes a recent method by which a colour-photograph may be obtained on paper. The latter represents the last step of progress in this direction, but as the writer says, a wide field remains for further serious work. An illustrated paragraph on "A Roller Attachment for T Squares" should interest our readers. "The Future of Electric Heating" is the title of an article by Mr. Edwin Edser, in which the writer, admitting that the chief drawback to the electrical production of heat is the low thermal efficiency of the process, argues that the convenience and perfect control of the electric heater often counteracts the initial disadvantages. We fully agree with many of his contentions, but the general application of electric heat must largely depend upon a very considerable reduction in the existing cost of current.

The *World's Work* contains a long article by the writer who signs himself "Home Cities" on the at present much vexed question of "Cheap Country Cottages." There are many illustrations, some of them of considerable practical and picturesque interest. Groups of three four-roofed cottages on one roof, on Mr. Clough's estate, look very well and provide rooms of a fair size, at 110s. dwelling; but the sanitary provisions are shown, and must form a small separate building perhaps grouped to serve for several blocks this must be a distinct addition to the expense. The Calway cement slab cottages are very well and we fear the attempt at "artistic treatment of corrugated iron," by having a gable trellis and creepers over it, does not do it to mitigate the case; one feels, in fact, sorry the creepers. The article is an interesting one, however, and may suggest new and practical ideas to some landowners who wish to improve the housing of their tenants on an economic basis. The same number contains an interesting article on "Dispelling Fog by Electricity," a clear description is given of Sir Oliver Lodge's experiments, and it is pointed out that the invention of the mercury vapour rectifier by Mr. Cooper Hewitt has made it possible to do these experiments on a commercial scale.

the present time experiments are being carried out by Sir Oliver Lodge at Birmingham University. It is suggested that shipping and railway companies should experiment with fog-dispelling apparatus. It would be perfectly feasible to disperse the fog round railway stations and in the neighbourhood of signals. It would also be possible to keep all the space within fifty yards of a ship clear of fog. We consider that the problem is one that will repay serious study.

EGYPT EXPLORATION FUND.

The eighteenth ordinary general meeting of this fund was held on Friday at Burlington House, W., by permission of the President and Council of the Royal Society.

The President, Sir John Evans, K.C.B., occupied the chair.

The Hon. Treasurer (Mr. H. Gruber) read his financial statement, which he said was the most unfavourable he had yet had to deal with. There had been a heavy expenditure, which had not been met by commensurate receipts, not only in the case of the Fund proper, but also in each of the branches—the Archaeological Survey and the Græco-Roman Branch. It was, however, on the Exploration Fund that the blow had chiefly fallen, and this had arisen from two causes—the necessity of sending out two expeditions and the diminution of receipts from America. The general balance-sheet showed that this year the assets of the Fund and its branches amounted to 3,061*l.*, against 4,914*l.* last year. At the present market price the invested capital of the Fund would only realise about 1,890*l.*, so that the assets of the Fund stand at present at about only 1,653*l.*

On the motion of Sir H. Smyth, seconded by Dr. Redpath, the report was adopted.

The Chairman, in the course of his annual address, expressed his regret that the financial position with regard to the undertaking of further excavations was in so unsatisfactory a character, and that the relations with their fellow workers and former well-wishers in the United States were so far from what they desired them to be. He hoped an appeal shortly to be issued would meet with liberal support, for they were in honour bound to renew their explorations at Deir-el-Bahari and to organise an expedition in which Professor Flinders Petrie might carry on his fruitful researches, not improbably this season, in a new field. The Chairman proceeded to deal with the work done by Professor Petrie on the site of the ancient Herakleopolis, some 60 miles south of Cairo, and that at Thebes by Dr. Edouard Naville and Mr. H. R. Hall. Referring to the construction of the mighty dam across the Nile at Assouan, which seemed destined to bring about a state of affairs in the Valley of the Nile above Assouan which archaeologists could not contemplate without a feeling somewhat akin to dismay, they must heartily deplore the deeper immersion of the lovely temples at Philæ and the probable effects on those of Kalabshah and even Dakkeh; but it was to be feared that all they could do was to make the strongest representations in their power to the Egyptian Government in order that they might take all possible precautions for the preservation of such monuments as lie within the area of the extended reservoir, and submit themselves with what grace they could to this application of the old-world maxim, *Salus populi suprema lex.*

Professor Petrie, in the course of his address said: "Last winter we found that we were limited to work at Ehnasya, about sixty miles south of Cairo. The attempts that we have made to be allowed to complete the history of the early Dynasties at Saqqara have been fruitless; and English work is still prohibited there under any conditions. To sit down to a site which had been abandoned as exhausted, after Dr. Naville's work at Ahnas or Ehnasya, was by no means tempting, but we had to make the best of it. Some of the results you have seen this summer in London. The temple site was cleared to the bottom, and over about three times the area of the former work. Four temples were shown to have successively occupied the ground from the XIIIth Dynasty to the Roman times. Historically, the important point was settled that Antef V. and a 'king of the Annu,' or Sryians, had ruled before the XIIIth Dynasty. And as regards objects we found the largest triad of granite that is known, a colossal group of Rameses II. and two gods, 11½ ft. high, and also the beautiful gold statuette

dedicated by the king of this province about 730 B.C. This is one of the finest gold statuettes known, and it was most satisfactory that the workmen fetched one of our party to take it from the undisturbed ground himself, so that every detail of its discovery is completely known. Two large gold octadrachms of Arsinoe were also found by another man, and almost every year we obtain gold work; while from excavations where no *bakhsheesh* is given gold is scarcely ever obtained. We have thus secured not only the history of the place, but two antiquities which, in their respective classes, are the finest known.

"In later antiquities we have made a collection of Roman lamps, from which a *corpus* will be published of photographs of more than a thousand in systematic arrangement. And the Roman terra-cotta figures have been accurately dated, and a large collection will be systematically published. Both these subjects can now be studied in future from a fixed basis of classification and dating.

"While waiting for the possibility of working more of the great historical problems—which can only be solved by very few sites in Egypt, all at present unattainable—the best prospect of important results seems to lie in the complete examination of Sinai. The mines were worked there from the 1st to the XXth Dynasty, and nearly 150 inscriptions are already known; as every explorer has recorded much which no one else has seen, it is probable that many more inscriptions exist. We hope to completely copy all of these in full size facsimiles and publish them next year. The questions about the mines have never been settled; whether they were for turquoise or for copper, or both together, is quite undetermined. Not a single plan of the positions or form of the mines has been made, and the whole of the mineralogy has still to be cleared up. If a permission to excavate is granted to the Fund, we hope to search the remains of the miners' settlements and their waste heaps from the 1st Dynasty downward. And later than all these Egyptian interests there are the various early Christian settlements in the peninsula, which all need planning and examination, entirely apart from the one convent which is now inhabited.

"A necessary foundation for this research in the eastern part of Egypt has been laid by the work of Captain R. Weill, who has just published an account of all the Egyptian inscriptions there, which is as complete as the various present copies allow. Such has been a laborious research, and very needful before doing fresh work there. These copies annotated by scholars will serve as a check on our work, and will show on the spot how much is already known. All the more we see the need of complete facsimiles to form a final publication. After we had formed our plans M. Weill offered to join our party at Suez and assist in our work, in which his knowledge will be of great value. We expect to form a party of about half a dozen copyists, and to have over a selection of my old diggers from Egypt. With such a party, and four months of steady work, I hope that we shall know a great deal more than has resulted from the hasty journeys of isolated travellers.

"This district has also great importance in view of the many questions of early Israelite history; and recently the later Jewish history has been much criticised by introducing a supposed independent kingdom of Muzri in this region, apart from the Egyptian Muzri. I fail to see that any allusions to Muzri in the historical books are not completely applicable to the Egyptian territory of Sinai, but any fresh light on the Egyptian occupation here in the later Dynasties will further strengthen such a conclusion. We have then before us for this winter a certainty of much solid work in the Egyptian frontier history and ancient mining, a fair chance of more light on the early Dynasties, and possibly some further illustration of the Jewish times.

"To return to Egypt. The serious question for us is how soon the great interest felt in such work, which has been so largely supported by the public, can lead to the remaining problems of the country being opened to our research; how soon the supremacy of Mammon in the management of that land may leave a little opening for the higher interests of thought, how soon political intrigue may cease to hinder scientific investigation. Although we do not ask for public money, which is so freely given by other governments for such work, we must all strive to obtain for England liberty of research."

Dr. Bernard P. Grenfell also addressed the

meeting, and said that the third season's excavations at Oxyrhynchus began on December 4, 1903, and lasted three months, and though they had not any fresh sayings of Jesus to announce, they proved quite successful. One mound in particular yielded a rich harvest of papyri of the first four centuries of our era, amongst which are numerous literary fragments, while another fourth to fifth century mound produced some theological pieces. In the extreme north of the town, where they were digging towards the end of the time, the papyrus-yielding layers ran as deep as 25 ft., so that the progress of the trenches was slow, and much remained to be done this winter in that part of the site. The papyri had as usual all been sent to Oxford for publication, pending a division with the Cairo Museum later. Dr. Hunt and he had not, however, been able to examine them this summer, since they had devoted most of that to beginning the formidable task of unrolling their large collection of papyrus cartonnage from Ptolemaic mummies found between 1900 and 1903, together with the second collection of mummified crocodiles wrapped in papyrus rolls found in the Fayûm in 1902. While the Oxyrhynchus papyri, which were packed between layers of paper inside tin boxes, would keep dry for an indefinite period without being unrolled, the cartonnage and papyri from crocodiles not only are much more fragile to start with, but had to be packed in cotton wool—a substance which attracted and retained damp—so that they could not be expected exactly to improve their condition in an English climate. Not that those which they had brought back had suffered at all so far by being kept, but it is certainly not advisable that they should continue longer than is necessary without being unrolled. The Hibeh papyri had quite come up to their expectations. A special feature of these fragments from Hibeh were their great literary antiquity. Dr. Hunt and he left in a fortnight for Egypt, and the excavations at Oxyrhynchus will be resumed early in December, it may be for the last time. Not that they could possibly hope to finish excavating the site on the scale which it has the right to claim after all that it has yielded. They might indeed, perhaps, hope to finish those portions in which papyri of the Roman period were found close to the surface, and which were, therefore, the most profitable. But the mounds of the Byzantine period were worth clearing away systematically for the sake of finding theological pieces, apart from the chance of finding earlier documents in the lower levels. Unfortunately, the income of the Græco-Roman Branch, at no time large, threatened to be insufficient for providing an annual expedition in addition to the annual volumes which they were pledged to publish, and after the coming winter the cessation of work in Egypt may for a time at any rate be necessary. While no one would regret this more than Dr. Hunt and himself, if they were compelled to stop in the middle of what had been a fairly consistent tide of success, especially when there are so many rivals in the field, and the number of good sites was rapidly diminishing, they would have the satisfaction of knowing that they had done their best to avoid such a result.

On the motion of Judge Baylis, seconded by Mr. Cotton, a vote of thanks was passed to the chairman for presiding.

TRINITY CHURCH, SALFORD.—In their Bill which they will introduce during the next Session of Parliament for effecting an enlargement of Exchange Station, Manchester, the London and North-Western Railway schedule the site of the Church of Holy Trinity, Salford. The church, in Chapel-street, was first erected in 1635, with a capacity for 800 persons; it was rebuilt after the Grecian Doric style, in 1752, and on two subsequent occasions has been repaired and restored. The church was built by Humphrey Booth, in whose descendant the patronage still vests, as a chapel-of-ease to the then parish church of Manchester; it is the oldest church in the borough, and possesses many historical and local associations. Strenuous opposition to its demolition is expected.

NEW PULPIT, PARISH CHURCH, WESTON-SUPER-MARE.—A pulpit has been placed in the parish church of St. John the Baptist, Weston-super-Mare, as a memorial to the victims of the fire with which the town was visited in May last. The pulpit, which is of Caen stone, enriched with polished marbles and alabaster, is nearly 8½ ft. in height. The work was carried out by Messrs. Harry Hems & Sons, of Exeter.

ECONOMIES OF CONSTRUCTION IN SMALL HOUSES.*

The term "small houses," I have considered, includes cottages, entrance lodges, houses detached, semi-detached, and houses built in rows. The subject, therefore, I have found too vast to do more than make general suggestions upon, and I beg you to forgive me if I do not satisfy your expectations. I am not at all sure, too, that I shall be able to suggest sufficient points of economy, for I will not, if I can help it, sacrifice quality for cheapness, but rather suggest that economies be obtained by adopting *simplicity* as the principle.

The aim, then, is economy. The subject, small houses, including cottages, entrance lodges, houses detached, semi-detached, and houses built in rows.

The details will be:—(1) Site, (2) Aspect, (3) Special requirements, (4) Size and number of rooms, (5) Plan, (6) Elevation, (7) Materials, (8) Sanitary arrangements and drains, (9) Decoration, (10) Cost, (11) Builders.

(1) *Site*.—Both for cottages, as well as for houses in a row, if possible, the site should be on fairly level ground, else the foundations will run up the cost of the building.

(2) *Aspect*.—Though this has little to do with economy, aspect should be considered even in cottages, the south or south-east being the best, and moderately near trees for protec-

* A paper read before the Discussion Section of the Architectural Association, on Nov. 2, by Mr. A. H. Belcher, A.R.I.B.A. A short abstract of the paper has already appeared in our pages, but as since then Mr. Belcher has sent us some of his illustrations, and as the subject is of considerable practical interest, we give the paper so far as it can be given without the full number of illustrations, which were constantly referred to.

tion from winds, and these often afford pretty views towards the living-rooms can be arranged to have their windows looking.

If the house is one in a row you may not have a choice of a site, and must then arrange your best rooms to have the best aspect you can give them.

(3) *Special Requirements*.—Even a cottage may have its special requirements as one at Hollingbourne had, which I shall presently quote. It was for a man and his wife who did the laundry work of a mansion, and, therefore, a special wash-house was needed which was put at the back with a lantern-light over to let out the steam.

Generally speaking, a cottage or small house is required and built for the working class, viz., a man and his wife with or without a family.

(4) *Size and Number of Rooms*.—Cottages and very small houses for the working class in the country are provided with about six rooms.

In London and suburbs the small houses are divided up into separate tenements, each floor containing three or four rooms as a separate tenement, viz., sitting-room, kitchen, and two bedrooms, and sometimes a separate water-closet on each floor, while on the ground floor at the back will be a wash-house for the use of all the tenants.

The general run of the speculative builder's house in the suburbs of this great Metropolis, let at about 40l., will contain about seven rooms with a bathroom and water-closet often combined in one room. (But the number of rooms will depend, I suppose, as the song has it, upon "Matilda and the builder, and the childer.") This bathroom is a perfect boon to those who

like washing in these days, and I really believe it is more done now than, say, thirty years ago, when you could not get a bathroom in a small house, no, nor yet in a large house. The accommodations, I believe, draw poor attention, and prevent them from looking at the construction and beauty, of which it is often little or none.

For size of rooms, I think no sitting-room should be less than about 100 sq. ft., or 11 room than 80 sq. ft., and 9 ft. high for ground floor, and 8 ft. for first floor, but they are, of course, built of less height. The 8 ft. for first floor may for half the area of the room in the roof, and this saves waste of room. Mr. Bateman, in his most interesting paper on this subject in *The Builder* of March, 1, gives 8 ft. 6 in. height for ground as well as first floor.

(5) *Plan*.—(1) For small houses of the speculative builder's type I show a plan of six houses in Fitzalan-street, Lambeth, which have borrowed. It is for a row of houses the working class, three stories high, let out the floor of three rooms and a water-closet, with a wash-house on the ground floor at the back for the use of all the tenants.

Cottages and lodges give more scope for planning. Generally speaking, there is doubt that the cheapest form of plan is a square or oblong under one roof, with only one chimney stack if possible.

(2) The "But and Ben," or working cottage, by Mr. R. Norman Shaw, R.A., illustrated in the *Building News* in 1873, really an oblong plan under one roof. The name implies, it is a two-roomed cottage with the clever arrangement of recessed beds,* and only one stack.

(3) Cottages at Hollingbourne, Kent, for the laundry woman and her husband, did the washing for the mansion close by, this a special wash-house was required. It is a six-roomed cottage, and one of the objects I kept in view was to have, if possible, a fireplace in every room, yet only one stack. One room, however, is without a fireplace, although there is only one stack. The wash-house put at the back.

(4) For entrance lodges I give three sets of drawings. First, one of the entrance lodge Steyne House, Bembridge, in the Isle of Wight for Sir John Thornycroft, by my brother Mr. John Belcher. This is a four-roomed lodge two stories high, with one stack, and has a wash-house and water-closet at the back. It was not, however, so far as I know, built on the cheapest method.

(5) One of the *cheapest* lodges I know is an entrance lodge at Amersham, Buckinghamshire, by Mr. T. P. Figgis (see lithograph plate). It is really a four-roomed lodge, with store-room on first floor, and wash-house at side. It is signed on the square-plan principle with the roof all round and one stack in the centre.

(6) I would refer you also to Mr. May B. Adams's book on "Modern Cottage Architecture" recently published. He gives many varied examples of lodges and houses of eminent men, and the suggestions he makes are most useful. I will just quote one or two.

Plate XXII. is a lodge at Leamington, Mr. Briggs, one story high, with four rooms and one stack, but you have to pass through the room to get to the others.

Plate XXXII. is a gardener's cottage at Great Warley, Essex, by our President, Mr. Guy Dawber (see lithograph and Fig. 1). It is two stories high, and has six rooms and one stack and is built with red bricks and tile. It is to me an excellent example of beauty in simplicity of design obtained by proportion of solids and voids.

I also give another example, by Mr. E. C. Dawber, of two entrance lodges in one, at Moreton-in-Marsh, which he has kindly lent. These are built in stone, being in the county of Gloucestershire. Each are two stories high and contain five rooms, and have one stack between them. In these the simplicity of their design is their charm, nothing is introduced but what is wanted for use. The stack, I presume, is built in brick because it bonds better than the rubble work. There are some interesting details of these lodges.

Next is a clever plan for a cottage at North by Mr. Arnold Mitchell (Fig. 2).

Plate XXXIX. I mention here, though it belongs to a larger type. It is called Cott-

* We consider, however, that these beds in recesses are most unhealthy, and should never be adopted.

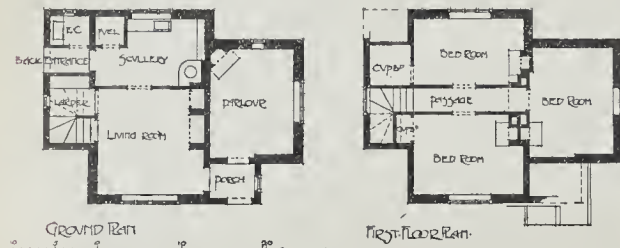
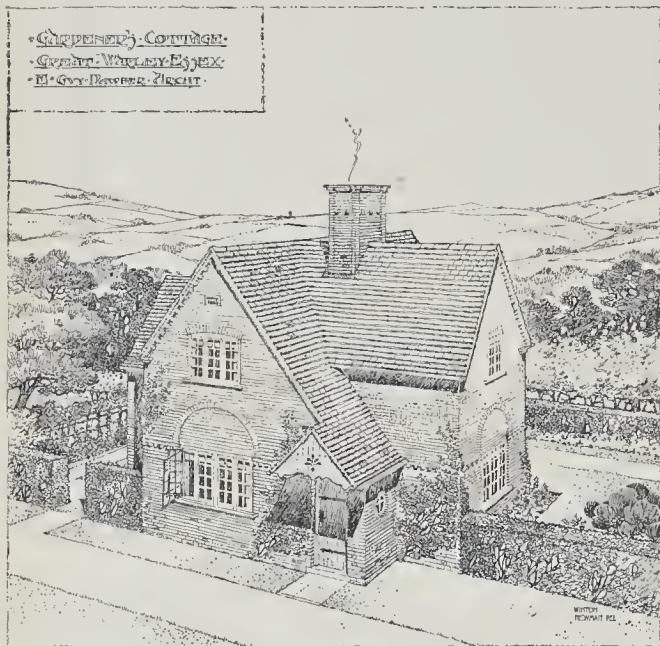


Fig. 1.

at Medmenham, by Mr. Arnold Mitchell, and is on the quadrangle plan. It is really a nine-roomed house, but is very simple and nice and works well.

Plate XLII. is a house at Royston, by my brother, two storied with eight rooms, and has a porch.

Of groups of cottages I will just quote the following:—

Those at Chisclhurst, by Messrs. Ernest George and Peto, 1878; three storied, five rooms, and looks somewhat expensive. Those at Pinner by the same architects in 1879. Those at Midhurst by the late Mr. Ernest C. Lee in 1878. Those by Mr. R. Norman Shaw in 1878.

A group of four cottages at Hidcote, in Gloucestershire, by Mr. E. Guy Dawber. These work out exceedingly well both in plan, elevation, and grouping, although they do have five stacks to the four cottages.

Then there are those by the Elementary School of Design, illustrated in A. A. Notes for August this year, to be built in stone. But these have six stacks between three cottages.

Lastly, I quote a good example of a pair of cottages at Trushurst by Mr. W. Curtis Green, under one roof. These are very simple in plan and were very cheap though well built.

Then there is the question of almshouses, often built in the form of a quadrangle, but as these generally include other buildings, such as a chapel, they are really outside the scope of this paper.

For middle-class houses in a row I might quote those at Turnham Green by Mr. R. Norman Shaw in 1878—three stories high, with nine rooms, and simple elevation.

For single houses of a larger type there is a good example of one at Buckhurst Hill by Mr. A. Needham Wilson, simple in plan and elevation, and which was built very cheaply.

Mr. E. Guy Dawber has also lent me his drawings for a house at Hampstead. It is really three stories high with eight rooms, built with red bricks and red tiled roof, and is very compact, although it has a spacious hall. Here are some interesting details of this.

(6) Elevation.—Much might be said on this head, but I do not believe in laying down any hard-and-fast rule, except that I venture to think *simplicity*, if worked out in accordance with the requirements of the cottage or small house to be designed, and taking the materials most easily obtained in the neighbourhood, is the right principle to adopt.

If only the speculative builder of small houses would believe this, and would at least obtain the assistance of an architect who devotes his life to the study of the subject, we should not see half the heaps of rubbish and mortar piled up on either side of the new roads constantly opened up in the suburbs of this great Metropolis.

Walls are run up, broken with bay windows for every house must have a bay window). These are faced with red bricks, which they often colour pink and then point with black tuck pointing. A brick apron is put under the windows cut to fantastic shapes. String courses of terra-cotta are built in across the front and enriched, at so much a yard run, and terra patere, and panels are introduced to fill up any spaces that are left. Some houses with bays have the angle mullions in stone, with carved caps of realistic foliage which they call Gothic, a small moulding half way down, and a moulded base, while the edges in between are all stop chamfered. Then a pediment will be put over the entrance door, with carved scrolls in the tympanum of a Classic type. The door itself is heavy bolection moulded, highly grained and varnished, and the upper panels glazed with a kaleidoscope of stained glass of all the colours of the rainbow. Green slates cover the roof, purple slate ridging finish the eaves of the bay, while red tile cresting crowns the roof. I won't weary you with any more details; you know them only too well. But for all these fancies, which every one can see, the speculative builder has to scant his timber construction and anything else that you cannot see. In all this, simplicity is sacrificed for a false show. I feel constrained to add, in the words of Shakspear, "Therefore, thou gaudy red, I will have none of thee."

The speculative builder, of course, says he cannot afford to employ an architect, and I have almost wondered if our Advanced Class of Design could not be set to design a simple suburban house which might be offered to some speculating builder for a small fee, sooner than see some of the monstrosities that are put up.

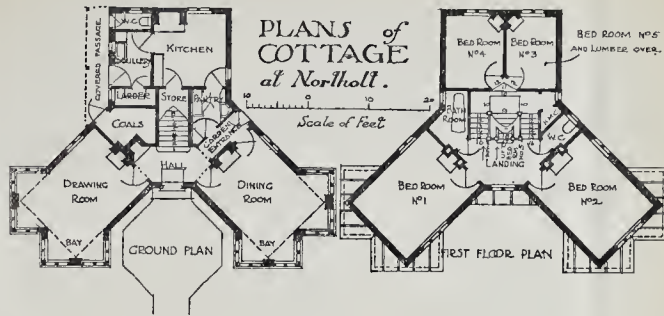


Fig. 2.

Well, if anything can be done, let us remember the principle of simplicity, for the builder often thinks an architect's design costs more money.

(7) Materials.—This, perhaps, is the crux of the subject, and a difficult one.

First, as to cottages in the country, materials must be governed by the locality, and I suggest using only those that can be readily obtained.

In the clay counties bricks are to hand, in counties like Somersetshire stone is cheaper, in Norfolk flint stones are used. When using bricks, local red facings often look very nice in colour and can be used.

If tiles are ready to hand you can use them above the ground floor for weather tiling as well as for the roof. Those for the cottage at Holingbourne were made about half a mile away. It is true they cost a little more than red facings, but not more than about 2d. a foot super, and if you use them you can build your walls behind them with brick on edge in mortar as sketch (Fig. 3).

I would add, do not use Broseley tiles if you can help it, they are expensive.

If tiles are not to hand rough cast may be used instead of weather tiling, as that is about the same price or even cheaper than facings. For rough cast Mr. Wilson informs me the walls of the house at Buckhurst Hill were built with grizzles, and the rough cast was a rendering in Portland cement, finished with rough cast made with clean coarse grit mixed with blue has lime putty and thrown on with a trowel.

At the lodge at Amersham by Mr. Figgis the external walls were 11 in. hollow walling formed with two half brick walls in cement with a 2 in. cavity between and bonded together with galvanised iron twisted ties with clawed ends, three ties to each yard super, and this cost 1s. 3d. foot super.

For damp course in the country slates are the cheapest and are quite effectual.

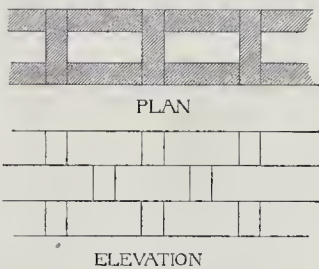


Fig. 3.

For roofs slates are cheaper than tiles, the former being about 30s. a square and the latter about 45s., but slates do not look nice in a clay district. In either case I think rough boarding should be used under them, but ½ in., or rather, I would say, ¾ in., will do. Felt may be given up, it costs 9d. a yard super. Where tiling is used I think nothing looks nicer than half round ridge tiles for the ridge.

For flashings, I think far better be safe and use lead—zinc is poor, and cement filletings crack often with the frost.

Thatched roofs I confess I know nothing about; perhaps someone present can enlighten me on the subject.

Half round eaves gutters I think look better and are cheaper than moulded, and round R. W. pipes I think better and cheaper than square.

Floors.—For ground floors, if you have not much top soil to take off, you can put a bed of 4 in. cement concrete floated in cement, with a 1½ in. deal wood block floor on top. This was done in the lodge at Amersham.

But cheaper than this would be to bed 4 in. by 3 in. plates as joists splayed two edges in the concrete bed and a 1 in. floor nailed on to this. This was done at the cottages at Trushurst by Mr. Curtis Green.

If you have to take off as much as 12 in. or more, then the usual method seems the best one to adopt, viz.—a bed of 4 in. concrete, half brick sleeper walls built honeycomb, 4 in. by 3 in. plates, 5 in. by 2 in. ground joists, and 1 in. flooring. And this is cheaper than the wood block flooring, I think, by about 7d. a foot super.

For sculleries and wash-houses a concrete bed floated with ¾ in. neat cement is the cheapest and cleanest.

For first floor, if you have not much funds joists and flooring only can be used, and lime-white the underside.

Finishings to Walls.—Some would adopt two-coat plaster, but this I think risky. I don't think you can give up the "render, float, and set" for living and bed rooms.

For a wash-house pointing and lime-white is the best, and if you have the room partly in a roof, and funds will permit, put ½ in. matched boarding on the roof timbers. Plaster will not do—it will come down with the steam.

Windows.—Double hung sashes are generally cheaper than casements and frames, but do not look so nice. If you use casements and frames, in cottages I think 4 in. by 3 in. will do for frames and 1½ in. casements, and I think such labourers as splay-rebated bottom-rails and hollow grooves to styles should be given up, they all cost 1d. foot run. But sash bars always look nice and do not cost more than 1d. foot super over casets in one square.

For ironmongery I would not choose quite the cheapest, as it is often inferior, but for a cottage japanned iron will do, in fact while the war is on it ought to be the rage. For reveals plain plaster will be found cheaper than wood linings and architrave.

Where casements and frames are in weather tiling or rough cast, stone cills are not required, as the frame is best flush with the tiling or rough cast and the oak cill made about 2 in. wider.

In London you cannot project timber beyond the external face of the wall, but if you wish to finish the head and sill of your frame with a moulding it can be done in oak if you make application to the L.C.C.

If your frame is in rough cast you can finish the head and sill with a course or two courses of tiles fixed sloping and no application is needed for this.

Where your frame has mullions, and is flush with the external face of brickwork you can finish the top with flush brick on edge, and this saves arches and cuttings.

Doors.—For cottages, if you use panel doors, I think square framed quite sufficient and look well; and do not put large panels, else you must specify the thickness, or the builder may use thin wood and the panel will split. For general

thickness of internal doors $1\frac{1}{2}$ in. will be sufficient. For outhouses, such as water-closets and coals, etc., ledged and braced doors are more economical. For linings use 1 in. plain with $\frac{1}{2}$ in. by $1\frac{1}{2}$ in. stop planted on, as more economical than $1\frac{1}{2}$ in. rebated on the solid.

Partitions.—For partitions other than stud partitions $1\frac{1}{2}$ in. square framing about two panels high looks, I think, best, but at the lodge at Amersham $\frac{3}{4}$ in. matched and V-jointed boarding on 3 in. by 2 in. rails were put.

Stoves.—For stoves I venture to think a combined stove and chimney piece is the most economical, but of these I only know a few that I care for, viz., some of the early ones of those supplied by Mr. Elseley at p.c. 2l., 2l. 10s., and 2l. 15s. Or you can obtain a stove at Bratt Colbrant's at ll. 7s. 6d. and design a simple chimney-piece for that.

Ranges can be had almost anywhere, though none that are safe under 5l.

(8) **Decoration.**—Under this heading I take painting and papering. For painting in my humble opinion there is nothing to beat plain ivory white throughout for economy, effect, and cheerfulness. The only thing I know against it in cottages is that finger marks will show on the doors where they are opened. Well, then, I would say paint black finger plates on the doors.

Of course, the front door can have a choice colour for effect, and I do not think it necessary to add, do not do as the speculative builder and grain to imitate oak or any other wood which it is not; it would be a lie, and for Raskin's sake give it up.

Mr. Maurice B. Adams in his book mentions a useful point, viz.—the tarring the inside of eaves gutters, instead of painting; it lasts longer.

Papering is far better left for six months till the walls are thoroughly dry, but if anything is required I think plain coloured lining paper is best and looks best, and even brown paper. But do not use blues, as these are sure to fly and show patchy, and this applies also to papers with a pattern on.

(9) **Sanitary Arrangements and Drains.**—These you will have little choice over, as they will have to be carried out in accordance with the Regulations of the Urban District Council, whose regulations sometimes are often in my humble opinion very absurd; such, for instance, as separating the rain water from the soil drain where the rain is not stored for use.

The weights of pipes are regulated, generally by the water companies, and these pipes I think are best not covered up with pipe casings, as uncovered they are more easily accessible.

Closets I cannot suggest, their name is legion, and new ones continue to flood the market, but whichever you select, if you have the pan and trap in two pieces you can often replace the one if required without the other. And again, if you select a wash-down closet with a seat, choose those in hardwood, else the hinges will probably be poor and not last. They are now made without lids, and these appear to me to get over this difficulty.

If the cottage is a gardener's one, you can put an earth closet. I mention gardener's cottage, as other servants do not always keep them in order, and in that case they are not healthy. They were used at the cottages at Trushurst and Amersham.

As small suburban houses now generally have baths, why should not cottages? Mr. Maurice B. Adams in his book gives an ingenious device for one in the saving of room, by sinking it in the scullery floor and covering it over with a lid, which is stood upon after the bath is used.

In some places in the country the rain water is collected, and in this case an underground tank is built in brick, from which it is pumped up.

For drains, where the house is one in a row and they have to pass under it, iron pipe drains are best, as these have less joints, or stoneware encased entirely in concrete can be used with the usual gulleys outside, manhole next sewer, with air inlet pipe from same, and exit pipe at the highest end of drain for which the soil pipe can be used. When in the country a cesspool with overflow takes the place of the sewer.

Of course, there are a thousand and one little points I have not touched upon, which may be treated economically by adopting simplicity as the principle. For instance, if you wish to finish a certain spot with a moulding, use if possible the same moulding that has been

adopted elsewhere so as to save cutting fresh irons.

Before leaving the subject of materials, I have said that materials used should be those obtained in the locality. And this has reminded me of a sketch I attempted on a holiday in Switzerland. It was of a Swiss chalet in the village of Engelberg, where we had to go for a week, as the hotel was full. This was three stories high, the ground floor built of stone, the upper part entirely of timber. The walls were built with logs of timber one on the top of the other, all framed together, covered outside with boarding, and that again with wood shingles. Where the cross walls and side walls met the front walls they projected outside the latter and formed buttresses. The gables were low pitched, and had beautifully cut barge boards, with pendants, and the halcyons were cut with fret-work, while the roof, which had considerably overhanging eaves, was kept from being lifted by the wind with large stones placed on the top. Internally some of the floors were covered with parquet, and the ceilings panelled in wood. If you look at the rough sketch you will see all this perhaps better than I can describe it.

One other interesting arrangement which has been adopted nearer home, is that of some bungalows on the beach at Shoreham near Brighton. An artist cousin of mine had one built some years ago when there were only a few, now I am informed that there are over two hundred. The one my cousin had built was, I believe, illustrated in the *Strand Magazine*. The process is described briefly as follows:—Three railway coaches were purchased for from 10l. to 15l. These, according to the class purchased, consist of four or five compartments. One was first class, another second, and another third. They were raised on sleepers to the height required and placed in position as shown on sketch plan.

The centre space was divided up into dining and drawing rooms and roofed in. Some of the partitions were knocked out of the coaches to make good size bedrooms, the doors of same opening on to the sitting-rooms. Kitchen and other offices were formed at the corners and roofed in, the space from floor of coaches to the ground was boarded in, and when all was complete the whole was painted white to get rid of the look of the railway, and, *voilà*, you have your habitation, at a cost of from 150l. to 200l., and, as far as I can tell, a nine-roomed house.

(10) **Cost.**—And now to return to cost. I can give the cost of some of the examples I have quoted as follows:—

For Cottages.

- (1) The lodge at Amersham cost 225l., or 6d. a foot cube. 1900.
- (2) The gardener's cottage at Great Warley, 340l., or 7½d. ft. cube. 1903.
- (3) The cottage at Hollingbourne, 475l., or 10d. ft. cube. 1901.
- (4) The lodge at Bembridge, about 400l., or 10d. ft. cube. 1886.
- (5) The pair of cottages at Trushurst, 660l., or 6d. ft. cube. 1900.
- (6) The two entrance lodges at Moreton-in-Marsh, 500l., or 6½d. ft. cube. 1903.
- (7) The four cottages at Hidecote, 1,095l., or 5½d. ft. cube. 1904.

For Houses.

- (1) The house at Buckhurst Hill, 680l. at 6½d. ft. cube. 1902.
- (2) The house at Royston, 1,542l. at 6½d. ft. cube. 1893.

Now this shows what has been done, but we must never forget it may not show what can be done, as the cost of building may go up, or it may go down, and that point must always be borne in mind when considering the cost.

(11) **Builders.**—As to builders, of course small builders, especially country ones, build cheaply, but I always feel they are dangerous, as they are often men who have been in one trade only, and know little about the others, which they let out to piece work. And if they have been bricklayers they will probably not do good joinery, and you may have shrinkages and defects in this trade which everyone can see and grumble at. If you employ a fairly substantial builder the work may cost a little more but it is more likely to be well done throughout, and he will probably understand your details better. I therefore recommend this class of builders being invited to tender.

In conclusion, doubtless I have missed many points untouched, and whatever I have missed for want of time, I suggest that the simplest

method of doing things is generally the most economical, and the most truthful, and we can hark to our old motto, "Design with beauty build in truth."

THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of the Association was held on Friday evening last week at the new premises of the Association, No. 18, Tufton-street, Westminster, S.W. Mr. E. Gay Dawber, President, in the chair.

Mr. Louis Ambler, hon. Secretary, having announced that Mr. E. M. Gibbs had been reinstated as a member, the following gentlemen were elected, *i.e.*, Messrs. Quittenen, J., Warrington, Surrey; Sich, P. B. W., Chiswick, Napier, W. A., Camden-square, N.W.; Turmeau, A., Bow, E.; Chick, H. R., Tulse Hill; Thorpe, W., Hampstead; Webber, S. J., Maidenhead; Kent, J. C., Hailsham, Sussex; Rogers, G. C., East Sheen, S.W.; Winship, B., London; Thomas, A. J., London; Woods, F., Maidenhead; Grant, T. F. W., Sittingbourne; Batalha-Reis, V. C., Notting Hill; Bateman, H. F., Harmondsworth; Boss, Albert; Victoria Park, N.E.; Hipkins, F. W., London; Crawley Boevey, F. H., London; Boyle, E., Westminster; Aickmann, W. A., London, and Dahl, J. L. G., London.

The late Professor Kerr and Mr. Batsford.

The President said that since the last meeting they had to deplore the loss of Professor Kerr, one of the original founders of the Association and their first President, in 1847. Professor Kerr was always a firm supporter of the Association, and its educational method, having for fifty years taken the greatest interest in its work, and in 1897 he was present on the occasion of the Jubilee Dinner, although it was then a very old man. They all knew Professor Kerr's great hooks, and the interest he took in the affairs of the Royal Institute of British Architects, and he was sure the members would wish to pass a vote of condolence to the relatives of the deceased, and he moved accordingly.

The motion having been agreed to in silence the President said they had also lost a friend to a certain extent, of the profession in a Bradley T. Batsford. His firm had always been extremely kind to students and others, assisting them to get such books as they needed, and he believed that the members would desire that a letter of condolence be sent to the Batsford's relatives in the sad loss they sustained.

This motion was also agreed to in silence.

The Building Fund.

The President then announced that following further donations had been made to the Building Fund, *i.e.*, Messrs. W. H. Le 21l.; Owen Fleming, 10l. 10s.; Wm. Will 10l. 10s.; E. Dru Drury, 5l. 5s.; Leslie Green, 3l. 3s.; A. H. Ryan Tenison, 3l.; F. W. Bedford, 2l. 2s.; H. Farquharson, 2l.; W. L. Grant, 2l. 2s.; Percy L. Marks, 2l.; George Frampton, R.A., 1l. 1s.; C. L. Hamp 1l. 1s.; Geo. Hubbard, 1l. 1s.; and Arthur Keen, 1l. 1s.

Mr. Louis Ambler announced the following donation to the library: "The Architecture Rundschau" (9 volumes); "Blätter für Kunsthandwerk" (3 volumes); presented by Mr. Edwin O. Sachs.

A vote of thanks was accorded to the donor.

Sir Aston Webb, R.A.

The President said they would all be in agreement with what he had to propose, that the most hearty congratulations of the Association should be sent to Sir Aston Webb upon the honour he had just received. His Majesty the King. Sir Aston Webb had been a consistent friend of the Association from early days, and he had been their Secretary, vice-President, and President, had always taken the warmest and kindest interest in their affairs. When the gift of new premises was being arranged with the Royal Architectural Museum, no one further the effort to make the matter a success than Sir Aston Webb. That was not an occasion to speak of Sir Aston Webb's work they all knew it well, but he could say of his urbanity, kindness, and willing advice, help to anybody who came in contact with him would endear him to all, and he was sure they would hope that Sir Aston Webb would be spared to enjoy his honours.

The motion having been heartily agreed to

Mr. W. Henman then read the following paper on

Ventilation.

The invitation which I received from the Architectural Association to address its members on the subject of "Ventilation" was accepted as a compliment and with somewhat of a light heart; but more recently I have been reminded by Mr. (now Sir) Aston Webb, R.A., that, like politics and religion, the subject of ventilation is apt to arouse passion and prejudice. This fact has recently been unpleasantly forced upon me to such an extent that I have had seriously to consider whether I could venture to face another audience and run the risk of exciting animosity in again dealing publicly with the subject.

To have withdrawn, however, might lead to the suggestion that I had not the courage of my convictions, or at least that I feared consideration and kindness might not be accorded to me by the members of this Association. Believing that truth and justice will eventually triumph in this as in other matters, and trusting in the good nature and reasonable spirit in which you will receive the few remarks which I have to make on this thorny subject, I have decided to brave the occasion, simply premising that it will be my endeavour, not so much to raise controversy as to stimulate observation, in the hope of extending sound views upon the principles involved and greater intelligence in their application.

Difficulties which confront one in dealing with the subject of ventilation arise from the fact that it principally relates to functions of life which, in their fulness, are practically beyond human comprehension, and because it has to deal with individual susceptibilities as well as with an invisible, elusive, and almost intangible body, viz., the atmosphere, affected by chemical and physical laws, but yet only partially understood. Literature on ventilation is somewhat profuse, and many eminent scientists have investigated various phases of the subject, yet it appears to me there is still an opening for a concise treatise which will deal with it in a scientifically practical and up-to-date manner, without prejudice, to serve as a textbook for architectural students. Under limitations imposed upon me by the Editor, I wrote an article some three or four years past which appeared in a publication called "Modern House Construction," which, in some respects, deals with details it would be tedious to repeat in an evening's paper, although in substance I must place before you the same conclusions as those dealt with in that article and drawn from my own practical experience.

Perhaps the most unfortunate circumstance in connexion with ventilation results from the fact that eminent early writers thereon, whose works are still largely resorted to, make assertions from their undoubtedly careful observations which, in face of more modern practice and the great improvements which have since been effected in appliances, cannot now be accepted.

One of the best standard works is that by Dr. D. B. Reid, who for some years supervised the ventilation of the Houses of Parliament. He published in 1844 a book entitled "Illustrations of Ventilation." His observations and general statements are fairly trustworthy, but his deductions are sometimes at fault.

A more modern book is that of Dr. J. S. Billings, of the Johns Hopkins' Hospital fame, entitled "Ventilation and Heating," consisting of some 500 pages. It brings together a vast mass of useful information on the subject; but being written by an American principally for use in America, a considerable portion of its contents is unsuitable for this country, and a careful perusal of the volume left on my mind a sense of indefiniteness, examples being given of so many different methods without clearly indicating those that are worthy of adoption or those that should be avoided. There are numerous other writers on different phases of the subject, but the two mentioned are, so far as I know, the only books in English which deal with it exhaustively. Yet there is in both a lack of that practical guidance based on modern experience such as architects now require. The result has been to engender what I may term a chaotic state of mind in the profession. Some are inclined to dogmatise upon the simplicity of this or that method, while others prefer to do nothing, on the excuse that the difficulties are too abstruse. Nevertheless there are certain well-recognised facts which ought to be

known by all, and intelligently made use of by those who realise the necessity for efficient ventilation or whose province it is to provide for it in our buildings.

It would be impossible for me in the course of an evening to go fully into what is known of the chemical and physical properties of the air we breathe. I must take it for granted that you are acquainted with its accepted composition and general characteristics. We all recognise our dependence upon the continuous breathing of atmospheric air to sustain life; but it is always realised that to sustain healthy life air must not only be breathed in sufficient quantity but that it must be of suitable quality?

Under ordinary conditions nearly everyone who can use the muscles of his body for filling his lungs may get quantity, but it is not always obtainable in suitable condition or state of purity. "Give us some air" is an expression often made use of even by people fully surrounded by air. What they really want is fresher or purer air. Ventilation, therefore, must deal with both quantity and quality, or it cannot be considered effective.

The science of ventilation may be said to consist in providing and employing means by which adequate quantity can be procured and the art of ventilation as that of securing a wholesome atmosphere for the purpose. Unless air is reasonably pure outside a building it is scarcely possible to have it pure within. Air may be screened and washed, but it is questionable if any means have yet been devised by which, in its passage from without to within a building, a thoroughly impure atmosphere can be made wholesome.

It is rather beyond the province of architects to practically deal with the outer atmosphere. The question of maintaining it in a reasonable state of purity is of necessity a communal matter, and must be attended to by the State and by local authorities; yet each individual is personally responsible to the community for every act of commission or omission which leads to contamination of the atmosphere. So much depends upon the condition of the outer air whether or no good ventilation can be secured within buildings, that it is right we should direct public attention to the fact that no means supplied by architects for securing ventilation within buildings can be effective unless the outer atmosphere is maintained reasonably pure and wholesome. Millions are spent in order to secure supplies of fresh, wholesome water, because people recognise that an impure supply results in ill-health, disease, and death. But probably in consequence of the subtle nature and obscure effects of the atmosphere which all of us constantly breathe, expenditure is ever grudged in obtaining it pure and wholesome even within our dwellings.

It is this subtle nature of the atmosphere which doubtless accounts for the difficulties which most people find in dealing with it. They cannot see, and only with difficulty handle it. Yet, as Sir Wm. Preece when young is said to have been told by his father: "The air, although you cannot see it, is as material as water; you feel it in every puff of wind, and see it in every bending bough." I am convinced by experience that the possibilities of dealing with it for the purpose of securing ventilation are greatly facilitated by fully recognising the material nature of the atmosphere.

Air and water have different properties, yet in many respects they behave in a similar manner, and I believe the more thoroughly you study the latter and picture to yourself the material nature of the former, the better able you will be to make provision for adequate circulation of air in your buildings. Air is more universally distributed around the earth than is water, and, fortunately for us, it is in the open, naturally maintained in a fairly uniform condition; many influences being continuously at work to keep it in a sufficiently pure state for supporting human existence. Yet, even apart from human agency, it becomes fouled. In certain localities the atmosphere is well known to be unhealthy, and although it may appear heretical to say so, in these days when the open-air treatment is so greatly extolled, there is reason for believing that better health and comfort can at times be secured within doors than outside—or why should buildings be erected? Partly, no doubt, to shield ourselves from excessive velocity of winds, which may give us a pure atmosphere, but then the over-rapid movement of air is liable to so reduce the heat of our bodies when at rest that ill-health may result.

An important difference between air and water is that while air is very elastic and can be compressed, water cannot be reduced materially in bulk by compression. It is now demonstrated that air can be brought to a liquid and even solid condition, and we know that water can easily be frozen solid or volatilised. I mention these facts in the hope of impressing upon you the material nature of the atmosphere, that it can be handled and dealt with, that it is subject to certain laws which can be ascertained, it can be measured and weighed. Like water, it dissolves certain substances and vapours. It will hold in suspense insoluble matter. Fresh air, like fresh water, may become fouled by contact with impurity, either in the open, in confined vessels, or by passing through dirty conduits.

If desiring a "drink of water" you find it unpalatable, it would be folly to continue taking it from the same source in the expectation of getting a refreshing draught; or if you know of a pure source of supply, you would not willingly permit it to be conveyed in a dirty vessel or through a foul channel. Similarly you cannot expect to have fresh air unless it be taken from a pure source, and having a pure source around a building care should naturally be exercised so that it be not contaminated by contact with impurity, whilst entering or when within a building, before being breathed by occupants.

Architects being principally concerned in the design of buildings which, on being erected, cause obstruction to the free circulation of air, it is only reasonable that upon them should devolve the necessity for providing efficient means whereby adequate change of air can be secured within and around the buildings they design and erect, so that stagnation may not take place to the injury of those who occupy them, or to the detriment of surrounding properties.

Movement above all things is necessary for maintaining a healthy atmospheric condition. Consequently, the first consideration in respect to securing ventilation within a building is—how can the required movement be brought about? Probably the earliest buildings were erected in order to secure protection from excessive movement of the atmosphere. Our term "house," signifies a covering or protection. At an early period the necessity for securing ventilation must have been recognised, because in the simplest dwellings an eye or opening for the wind, now termed a window, was provided; and as there must also have been a second opening for the ingress and egress of individuals, means were provided by which movement of air within could take place. When it is understood that air is a material body it becomes evident that, before a fresh supply can enter, an equal volume must make way for it. Consequently an outlet as well as an inlet becomes essential, and at the present day buildings are mostly provided with both windows and doors, but, unfortunately, they are not so generally made use of for assisting ventilation as they might be, although by their reasonable regulation, according to the varying state of the outer atmosphere, it becomes possible, by the exercise of a little personal attention, to adjust matters. Except the property of diffusion, which is common to all gases, air has no inherent power of movement, but movement being essential for maintaining its freshness and for securing efficient ventilation, some power must be brought to bear upon it. The most potent natural power available is wind; yet wind is only the result of varying temperature on large bodies of the atmosphere. When heated, air becomes specifically lighter than an equal volume of cooler air; the latter falling by the power of gravitation, forces up the warmer, and therefore lighter air around; consequently it is the power of gravitation which principally causes natural movements of the atmosphere, i.e., winds. Let me specially direct your attention to this, because I believe considerable misapprehension, in respect to possibilities of securing ventilation, has resulted from a somewhat slipshod manner in dealing with this scientific fact; for it is most commonly stated that heat causes air to rise, and that statement of the case has led many to infer that heat causes a suctional influence in a flue. By adequately appreciating the fact that no power is known which largely attracts air upwards, while we are well acquainted with the power of gravitation which attracts it downwards, you may realise that when a fire is lighted at the base of a flue it causes a body of air to expand, which then being lighter than the air around, the

latter is attracted downwards by gravitation and forces the warmer and lighter air to ascend. Such being the case, it is by propulsion and not by suction that the air of the room is changed when a fire is lighted at the base of a flue.

So much importance do I attach to a clear understanding on this point that I ask you to test the correctness of it yourselves; place two large thin glass vessels in a delicate balance, let each be filled with air of equal temperature so as to secure an even balance, now heat the air in one of the vessels, permitting the excess to escape as it expands, and it will be found that the arm of the balance which carries the lighter air will rise—not because it is attracted upwards by the lighter air, but because the heavier air on the other arm of the balance is attracted downwards by gravitation.

People of some scientific attainments with whom I have discussed this question, were inclined to treat it rather as a distinction without a difference, and asserted that where there is a push there must be a corresponding pull, and *vice-versâ*. Theoretically that may be, but practically it has certain limitations. You can pull with some effect by means of a rope, yet with it very little power of push can be exerted; with other substances—with fluids and even more so with gases—considerable force of propulsion may be exercised but very little "pull."

If you suck or draw air out of an enclosed space around which are various apertures, you will find that the incoming air will take the line of least resistance towards that outlet. Suppose the enclosed space to be a large room, with windows or other openings around, some high up, others lower down; if a suctional influence be brought to bear upon the interior, say by an extraction fan near the upper portion of the room, the greatest volume of air will come in by the openings nearest to the fan, and but little change will be effected in the lower portion of the room. Close all the openings high up, and the air will have to travel from greater distances, consequently better change of air within the room will be effected; but if people at the floor level are to benefit by that change they also run the risk of experiencing discomfort from draughts, because when a suctional power is made use of it is difficult to determine where the incoming air will enter, and some may be sucked in directly from the outside, and will certainly cause discomfort in cold weather. The effect is the same whether mechanical power or the natural force of wind be employed. So I think it fortunate that Nature has provided forces which act more strongly in propelling than in extracting air from dwellings.

Other terms used in connexion with our subject have been unfortunate from a scientific point of view, such as "Automatic Ventilation," "Natural Ventilation," and "Mechanical Ventilation," because ventilation is a result brought about principally by the exercise of an ascertainable power. It can never be properly described as "Automatic," "Natural," or "Mechanical." It may, however, be brought about by natural or by mechanical means, and there is, correctly speaking, no such thing or appliance as a ventilator unless there be also power acting in conjunction therewith. It is the power which causes change of air.

To my mind this should be most comforting to architects, because, as natural power must most frequently be relied on for securing ventilation, all that they can do in such cases is to provide suitable means in and about their buildings; for it rests with occupiers to maintain, regulate, and properly employ the means which every architect ought to suitably provide for ventilating his buildings.

In this country, at least, the warming of our buildings is necessary for several months in every year, during which times it is practically impossible to effect ventilation without considering the subject of warming in conjunction therewith.

Whether the lighting of a fire results in the development of a natural, artificial, or mechanical power, is not very material, the important fact is that it does develop a power, and an open fire is most useful, not only because it gives comfort by the heat it evolves, but because the power developed may be usefully employed to assist in securing ventilation.

Those of you who have followed up the subject, know what controversy there has been on the question of upward and downward ventilation. All will probably agree in condemning actual down draught, and I shall

not attempt to defend that; but, what is draught? Why, simply an excessive movement of the air which causes discomfort. It has been ascertained that at a velocity of 4 ft. a second most people would complain of draught, some might at 3 ft., fewer would at 2 ft., and not even the most sensitive person is likely to complain of draught when the velocity does not exceed 1 ft. per second. The temperature of the air will naturally have some effect, so it must be assumed to be normal, *i.e.*, about 60° Fah.

Efficient ventilation of occupied apartments implies the continuous change of air without causing discomfort to or adversely affecting the health of occupants, and after several years observation I cannot detect the least objection to that change being effected in a downward direction, so long as draughts are avoided.

Because air respired and emanating from our bodies is warm, and being warm it is light and will therefore rise, is the argument used by the advocates of what they call upward ventilation, and they term it Nature's method. But, again, I believe this to be the result of an imperfect appreciation of scientific facts.

In the act of respiring, air is expelled with considerable force from the mouth and nostrils, largely in a downward direction, by the contraction of the lungs, and the expired air being warm and light is, at some distance from where it was emitted, forced upwards by cooler and fresher air coming down from above, for the benefit of the individual. Consequently, if our ventilating appliances are so arranged as to secure a constant supply of fresh air above the heads of individuals, and to carry off the expired air at a low level, is it not probable that, as occupants move generally occupy the lower portions of a room than the upper part, they are likely to obtain fresher air from the larger volume above their heads than from that below?

Take an extreme case, such as a compact body of people in an assembly hall—is it not evident that they can be supplied with fresh air better from above than from below, for in the former case the air above is far greater in volume, can circulate freely, and is likely to be more pure than the smaller volume below their heads, which can only move about with difficulty, and must be contaminated by emanations from so many people being congregated together? To ventilate efficiently such a crowded room from below is practically impossible, because even if fresh air be supplied from below, it must become contaminated by passing over the bodies of a number of people before being breathed, but it has been proved to be quite possible to do so from above.

If under such adverse circumstances ventilation can best be secured by downward movement of the atmosphere, surely it can be attained under more favourable conditions for smaller numbers. In an ordinary room, with an open fireplace, where do we find the outlet opening? Why, within 2 ft. to 3 ft. of the floor level. Every one can prove for himself that, unless some greater power be exerted, such as a strong gust of wind or a much larger fire in the same or in an adjoining room, etc., which will only occasionally occur, the sole outlet for air is by the fireplace flue. If any present are not thoroughly convinced of this fact, I beg they will test it for themselves. A lighted match or a piece of thin paper held before every possible opening is all that is necessary, and I venture to say that under normal conditions they will easily detect that air is entering at every other opening and only quitting the room by the fireplace flue. Bearing in mind then that efficient ventilation implies comfort for the occupants of a room, the next question is—Where should any special inlet for air be placed? I say "special inlet" because if air quits the room by the fireplace flue, other air must enter some way or other to replace it; generally you will find it comes in through casual cracks and crevices around the lower portion of the room, and travels in narrow streams direct to the fire, frequently resulting in unpleasant draughts, and the more thoroughly cracks and crevices are closed the more likely will discomfort be experienced from draughts. On this point I shall have something to say later on. At present we are considering an ordinary room, built in the ordinary manner. And although it may appear paradoxical, the best way to prevent draughts is really to admit air more freely. It may involve rather more expenditure of fuel for

maintaining comfortable warmth, but that is better than catching colds. If, however, change of air is too rapid in any room, the one way to prevent it is to reduce the outflow—contracting the sectional area of the outlet flue, because it is the cooler air pressing on all sides which forces the air of the room up that flue. And, as with the same pressure only given quantity of air can be forced through a flue of given section, reduce that section in size, a less volume of air will be passed through a given time under similar conditions. Consequently the velocity with which the air travels from inlet to outlet becomes lessened, a draughts in the room may be overcome, I then the question will arise—Is the room efficiently ventilated? If not then the outlet area must again be enlarged, and a special inlet provided. So we come back to the question: Where shall it be placed? After careful observation and experiment, extending over several years past, I say, without hesitating that it should be on the same side as the fireplace opening, as nearly central thereto as may be, and towards the upper portion of the room (say, about 2 ft. below the ceiling). By providing louvres or other means for distributing the incoming air throughout the upper portion of the room, it will mix with the warmer air rising in front of the fire, and gradually fall and make its way towards the fireplace flue, without causing discomfort because its velocity will be slight, and, coming in contact with the warmed surfaces in the room, its temperature will be raised, while if the fresh air enters freely at the special inlet less air will enter by the casual cracks and crevices. With inlet openings in any other position there will be less diffusion throughout the room, because incoming air will take a shorter and more direct line towards the fireplace, and leave portions of the room less perfectly ventilated. If the arrangement I suggest is right, then downward ventilation with comfort is secured.

Another subject in connexion with ventilation to which I have devoted attention is that of condensation and evaporation. I do not think these results, brought about continuously by variations in temperature and movements of air, have received the consideration which they deserve, for they exercise very decided influences in connexion with ventilation. If the temperature of air is raised it becomes more and more capable of absorbing moisture and becomes specifically lighter than dry air at the same temperature. Again, as it cools by coming in contact with cooler surfaces, moisture is deposited, and becoming specifically heavy, it falls. Vitiated air may for a time be somewhat purified by condensation, but the impurities are deposited upon the cold surfaces with which it comes in contact, and unless those surfaces are frequently cleansed, the animal matter deposited with the moisture in time putrefies, with the result that rooms become stuffy, where such condensation takes place and is not soon removed. You may open the window freely and freshen up the atmosphere for a time, but when again closed up the stuffiness again becomes apparent, particularly if a fire is lighted, because heat assists in volatilising impurities. For this reason I hold the opinion that the most healthy rooms to live in are those of which the walls are not constructed of decorative materials which do not retain heat. In fact I believe that rooms, the walls of which are constructed of pervious materials, are likely to be the best ventilated, even when no special inlets for air are provided. Such walls take heat and retain heat from the fire, they allow heat to pass through them over their whole surface, the air is filtered and takes up heat in its passage through, it enters gradually yet in large volume, and keeps up a thorough change of atmosphere in the room without perceptible draughts.

Some think that the continual passage of air through the walls will in time contaminate them, but with reasonably pure air outside and exercising its known purifying effect, it is more than likely that no deleterious effect upon it would take place, provided always that the walls are kept dry. Wet in the walls would partially close the pores, and probably cause vegetable and, maybe, animal growth. Unless ample provision be made for permitting continuous change of air in a room, nothing else is worse than constructing all walls, floors, and ceilings of impervious materials, or than covering of all surfaces with impervious materials—such as linoleum, linocrusta, paint, &c.

Movement of air outside—in a word, wind—is the active force by which ventilation within doors is principally brought about; consequently, when rooms are unoccupied windows and doors should be freely opened, so that frequent change of air may take place. Surfaces and materials on which deleterious matters have been deposited or by which they have been absorbed, may then become purified, in addition to which, the frequent cleansing of surfaces and materials is necessary if a pure atmosphere within doors is to be maintained. In some places, even with air constantly changing, the air never sweet and wholesome. Urinals and the household water-closets, unless all surfaces are kept scrupulously clean, are unwholesome places which may contaminate the atmosphere of a house. Many of these appliances are still badly constructed, particularly in public places. Generally speaking, at railway stations they are a disgrace. The large surfaces contaminated and infrequently cleansed constantly generate noxious fumes which foul the air, change it never so frequently. Public urinals are capable of great improvement; there should be no angles in which deposit can accumulate, open channel ways should be abolished, each separate urinal should be trapped and provided with a frequent flush of water so directed as to cleanse all surfaces which can be fouled. Properly constructed and maintained little contamination of the atmosphere will take place in and around them. I draw attention to these necessary appliances as being illustrative of our subject, and to impress upon you that mere change of air is not all that is required to secure good ventilation; cleanliness and the continuous removal of everything which defiles the atmosphere is quite as essential, particularly in and about the channels and ducts which convey air from without to within the building.

Let us summarise the points to which reference has already been made:—

1. The deductions of early writers or of those who simply adopt their views should not be accepted without personal examination as to their correctness.
 2. Ventilation is an effect always brought about by the exercise of an ascertainable power; it is never automatic, and no appliance without the employment of power is, properly speaking, a "ventilator," but simply a means by which ventilation may be secured when a power acts to cause movement of the atmosphere.
 3. Air to be serviceable for ventilation must be kept free from defilement.
 4. To secure change of air within doors, both inlets and outlets are essential.
 5. Warm air rises, because it is forced upwards by cooler air, the latter being attracted downwards by gravitation.
 6. Nature's principal method for causing movement of air is propulsion.
 7. By taking precautions to reduce velocity and so to prevent unpleasant draughts, the upward movement of air may reasonably be employed for securing ventilation.
 8. To secure fresh, wholesome air for the purpose of ventilation within doors, condensation on surfaces should be guarded against, and all surfaces, as well as the substance of materials, should be maintained in a clean condition.
- In this country, as I have previously mentioned, it is necessary to employ heat during the four or five months of the year for the sake of comfort within doors, and the open fire has been referred to as a means for assisting ventilation, because it necessitates a flue by which the products of combustion may be carried away. Such flues, even when no fire alight, generally act as outlets and so assist the ventilation of an apartment. To close them by a register or any other means is, therefore, an improper proceeding and should on no account be resorted to. Other forms of heating—say by steam or hot-water pipes or by electricity—do not on their own account necessitate separate flues from the apartments heated, but it is quite as essential that outlets as well as inlets—should be provided if change of air is to take place in apartments so heated.

Judging from the various schemes for ventilating buildings which have come under my notice, I am surprised to find what little attention is given to even the most elementary calculations as to the probable results which will be attained notwithstanding that certain data have been arrived at, which experience proves to be fairly reliable, and so simple that

there is no excuse for neglecting to employ them. Failure, where it takes place, results generally from under-estimating the supply of air necessary for securing efficient ventilation, and from the employment of restricted areas of inlet or outlet channels, openings, or ducts.

An ordinary room is provided with one fireplace flue, and, as previously stated, when a fire is lighted, that flue is practically the only outlet for air from the room. Consequently, by ascertaining the velocity of air passing up the flue and the sectional area of the flue, it is easy to find how much air will pass through the room in a given time.

Several influences will be at work at varying times which will affect the velocity of air passing up the flue, such as more or less fire in the grate, more or less force of wind outside, larger or smaller inlet openings, etc., but under medium conditions a flow of about 5 cubic ft. per second may be taken as the average volume passing up an ordinary 14 in. by 10 in. flue. Kindly note that I give the volume at about 5 cubic ft. I do this for the purpose of simplicity, and because it is near enough for practical purposes and can easily be remembered. If 5 ft. be multiplied by 60 times 60, the number of seconds in an hour, the result—viz., 18,000 ft.—will be the volume of air passing through the room in that time, and if change of air be demanded at the rate of six times per hour, the cubical capacity of a room with only one fireplace flue should not exceed 3,000 ft., say 20 ft. by 15 ft. by 10 ft.

A point which requires consideration is the size of a special inlet relative to that of an ordinary fireplace flue. A good rule is to have it of ample dimensions with easy means for its regulation. It is then the fault of the occupants if care be not taken to adjust it to requirements. The difficulty, however, is that people are generally careless in paying attention to so simple an appliance—on a windy day the opening will be closed to prevent discomfort from draughts, and no one thinks of opening it in calmer weather; therefore, when the inlet is placed as I advise—on the same side as the fireplace and as nearly central thereto as possible, about 2 ft. below the ceiling—a clear opening of about one half the area of the outlet flue will suffice, for the following reasons:—

1. If the inlet is simply through an external wall there will be less friction than in the long outlet flue, therefore the velocity can be greater.

2. Because with a properly-formed and louvered inlet the additional velocity in the upper and unoccupied portion of the room will distribute the air throughout better than if entering at low velocity.

3. Because variations in the force of wind outside will not be so much noticed within the room when the area of inlet-opening is not excessive.

But because of the well-known and frequent variations in the force of wind outside I have devised this little automatic regulator. You will notice that in calm weather the central flap will stand stationary allowing some 2½ in. of space for the air to pass in, but as the force of wind increases the flap will be deflected and the available space is thereby reduced proportionately. A difficulty which took some time to overcome was, so to hang the flap that its movements could take place without producing a clicking noise; after several attempts I believe this has been successfully accomplished, consequently the appliance may be usefully employed to avoid the necessity for any personal regulation, and I believe it should go a long way towards solving one of the difficulties hitherto experienced in securing constant and adequate ventilation without personal attention. Only one size is made, suitable for a room with a single ordinary flue, two or more of the automatic inlet regulators being necessary for larger rooms. Attempts have previously been made in the same direction, but the difficulty of overcoming the annoyance of clicking noises in appliances with movable parts has militated against their adoption. Having no pecuniary interest whatever in the appliance, I may safely commend this automatic inlet regulator to your favourable consideration.

Much more might be advanced as to the necessity for considering details in connexion with the employment of natural means for securing efficient ventilation, not only in domestic buildings but also in those for more public purposes. Let me again remind you that doors and windows can, and should, be more generally

regarded as legitimate means for securing change of air within buildings. Windows should be constructed so that they may with ease be opened and closed, and that whenever practicable they should be freely opened, particularly at times when the buildings are unoccupied. Although the many appliances called ventilators, employed when open fires are not employed, only permit of the passage through them of a limited amount of air—for, as a rule they are too small in size, and are only serviceable when there is sufficient movement of the outer atmosphere—it fortunately happens that in this country some movement is taking place more frequently than not, and one advantage secured by the use of ventilating appliances is that a certain amount of change of air takes place through them almost continuously. For continuous occupation however the change of air which takes place when such appliances alone are depended upon, is generally inadequate—a few figures will easily prove this. Ascertain the cubical capacity of the building and the total minimum area of the free openings in the appliances, and find the time required for the volume of air contained in the building to pass through the openings say at a velocity of 5 ft. per second, and unless the whole volume can pass through in twenty minutes, i.e., at the rate of three changes per hour, efficient ventilation will not be secured for reasonable occupation of the buildings during any considerable length of time. In calculating the amount of change of air required in a building it is safer to take as a basis the cubical contents and number of changes per hour than to take the number of people to be accommodated and allow so many cubic feet of air in a given time for each, because it is important to remember that the building itself has to be ventilated as well as that the occupants require change of air.

For this reason I have come to the conclusion that, unless it is considered worth while continuously to ventilate buildings when mechanical means are provided, there is risk of failure, because when the mechanism is stopped change of air ceases, and although when the machinery is restarted change of air may soon be effected, the long period of stagnation permits the materials of and in the building to cool down; condensation then takes place on all exposed surfaces and other influences deleterious to the atmosphere of the building may, for a considerable time, result.

For buildings such as hospitals which are continuously occupied and throughout which it is important that continuous and ample change of air should take place, together with uniform heating, I thoroughly believe that mechanical means will in time become an absolute necessity. Having recently dealt with this subject at the R.I.B.A., I will only now say that to successfully ventilate a building by mechanical means implies a considerable knowledge of the various appliances available—there must be no stinting of space or of materials necessary to secure the most thorough and economical results. A change of air up to ten times per hour must be insisted upon, the plant in all important features should be duplicated and the most economical power available should be employed. All air ducts and channels should be of ample sectional area so as to reduce friction to a minimum and so that they may be readily cleansed; both inlets and outlets must be arranged with judgment and properly proportioned. The air must be taken in at a point most free from contaminating influences, it must be screened, brought to a suitable temperature, and hygrometric condition, and passed on to the several apartments required to be ventilated, without the possibility of its becoming deteriorated until it approaches the outlets and is again discharged into the open, through properly constructed outlets so that movements of the outer atmosphere may not exercise any influence upon its outflow.

For some time there was considerable controversy as to whether methods of propulsion or of extraction were to be preferred. I believe that by far the majority of those who have had practical experience in the matter are now more favourable to propulsion. One of the most serious mistakes has been the combination of the two systems, for they cannot possibly be worked together economically, and I fear that even if expense were no object, imperfect results only can be attained by employing conjointly means for securing extraction as well as propulsion.

Experience of the practical working of well-proportioned installations of Plenum ventilation

by mechanical means has proved to me that it is possible to secure continuously, and at a reasonable expenditure, efficient ventilation such as is quite out of the question when natural means alone are relied on. In saying this I on no account undervalue the necessity for taking advantage of the means which Nature places at our disposal, because I realise that for the majority of buildings anything in the way of mechanism for securing ventilation is out of the question at present, although I venture to predict that, as time goes on and the possibilities of employing mechanism for the purpose are more appreciated, an architect's training will not be considered complete unless he has made himself fully acquainted with the principles and appliances by which buildings may be successfully ventilated by mechanical means.

Mr. John Murray, in proposing a vote of thanks, said he had very little criticism to offer upon such an excellent paper, which would assist students in studying this important and intricate subject. They all knew that Mr. Henman advocated the plenum system of ventilation, but the great difficulty about that system when applied to ordinary buildings was in getting the appliances so arranged that the shafts or ducts could be properly cleaned. He would like to know how a small shaft could be arranged so that it could be adequately cleaned. It was quite possible to keep them clean in large institutions, such as the Victoria Hospital at Belfast, but the difficulty, he felt, was with small installations. In most systems of ventilation the great difficulty was to get sufficient personal attention devoted to the regulation of the mechanical appliances, and he felt that no system of ventilation could be satisfactory unless it was continually attended to and regulated. One might provide a carefully arranged and adequate system, but the people who had to regulate it did not attend to it, and the result was not satisfactory. He would like to know whether Mr. Henman advocated the use of ventilating electric fans in conjunction with the plenum system. An electric fan might be of assistance, but Mr. Henman seemed to suggest that it was not necessary. [Mr. Henman: As a propelling power or suction?] As suction. He would also like to know Mr. Henman's views upon inlet ventilating stoves, where the air was admitted about 2 ft. above the outlet opening, also how much air passed through an ordinary 9 in. brick wall, plastered on one side. Did Mr. Henman consider one fire flue in an ordinary London dwelling sufficient to ventilate properly a room, provided that sufficient inlets were supplied? In the case of inlets to an ordinary dwelling room, how high should they be from the floor? A great difficulty in London, and perhaps in most towns in England, was the screening of air which passed into a room, and it seemed to him that no house could be properly ventilated unless there was a screen arrangement connected with every inlet. That appeared to be an expensive and very intricate matter to arrange, but he felt we should never get adequate and efficient ventilation until some simple mechanical device was invented to screen the air at its entrance and before passing through such an arrangement as the inlet shown by Mr. Henman. They all knew that air could be purified in the case of large buildings, but the difficulty was to screen and cleanse it through small inlets into ordinary rooms. Another difficulty in connexion with plenum ventilation was the regulation of the degree of heat. The plenum system or the warm-air system was very largely used in American houses, and he knew from the experience of friends of his that American houses were not always healthy, because they were frequently overheated, and the air was not always pure, because it was carried through the buildings in small ducts, which became dirty, and the air was thus tainted. Mr. Henman suggested that the external air might be purified, whereby it might be admitted in a purified state into our domestic buildings, but he (the speaker) was afraid that that would never be effected in towns.

Mr. H. P. G. Maule, who seconded the vote of thanks, said there were one or two points that naturally occurred to one in listening to such a paper. Take the case of an ordinary dwelling house: it seemed to him that it would be rather difficult to insert a ventilator of the kind Mr. Henman had shown in the walls of a dining-room or drawing-room, and he should like to know if Mr. Henman had any special method of dealing with an ordinary dwelling house where

there was some architectural treatment of the walls. There was one point which seemed to be always overlooked, and that was the education of the public in the matter of appreciating fresh air coming into rooms through windows. If one accustomed oneself to live in a house with open windows, any other condition could not be tolerated for long. One learnt to appreciate purity and freshness of air so much that in entering a room one could tell at once whether the window was open or not. He ventured to say that he could go into a room with his eyes shut and could tell in half a minute whether the windows were open or shut, and that because he accustomed himself, winter and summer, to wide open windows, and he thought that architects, in ordinary domestic work, were in error in providing anything like mechanical methods of ventilation. It was a matter of the education of the individual rather than the ventilation of the house by mechanical means. The point raised by Mr. Murray as to the cleansing of ducts seemed to be the crux of the Plenum system. Mr. Henman had said it was of the utmost importance that the flues should be kept clean, but, human nature being what it is, unless the flues were sufficiently large to enable people properly to clean them, they would in course of time most certainly become foul. If the extract of a room was by the fireplace flue and the inlet to the room was only half the size, surely the amount of ventilation one would get in the room, supposing the windows were shut, would be quite inadequate on the assumption that there were more than a certain number of people in it. If the number of people in a room was increased, there ought to be special provision for allowing more air to come in. He did not see how the insertion of one or two ventilators in the walls of a room would adequately ventilate that room unless the windows were opened too. The paper they had heard was a very interesting one, which they would want to turn to for information again and again.

Mr. W. J. H. Leverton asked Mr. Henman whether he found his methods of ventilation sufficient when gas was burning. In ordinary circumstances during the day, with the air coming in at an opening 2 ft. below the ceiling on the side of the fireplace, the air would be properly diffused, and would find its way out of the chimney, but with the ordinary gas burners creating fumes he was afraid that the arrangement recommended would not be sufficient.

Mr. Alfred Burgess said that Mr. Henman had made some very clear distinctions. A ventilator originally was a man who turned a wheel, and it was interesting to see how correct was Mr. Henman's statement that proper ventilation could not take place unless there was some mechanical force to aid it. In mechanical ventilation there were really three processes which might be adopted, and he did not agree that a system of propulsion and extraction would not work satisfactorily. The conclusion of the committee appointed to consider the ventilation of the House of Commons was that the ordinary propulsion of air into a building should be assisted by extraction. Almost every mechanical system of ventilation was apt to be called a plenum system, and it was necessary to define the three processes he had referred to. There was the system which consists in putting air into a building at an excess of pressure on that outside the building; there was also that system of drawing air through a building so that a slight vacuum might be created; and there was the conjunction of the two, which was used in the House of Commons, i.e., putting the air in at one end by a fan and extracting it at the other. By this means they avoided excess of pressure and also a vacuum, and got instead an equilibrium, which was a good name for the third system. He thought it was a good thing that architects, when discussing mechanical ventilation, should make use of definite terms in regard to the different systems which they were describing.

Mr. A. Needham Wilson asked Mr. Henman what he thought the height of rooms should be in houses where the system of ventilation he favoured was adopted. One of the difficulties one had to deal with was that the average client insisted on excessively high rooms, and Mr. Henman's conclusions were necessary for their efficient ventilation. Mr. Henman's statements seemed rather to reverse the accepted order of things; if we want to let out foul air from rooms we must open the windows at the bottom, and if we want to let fresh air in we must open them at the top.

The President, in putting the vote of thanks to the meeting, said that two things had struck him in the course of the evening. It was cheering to hear from an expert like Mr. Henman that the much-abused open fire was a satisfactory means of ventilating a room. Mr. Henman had heard so often about its wastefulness and that we ought to use stoves and radiators that it was pleasing to hear for ordinary dwelling rooms we could make use of the open fire. With regard to the ventilator, a number of which Mr. Henman had shown, he understood it had to be put about 2 ft. from the ceiling and on the same side as the fireplace, but in most houses the fireplace being on the inner wall, he did not quite see how the ventilator was to connect with the open air where the chimney was in the centre of the house. As far as he could gather from the paper, the jerry-built house was the one most satisfactorily ventilated. Plaster made of mud and bricks made of sawdust produced perfectly-ventilated houses without any of these mechanical means!! Any mechanical appliance that depended on people for regulation and attention was bound to get out of order, for they would not be attended to. Under the new by-laws which were insisted upon, ventilators had to be put in, but as soon as any draught was felt the occupants invariably closed them, and depended on doors and windows for ventilation. That was one thing that was not insisted on so much as it should be with regard to ventilation, and that was keeping walls and surfaces of rooms absolutely clean. There was no doubt that if a room were kept closed up for any time the walls would become dirty and foul, and the furniture too. To a certain extent he agreed with Mr. Maule about the open window, but it would be a difficult matter to persuade people in a city like London to keep open their windows. The great objection seemed to be how to keep out the soot, dust and fog, which spoilt almost everything in a room.

The vote of thanks having been very heartily agreed to.

Mr. Henman, in reply, said that his experience had been contrary to that contained in what were called the recognised works on ventilation. He found that nearly everyone writing on the subject went back to Dr. Reid, although Dr. Reid made the most careful experiments with the apparatus he was using to obtain in his day, nevertheless in regard to many of the important statements and deductions he made he was scientifically wrong, and it was for that reason that he (the speaker) had put before them the particulars he had hoped he had given his reasons sufficiently clearly, and that they would be able to see that Dr. Reid was wrong in the conclusions he arrived at. As to the question of keeping the air clean, i.e., flues, ducts, and flues clean, in any system of ventilation, mechanical or natural, it was a question of having the flues get-at-able; unless the flues were kept clean good ventilation could not be obtained. Flues should be so arranged that they could be swept, and "if they are arranged so that they can be swept, then sweep them. As to walls being pervious, and as to the amount of air that would come through, several experimenters had tried to ascertain this. It differed with every class of material and every surface put upon a wall, but it was surprising what an enormous amount of air came through the walls of an ordinary room. He had been in rooms where he had known that the bricks and the materials were thoroughly pervious, and that the walls of these rooms had always been fairly sweet and clean. On the other hand, some thirty years ago he took an office on the walls of which was a thickly varnished grained paper, which he could not endure that sort of thing, he had painted a dark green. There was linoleum on the floor and the ceiling was painted, and uncomfortable was the room that he had given up the office for that reason. Air did not enter only through cracks around the doors and windows, or by a special inlet over the top situated on the opposite side to the fireplace. It was one of the most uncomfortable rooms he had ever been in, stuffy without a fire, very draughty with one; and wherever you sat on a cold day you were in a draught, you could not prevent it. The more you opened up the pores of a room, the more this was the case. Air would come in, and if it did come through the materials it would come through cracks or windows, and cause a draught in its passage across the room to the chimney. He had told them that air heated in a

ascended because it was propelled upwards by the surrounding cooler air being attracted downwards by gravitation; the outer air was then pressing in all directions, seeking entrance to the room; if openings were few and of no great size, air would be forced in thin streams rapidly in direct lines to the fireplace, probably causing unpleasant draughts, and yet not efficiently ventilating the room. With larger openings more distributed, the better results might follow, but with one or two properly constructed openings on the fireplace side about 2 ft. below the ceiling, the incoming air might be well distributed throughout the upper portion of the room, and would return towards the fire at low velocity from all parts much in the same way as it would if it came in through porous walls, floor, and ceiling. As to propulsion and extraction being combined, it was one of the safest of mistakes. It was a fallacy altogether, to begin with, that the two could be used economically. It was not effective. In connexion with this room they were occupying, if there were a propelling fan of sufficient power to force in a volume of air equal to a change throughout of, say, ten times an hour, all that would be necessary for doing it effectively would be to properly dispose and proportion the inlets and outlets. The addition of an extraction fan could not possibly help matters, it would simply entail extra expense; but supposing that the propelling power were not sufficient to effect the required change, then it might be supposed that supplementary power would be necessary; yet it should not be in the direction of extraction, because if air from the apartment were forcibly removed, other air must enter, additional to that supplied by the propeller, hence it must be drawn from somewhere else probably through casual cracks and crevices, resulting in draughts, or it may be sucked from impure sources. Under such conditions the ventilation of the apartment could not be said to be efficient. If, however, instead of supplementing a propelling power by one of extraction, the propelling power were augmented, better results might be expected, provided the inlets and outlets were properly arranged and proportioned. Propulsion and extraction could not be used together effectively. It had been done in the Houses of Parliament and the Law Courts, where the ventilating appliances were not sufficient, and extraction fans had been put in in addition to propulsion; but people complained of draught, and that was because the air was being drawn from some position from which it did not require to be drawn, and thus draught was caused. Generally it was adopted as a makeshift; the original means provided having proved inadequate, supplementary power had been made use of, too often in the wrong direction. At the Victoria Hospital, Belfast, and at Birmingham Hospital the rooms were perfectly ventilated, at a considerable distance from the propellers, without any extraction whatever. As to the position of the ventilator he had shown that evening, when the fireplace was on the internal walls, generally there was a recess, and if the fire prevented the ventilator being placed on the chimney breast, then it could be put in the recess—as nearly central to the flue as possible, he said. In his own rooms he had put a ventilator on each side of the chimney breast, and he had been complimented on the efficient way in which his rooms were ventilated. As to the height of rooms, that was a point about which his clients rather laughed at him, but he had been pleased to find that a number of architects who had built houses for themselves had low rooms, but it had been suggested to him that that was because architects were not troubled with much money, and they had low rooms in order to keep down the expense. He was inclined to think that many of them realised that, provided there was not a lot of gas burning—gas fumes were a difficulty, but he was using electric light much more generally now—low rooms were better for comfort and good ventilation. They reduced the cubical capacity by having low rooms, and if they used a propelling force for ventilation it would cost less to change the air often with a small cubic capacity than if the cubic capacity were larger. Or the air at a given power could be made to pass through a small room more quickly than in the larger room. As to the height of the rooms, it was a question of taste, and it must depend on the size of the room to get the right proportion. He had to enlarge an old house, and the height of a room not half as large

as the one they were then in was 7 ft. 4 in., and that did not seem an uncomfortable height, and a large class was held in the room. People had high rooms, he thought, because of gas fumes. If one mounted a ladder in a room in which gas had been burning some time, they would realise what a state the air got into, and all that foul air having no means of escape, had to come down in the ordinary way, but if the ventilator were at the upper part of the room the fresh air was constantly sweeping that away. Any opening, other than into the fireplace flue, served as an inlet for air whenever a fire was alight, and if the opening was high up in the fireplace, air only passed away by such an opening under most favourable conditions, and back flaps were necessary to prevent the egress of smoke from the fire. The air at the top of the rooms in his house was constantly fresh.

The Chairman announced that the next meeting will be held on November 25, when Messrs. J. T. Micklethwaite and E. Prieoleau Warren would deal with the subject of "Excavations in Westminster."

The meeting then terminated.

THE SURVEYORS' INSTITUTION:
PRESIDENT'S ADDRESS.

The first meeting of the new session of the Surveyors' Institution was held on Monday evening at No. 12, Great George-street, Westminster, S.W., Mr. H. T. Steward, President, in the chair.

Mr. Currey, Hon. Secretary, read a list of donations to the Library and the Library Fund, and on the motion of the Chairman a vote of thanks was accorded to the donors.

On the motion of the Chairman, Lord Armstrong, of Newcastle-on-Tyne, was elected an honorary member of the Institution.

The President then read his opening address, the first part of which dealt with the question of housing.

The Housing Problem.

He said that out of a total population of 32,678,213 persons in England and Wales, rather more than 15,000,000, or nearly one half, are dwellers in London and seventy-five other great towns. The towns have to find quarters on a limited space for nearly half the population of the Kingdom. London alone, with its 74,839 acres, has within it 4,536,541 persons, dwelling in 1,019,646 separate tenements, exclusive of the City proper. The recent census showed that of these 1,019,646 tenements 672,030 are tenements of fewer than five rooms, 149,524 being single room tenements, of which 60,421 were occupied by one person only, 48,341 by two persons, 23,680 by three persons, 11,279 by four persons, 4,001 by five persons, 1,257 by six persons, 354 by seven persons, 103 by eight persons, and 58 by nine or more persons. The latest returns available at the moment showed that eight of the principal companies have in their dwellings some 120,000 persons distributed approximately as follows:—

1. Metropolitan Association for Improving the Dwellings of the Industrial Classes	6,000
2. Trustees of the Peabody Donation Fund	19,000
3. Improved Industrial Dwellings Company	29,000
4. Artisans', Labourers', and General Dwellings Company	42,000
5. Victoria Dwellings Company	4,500
6. East-end Dwellings Company	5,600
7. The Four per Cent. Industrial Dwellings Company	4,200
8. Guinness' Trust	8,500

The Metropolitan Board of Works and the London County Council have made, or the latter body is in course of making, provision for some 70,000 persons, and the railway companies, and other commercial undertakings have provided under their Acts for about 15,000 more. The great landlords of London, and the Ecclesiastical Commissioners, and the borough councils have also materially aided in the erection of dwellings for the working classes.

With regard to the class of persons who occupy the dwellings provided, it was interesting to notice by the return of the London County Council that in thirteen of their schemes, out of 1,458 heads of families in their dwellings on December 31, 1899, there were persons of over 100 distinct callings, of which about half may be classified as artisans, presumably earning good weekly wages; while a considerable number of the other half belonged to the class of skilled labourers, but included 7 clergymen, 32 clerks, 73 policemen, 39 postmen, and 26 salesmen. While the population of London was, of course, increasing as a whole, it was

satisfactory to find that the ratio of increase had declined in the last five decennial periods from 18'8 per cent. in the census period 1851-61, to 7'3 per cent. in the period 1891-1901. According to the last census the population of Shoreditch since 1891 had decreased 5 per cent., Finsbury and Westminster 9 per cent., Holborn 10 per cent., and the City 30 per cent., while the population of Chelsea, Bethnal Green, and Poplar had increased 1 per cent., Southwark 2 per cent., Islington 5 per cent., and Stoke Newington 7 per cent. The places in which a marked increase had taken place were Greenwich 20 per cent., Lewisham 45 per cent., Fulham 48 per cent., and Wandsworth 50 per cent. This increase was, however, only to have been expected, as there was vacant land in these parishes, and such districts would until quite recently have been deemed suburban.

In spite of the great increase in the facilities for locomotion and the cheapening of transit in recent years, and the disposition to remove factories to the suburbs, while London remains the centre of the life of the country, there must necessarily be a large number of the working class population who, not only by inclination desire to, but by the nature of their callings must, reside in the central districts. The working class population in these districts where, even under the best conditions, their surroundings must be of a somewhat depressing character, would be materially benefited by removal to an open or more cheerful neighbourhood where they might feel the influence of better surroundings, and it was to be hoped that the efforts of the London County Council in this direction might meet with the success they deserve. We must all have noticed the recent erection, in the nearer suburbs, of rows and rows of small flats or double tenement houses, of good exterior, and with internal fittings and conveniences beyond the dreams of twenty years ago. In these dwellings could be traced the influence of improved housing upon the habits of the occupants—in the rivalries in flower-beds and white lace curtains, and in general attention to external appearances; but they were, generally speaking, occupied by those in more or less regular employment at fixed wages.

As to lodging houses, in addition to those already provided, the London County Council was, he believed, about to erect a lodging-house of the superior kind for women on the south side of the Thames; while the Directors of Rowton House, he understood, have had the subject under consideration for some time past, and would, no doubt, as opportunity offered, erect one of their Rowton Houses for women. It was to be hoped that such a building might prove a success, and be the forerunner of others, as a house of the kind would be a great benefit to women, and should tend to prevent the overcrowding that at present exists in some parts of London. By overcrowding he did not mean the mere density of population. It was the overcrowding in particular rooms that was the evil. No doubt at the present time, in spite of the law, there were a large number of persons living in houses that were overcrowded in direct contravention of the Public Health Act, 1891. Putting the law in force often meant driving people to the streets or to the workhouses, and for this reason the magistrates hesitated to use the full powers of the law, and frequently decline to make closing orders.

Rural By-laws.

"Before I leave the subject of working-class houses," continued the President, "I should like to add a few words about the by-laws now pretty generally adopted in rural districts in so far as they affect cottages in the country or in proximity to towns. Many of the councils in rural districts, with, no doubt, laudable intentions, have adopted model by-laws with reference to houses framed on the London Building Act, a statute totally inapplicable to cottages in the country, with the result that landlords and others are discouraged from providing them, as the cost of building is altogether disproportionate to any return that can be obtained. It is worthy of note that one of the judges of the High Court has lately been, and I believe still is, in conflict with a rural authority upon the subject, and I trust this may lead to some alteration in the future by a remodelling of such by-laws as those to which I have alluded.

Increase in Parish Rates.

"The large increase in the parish rates of recent years is a matter of much concern to

many, and affects the question of housing. It is impossible to contemplate, without misgivings as regards the future, the state of things in boroughs like East and West Ham. In the former the rates have reached 8s. 8d. in the £, while in the latter they have arrived at the unprecedented amount of 9s. 8d., though Southampton and Wakefield run this close with 9s. in the £. I notice in the recently-published Report of the Public Works Loan Board that the outstanding advances of the Board to the Corporation of West Ham, in connection with the Education Act alone, represent something like the sum of half a million. The population of West Ham is largely dependent on works and factories which seem to show a tendency to migrate further afield, probably in order to escape the burden of such rates as these. Surely we must ere long reach, if we have not already done so, the limits of taxation. In the year 1874-5 the total Metropolitan rates stood at 4,271,538s., and the outstanding loans at 21,009,799s. In the year 1900-1 the figures were, rates 11,740,320s. and outstanding loans 58,130,587s. This is a somewhat alarming increase, and it is not to be wondered at that some lending bodies, of which the Public Works Loan Board is the chief, are arriving at the conviction that the local indebtedness has, in some instances, now reached such a figure that the rates no longer afford a sufficient margin of security for advances of public money; indeed the Board has issued a warning to borrowers that future applications will probably not be entertained unless a reduction is shown in the rates levied. In pursuance of this policy, the Board has lately refused a good many applications from various boroughs and district councils in England and Wales.

Standard of Public Taste.

"I think everyone will admit that there are signs on every side of a general rise in the standard of public taste. While we may not have improved, speaking generally, upon the examples set us by Wren and Chambers in our public buildings, everyone must be impressed by the immense improvement in our domestic street architecture in recent years. All around us is rising a new and greater London. I cannot wholly agree with the President of the Architectural Association in his recent address, for I should be sorry to see the present picturesque irregularity of our street architecture superseded by the uniformity which characterises many of the much-lauded streets of Berlin. Let us have spacious streets and fine vistas by all means. These can be secured by a regulation of street lines, and the rest may be left to the general rise in the standard of public taste—with, of course, some control as to dealings with special sites. All will agree that the London County Council has done much to improve our modern London by the widening of our streets and the opening-up of new thoroughfares. The days are, I hope, far distant when London will be disfigured by monstrous steel frame erections like those of Chicago and Manhattan Island. We, too, have to deal with sites of enormous value, necessitating building to the utmost possible height, but, in common with some other cities, we have decided that there is a height beyond which buildings shall not go. If we should resort to steel frame buildings, as I think is quite possible before long, it will be for the sake of rapidity of construction and the saving of space; but if this is to be of any practical use some modification in the interpretation of our Building Act would appear to be necessary, for there can be no necessity, in a building supported entirely by steel construction, that the walls, which practically carry nothing but themselves, should be of the same thickness as though they carried many stories of superincumbent weight. The steel construction system, like most others, has no doubt some drawbacks and some advantages; but economy of material and the consequent saving of labour, as well as of space, would be the main advantages of the system. There seems to be a prejudice in this country against a large employment of ironwork in the construction of buildings, principally on the ground of its behaviour when exposed to great heat; but I do not think the last word by any means has been said on the question of fireproof construction and on the precautions that may be taken to protect ironwork from the effects of a conflagration.

The Building Trade.

"I fear it is true that the rise in wages in the

building trade which has taken place during my memory does not alone account for the great increase in the cost of building during the same period, for it is undeniable that the rise in wages has been accompanied by a great decline in the quantity of work done by a man in a day. Take two oft-quoted cases for example, viz., the Westinghouse works at Manchester, where, it is said, the bricklayers laid 1,600 bricks a day per man on part of the works; and the case of the Great Northern Railway at Manchester, where the men, it is said, laid 1,760 bricks per man in hydraulic lime-mortar in a nine hours' day. There were perhaps exceptional circumstances to account for such expedition; I do not know, but what we do know is that the bricklayer does not lay as many bricks in a day as he used to do, and it is declared by many who ought to know that 400 or 500 bricks per day per man is now regarded as a fair average, as compared with 800 to 1,000 bricks per day per man some years ago. The builders, with whom as a class I have perhaps a somewhat special acquaintance, have naturally attempted to counteract the combined influences of increased wages and decreased work by the adoption of every labour-saving appliance that presents itself. I have sometimes thought that a modern builder's yard might form a fascinating subject for a paper, for the extent to which manual labour has been displaced by machinery in many shops would be instructive reading. This has been done, not from any desire to injure the workman, but because the saving of time and the rapid turnover of capital are necessary to the existence of a business of the kind under modern conditions. It is for this reason, among others, that I think, as I have said, that we may some day see the adoption of American methods on a large scale. Strikes there will and must always be as long as human nature remains what it is, but the establishment of Boards of Conciliation for the London district has, I understand, done a good deal towards the immediate settlement of disputes, by bringing masters and men together in conference. These Boards have been the means of settling a considerable number of the irritating inter-trade disputes as to allocation of work, which have so often resulted in such serious losses alike to workmen, employer, and client. In cases where the dispute cannot be settled in conference, the Boards, under their constitution, can appeal to the Board of Trade. This arrangement is at present optional; but I understand that the men show a disposition to agitate for a compulsory reference in all cases of failure to agree. What this might come to mean under certain conceivable political conditions is too obvious for comment. As to the extent of the evil, I see from the handbook for 1904 of the London Master Builders' Association, that according to the General Report of the Labour Department of the Board of Trade there were no less than 39 strikes in the building trade in 1902 for an advance in wages, in which 5,356 persons were involved directly and indirectly, and which had an aggregate duration of 115,860 working days, representing an enormous sum as loss of wages. Anything which can be done to prevent such a loss must be to the real interest of all concerned. The decision in the Taff Vale case has deprived the men of one of their most potent weapons for enforcing their demands, but it must not be forgotten that it is two-edged, rendering the masters' associations as liable as the men's to actions for damages for anything done in their corporate capacity. This is not the place to comment upon this important judgment; but it is to be observed that even the champions of trade unionism admit its equity as a matter of abstract law.

Ancient Lights.

"While on the subject of the various cases which add to the risk and expense of building in towns, I will refer very briefly to the recent decision in the now famous case of *Colls v. Home and Colonial Stores*. It is too much to say, as some have held, that the judgment has put the law as to ancient lights on a clear and definite footing. The most that can be stated is that it has cleared the air by sweeping away many contradictory decisions. We now have it, on the highest authority, that some of the decisions were based on misconceptions of the effects of the Prescription Act, that, in some, findings of fact had been adopted as principles of law, and that in others, as the Lord Chancellor stated in his judgment, it had been erroneously assumed that there was inherent in the dominant

tenement a sort of proprietary right in light itself, whereas light, like air, is the common property of all to enjoy, and it is the exclusive property of none. By this judgment it is settled that an action will not necessarily lie against the servient owner because, owing to his operations, the dominant owner has a light than before. There must be an actual and substantial deprivation of light, such as to make the premises less suitable—not for special and extraordinary purpose, but for ordinary purposes of men living together in crowded centres of population. It must, in fact, be a deprivation of such magnitude as amounts to a nuisance. It is held, further, that a mere diminution of light gives the party affected no right to an injunction, but merely a right to damages. As a result of this decision we shall in future, I hope, have our eyes often offended by the unsightly boards bearing the menacing words "Ancient Lights," which are apt to be used as a lever for virtual blackmailing in cases where persons are timid or fearful of the risks of an action at law. Members are no doubt aware, the Council of this Institution and the Royal Institute of British Architects have for some years been so impressed with the necessity of relief by legislation to the servient owner that with no little labour and expense, they prepared a private Bill which, so far as its provisions were concerned, would have had the same effect which has now been brought about by the recent interpretation of existing law. But there still remains, in my opinion, the necessity for a special technical tribunal (for which we made provision in the Bill) composed of persons familiar with the difficulties or arrangement and construction which beset building operations in large cities and working on settled and consistent lines for dealing with questions of fact. Before leaving this subject I should like to express our obligations to Mr. Howard Colls for his courage and persistence which he showed in fighting this matter to the bitter end, and to the members who, I am sure, endorsed the action of the Council in deciding to assist Mr. Colls in meeting the heavy costs he has incurred in battle with an evil which threatened to obstruct greatly building operations in London and other large towns."

In conclusion the President referred to the retirement of Mr. Penfold, who, commencing from the earliest days of the Institution, filled the office of honorary secretary for this six years, and to the election of Mr. Currey as his successor.

On the motion of Mr. C. Bidwell, seconded by Mr. Howard Martin, a hearty vote of thanks was accorded to the President for his address.

Presentation to Mr. Penfold.

The President said he had now to perform what was likely to be his most pleasing duty during his year of office. He found entered in the minutes of the Institution of July 18, 1874, the following:—"Resolved, that Mr. J. Penfold be appointed Hon. Secretary of the Institution." From that date until the end of last year Mr. Penfold continued to discharge the duties of that important office. The Council accepted his resignation last year with the greatest possible regret—for his was the guiding hand which had steered the Institution through the troubles and difficulties of its early career, and his wise counsel had always been at the command of the Institution. It was, therefore, felt that mere words were not adequate to express the feelings of the Institution or the appreciation of the members of his services, and it was decided to give a more tangible expression of the regard which he was held by asking him to sit to a portrait by Jacob Hood for a presentation portrait. Though no longer Hon. Secretary, Mr. Penfold had not been allowed to escape from the trials and duties in connexion with the Institution, and they would still have the benefit of his wise counsel and advice. At the suggestion of the Council Mr. Penfold had been appointed to a position of "less freedom and more responsibility." He would not dilate on the esteem and regard in which Mr. Penfold was held, but he would express the earnest hope that would be with them for many years to come.

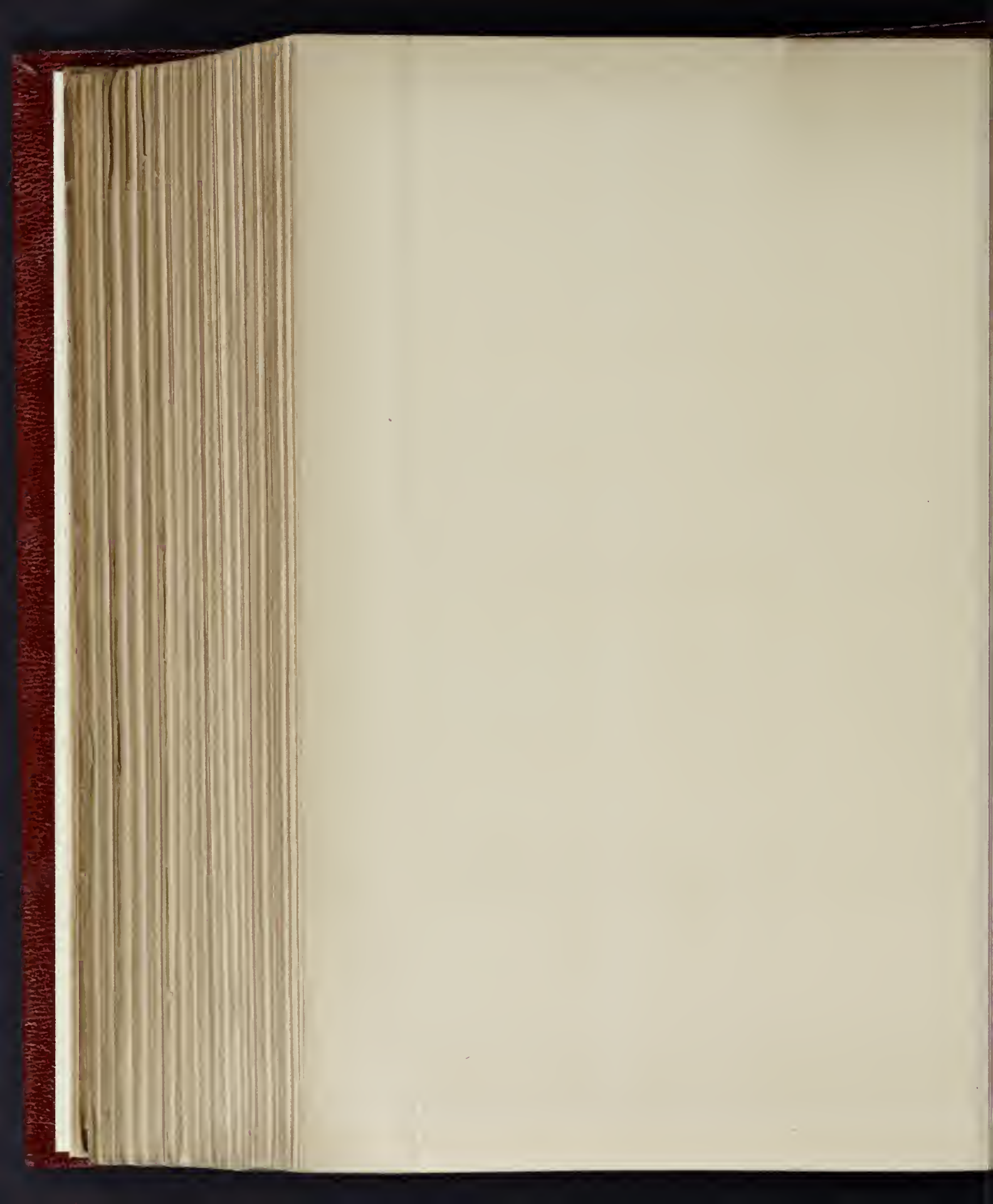
The President then unveiled the portrait, and, in the name of the Institution, presented it to Mr. Penfold.

Mr. Penfold, in reply, said he was overjoyed by their generous recognition of any service he had rendered the Institution. He would



44 PHOTOGRAPHIC CO. 45 1911 MADISON STREET PETERB. MASS. U.S.A.

DETAIL OF THE PRINCIPAL ENTRANCE, PISA CATHEDRAL.





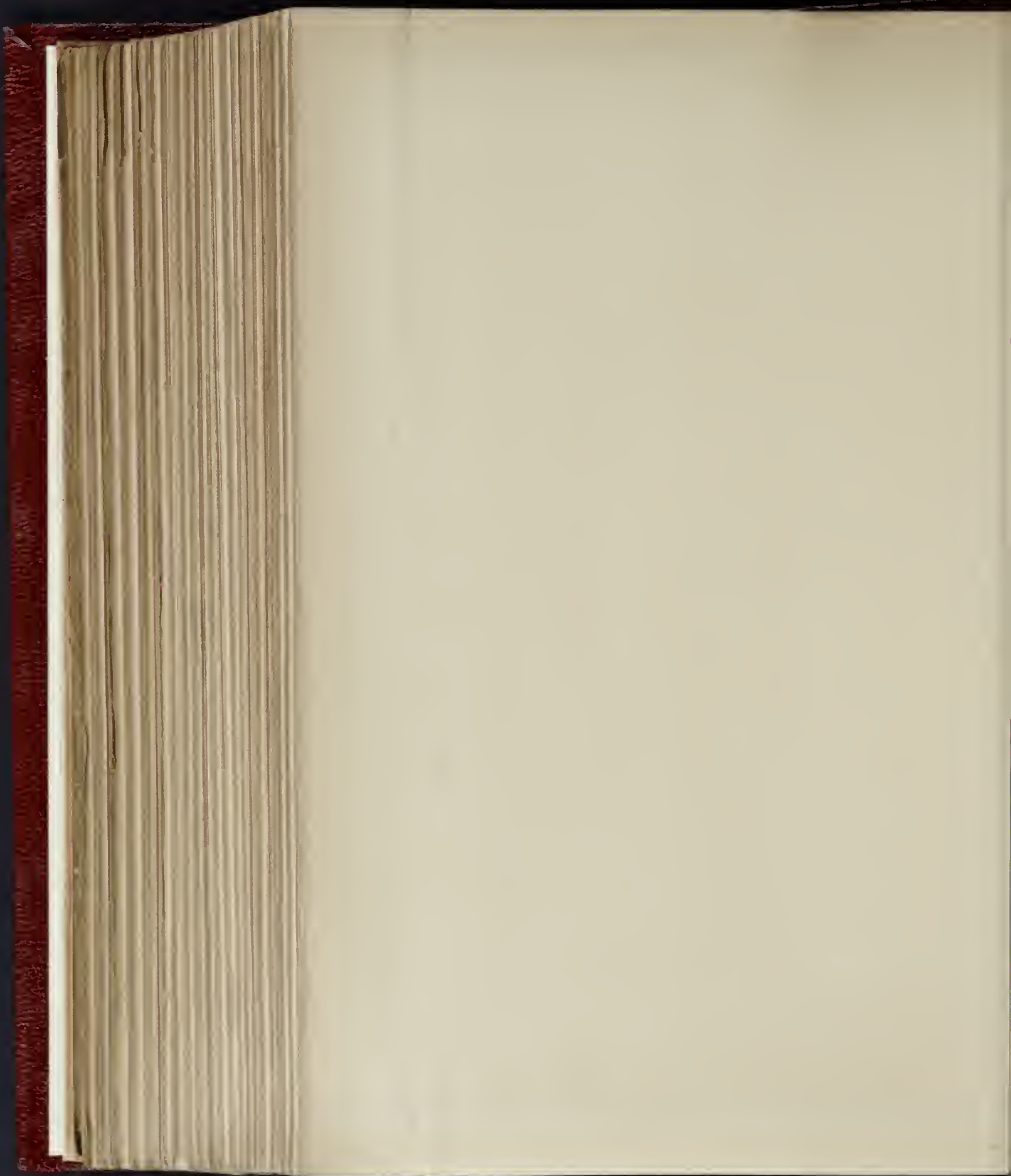
ALTAR FRONTAL, WOVEN IN RED AND GOLD BROCADE; FOR USE IN BUCKINGHAM PALACE CHAPEL.



ALTAR FRONTAL, WOVEN IN BLUE AND GOLD, FOR NORTH-WEST CHAPEL, ST. PAUL'S CATHEDRAL.



ALTAR FRONTAL, WOVEN IN WHITE AND GOLD BROCADE, FOR BUCKINGHAM PALACE CHAPEL.

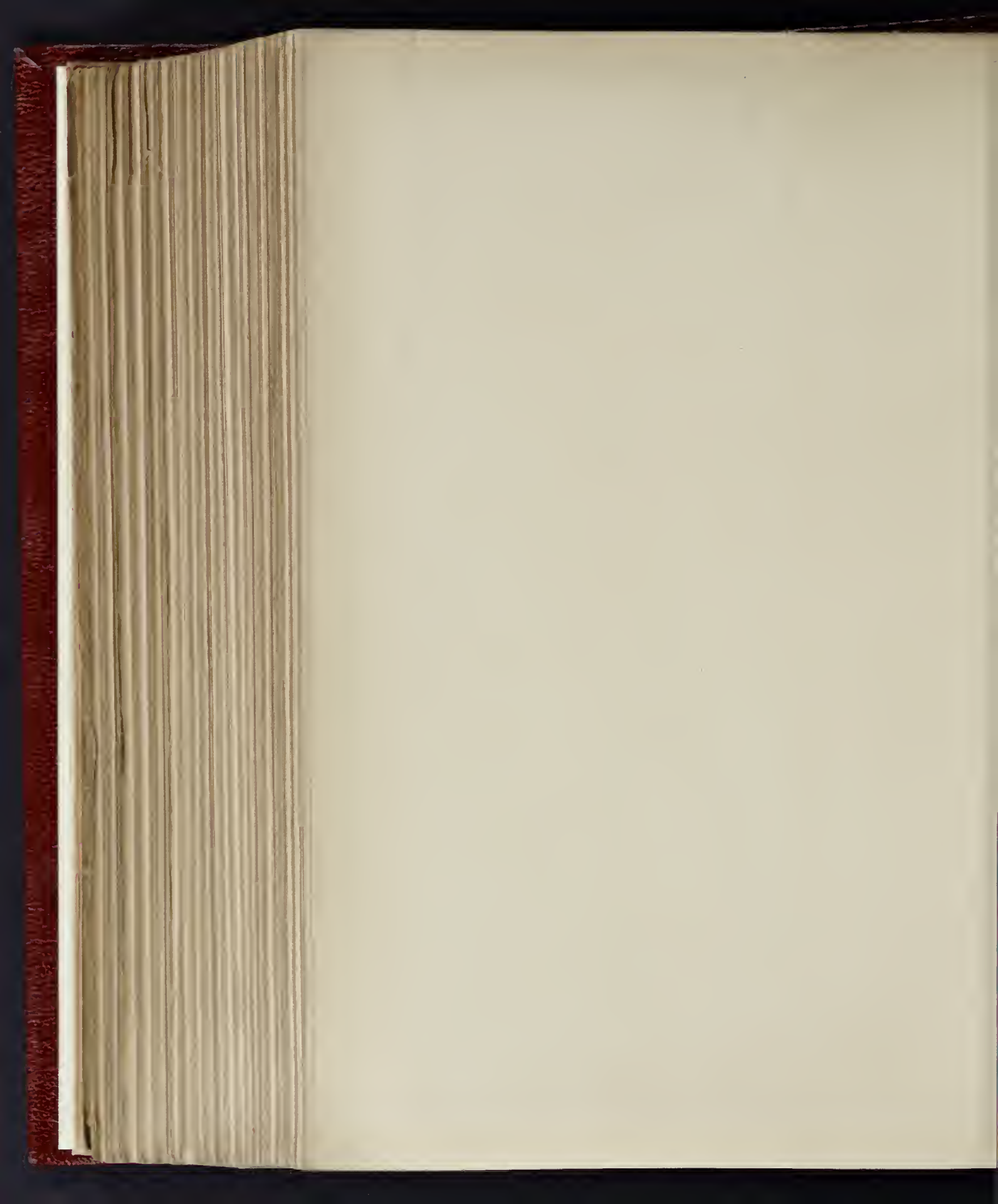




*Horace Field
11 Langham Chambers
W*

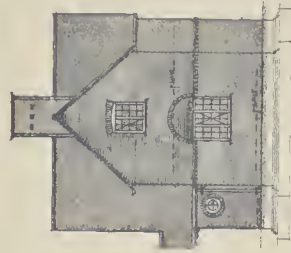
INK PHOTOGRAPHIC CO. LTD. 4 & 5, EAST HANOVER STREET, LONDON, W. 1.

PROPOSED NEW OFFICES FOR THE NORTH-EASTERN RAILWAY COMPANY, COWLEY STREET, WESTMINSTER.
MR. HORACE FIELD, F.R.I.B.A., ARCHITECT.





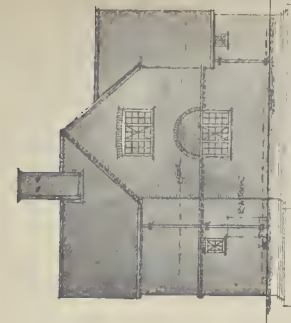
ELEVATION TO DRIVE
Main entrance has no front to yard back.



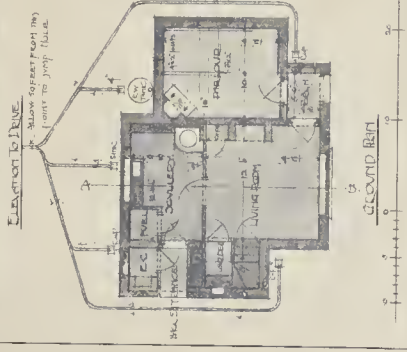
ELEVATION TO ROAD



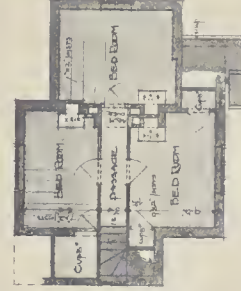
BACK ELEVATION



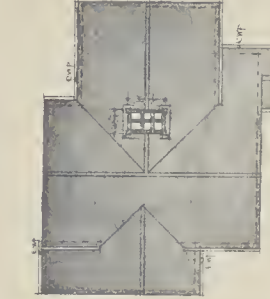
ELEVATION TO GARDEN



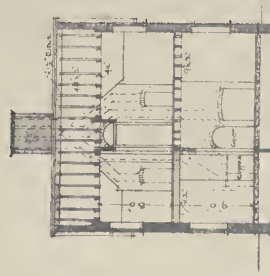
SECOND FLOOR PLAN



FIRST FLOOR PLAN



REAR ELEVATION



SECTION

PLAN OF HOUSE No. 42
J. B. BUCKINGHAM
ARCHT. FOR N. S. 20th St.

N. S. PHOTO SPRINGUE A.C. 1/4" = 4.0 S. EAST HARBING STREET FETTER LANE E.C.

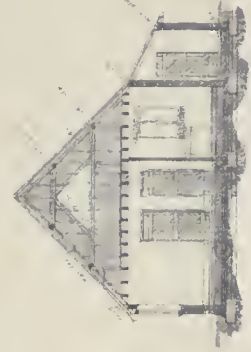
ARCHITECTURAL ASSOCIATION DISCUSSION SECTION: "ECONOMIES IN SMALL HOUSES."

THE BUILDER, NOVEMBER 19, 1904

Ceiling - Down - Cave - Exp.
Entrance - Large, - Buckinghamshire.

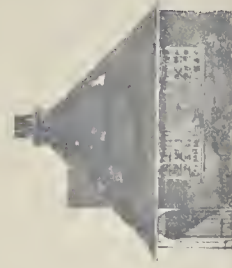


ELEVATION TO KOORI



SECTION

Figures on roof denote vertical size of eaves
Architectural section with 1/4" = 1.0 scale.



ELEVATION TO DRIVE



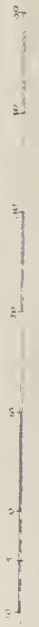
GROUND FLOOR PLAN

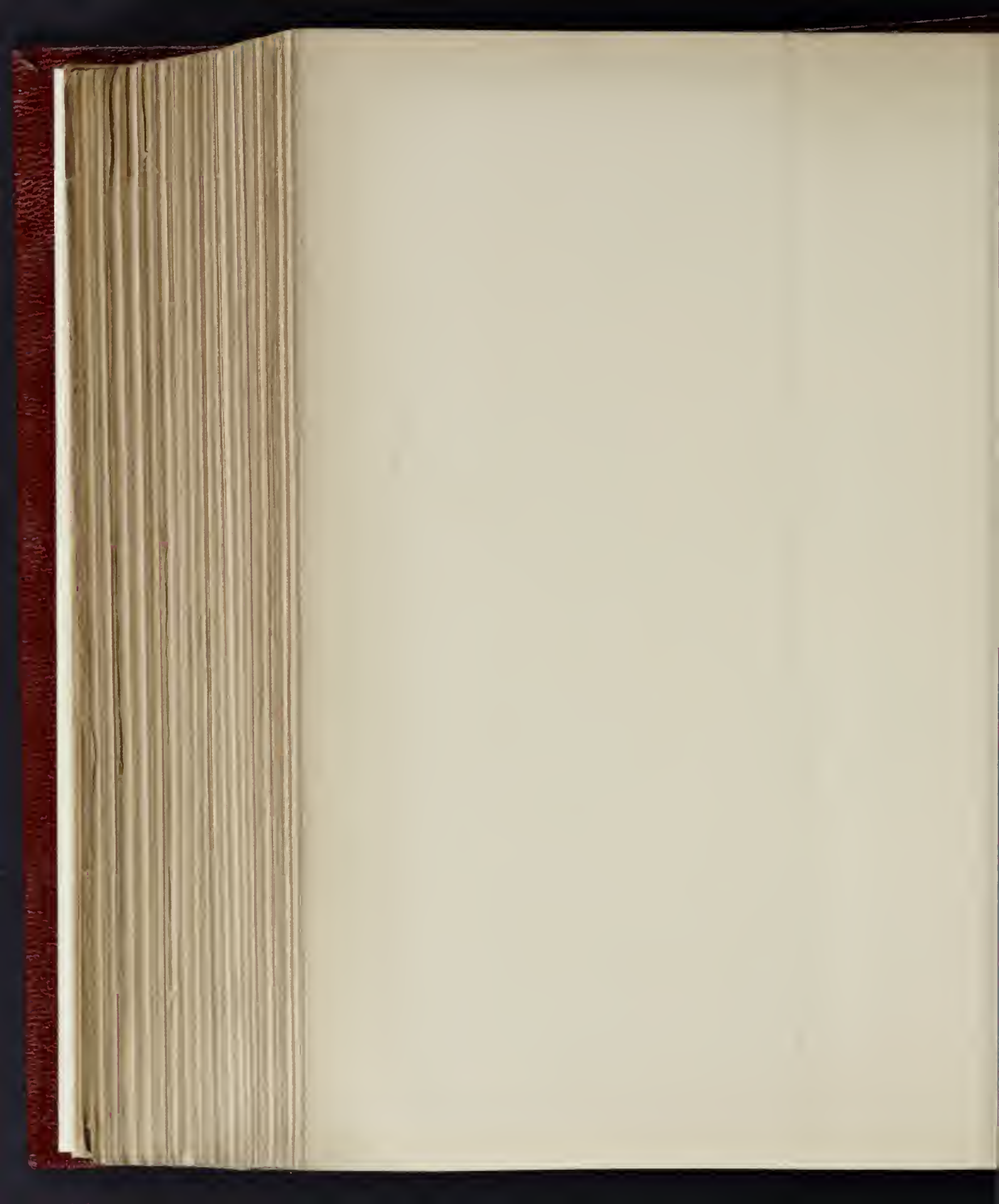


THIRD FLOOR PLAN



BACK ELEVATION





ways look back upon his tenure of the office of Hon. Secretary as one of the most pleasant experiences of his professional career, and he would always remember the very cordial relations which had existed between himself and the various Councils, and he thanked them for the kind way in which they had always listened to anything he had to say. In the early days of the Institution, when he was Secretary, porter, editor, and accountant, etc., he came in since then the Institution had found in Mr. Julian C. Rogers, their Secretary, a most able general administrator of its affairs, and he took that opportunity of thanking Mr. Rogers, whose cordial friendship had made his (the author's) tenure of office most pleasant, and also thanked the staff for their most cordial cooperation. He also thanked the members for the position they had just placed him in, and to Mr. Jacob Hood for the portrait he had intended. He had one request to make, and that was that the Council would accept the statue and would place it somewhere in that room, as a companion portrait to that of his late and valued friend John Clutton. The President said he was sure the Council would accede to Mr. Penfold's request. The Secretary announced that the next meeting would be held on Monday, November 22, when a paper would be read by Mr. C. J. Junon on "The Building Surveyor: his Training and Practice." The meeting then terminated.

Illustrations.

TAIL OF THE PRINCIPAL ENTRANCE, PISA CATHEDRAL.

It will be remembered that the Cathedral at Pisa was begun after the naval victories of the Pisans near Palermo. "The most famous artists from foreign parts vie in lending their aid to the building of such an important work, under the direction of Buschetto." The plans from Palermo, Majorca, and elsewhere are fitted into the cathedral as integral parts of the design. It is therefore not easy to distinguish between the classic work and that of the thirteenth and thirteenth centuries. There is no doubt that the founders of Gothic Sculpture were intensely influenced by the fine classical remains in the Campo Santo at Pisa. We need go no further than the South Kensington Museum to see this in the cast that is there in the architectural room of Niolo Pisano's shop. Some of the figures in this are direct descents from the antique. The pillar on the right, in our illustration, is a beautiful specimen of ancient work. The figures on the jamb, representing the origin of Christ from David, are probably the work of Gislelvi, who built the baptistry about 1150. Smaller shaft is probably an antique of neo-Byzantine workmanship, though not by many of the sculptors at work on the building were steeped in the influence of this style of ornament. The Cathedral is famous for its marble shafts, of which many are of antique.

ALTAR FRONTS.

These are examples of modern altar fronts commissioned from Mr. Edmund Hunter, of London, and designed and executed by him. We are unfortunately unable to give the full effect, which counts for so much in work of this kind; but the drawings show clearly the design and character of the designs, and the sense of beauty that them as to the main colouring enable the reader in some degree to appreciate their effect. From a note received by the artist at the last meeting, we learn that the lower design on the left, which is described as made for Buckingham Palace Chapel, has in fact just been put up by him in the private chapel at Windsor Palace.

NEW OFFICES FOR THE N.E. RAILWAY COMPANY.

The North Eastern Railway Company have been compelled to build new offices on a site in Dowley-street, Westminster, their present building in Great George-street having been requisitioned by the Government for the new Government offices. The south front of the new building, here illustrated, is to be faced with red bricks from

Messrs. Lawrence and Mr. Allen of Sudbury; light bricks for the quoins, darker bricks for the filling in, rising five courses to the foot. The stone is brown Portland.

The contractors for the work are Messrs. Holloway Bros. The architect is Mr. Horace Field, and the drawing was exhibited at the last Royal Academy exhibition.

COTTAGE, GREAT WARLEY; AND LODGE AT AMERSHAM.

These two designs, by Mr. Guy Dawber and Mr. Phillips Higgs respectively, formed two of the illustrations to the paper on "Economies in Small Houses" read before the Architectural Association Discussion Section by Mr. A. H. Belcher, and printed nearly in full in the present issue. They are referred to and described in the course of the paper.

THE METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of the Managers of the Metropolitan Asylum District was held at the offices, Victoria Embankment, on Saturday last week.

Millfield Homes.—The Works Committee reported that the total cost on completion of Millfield, Rustington, had been 24,234. The cost had been increased on account of the Managers having to provide their own water supply. The homes accommodate 100 patients. Messrs. J. Parsons & Sons were the contractors for the work.

North Eastern Hospital.—The Committee have ordered the renewal of some ceilings of this hospital at a cost of 408. 10s. The work is being done by Messrs. Higgs & Hill.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring-gardens, S.W., Mr. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Kensington Royal Borough Council 7,600. for street improvement, and Woolwich Borough Council 10,000. for baths and wash-houses. Sanction was also given to Paddington Borough Council to borrow 5,833. for contribution to reconstruction of Westbourne-park-bridge.

St. Louis Exhibition.—The General Purposes Committee reported the receipt of letters, dated October 22, 1904, from the Commissioner-General for Great Britain of the St. Louis Exhibition, stating that the International Jury have awarded to the Council a gold medal for its exhibit of the model of the shield used in the construction of Blackwall Tunnel, and that the chief engineer of the Council has been awarded a similar medal.

Selected Lists of Contractors.—On the recommendation of the Education Committee the name of Messrs. Walter Lawrence & Son, of Canal Works, Waltham Cross, was added to the selected list of contractors to be invited to tender for the erection of new schools and additions to schools; the name of Messrs. Chittenden & Simmons, of West Malling, Kent, was added to the list of contractors for paving the playgrounds of L.C.C. schools; the name of Messrs. J. Yetton & Co., of No. 4, Carr-street, Limehouse, was added to the list of contractors to be invited to tender for repairs to heating apparatus under the printed schedule of prices for heating works, and Messrs. Frank W. Harris & Co., Limited, of "Albion Works," Albion-grove, Barnsbury, were placed on the selected list of contractors to be invited to tender for carrying out structural alterations and repairs to school buildings to the value of 500l.

The London Building Act Amendment.—The following report of the Building Act Committee was brought up as a matter of urgency, and it was discussed at great length, together with the long report of the Committee on the Amendment of the Act, which we printed in *extenso* last week—

"We think it right to draw the attention of the Council to the fact that the suggested amendments to the London Building Acts which are outlined in the report of the Building Act Committee affect the work of many other committees of the Council. For instance, paragraph 7 of our recommendation deals with the provision of means of escape in case of fire and the reduction of risk of fire in buildings. The numerous fatal fires that have occurred in recent years (amongst others the fire in Alder-street on October 19, 1904, in which six lives were lost; in a restaurant in Duke's Head-passage, Ivy-lane, E.C., on February 25, 1904, seven lives lost; in Hackney-road, on October 18, 1903, three lives lost; in Brownlow-street, Holborn, on January 18, 1903, three lives lost;

in Ben Jonson-road, Stepney, on December 29, 1902, six lives lost; in Queen Victoria-street, on June 9, 1902, ten lives lost) amply demonstrate the need for urgent action with regard to the question of safety from fire, and the Fire Brigade Committee have impressed upon us the necessity of every effort being made to obtain the sanction of Parliament as early a date as possible to the proposals with regard to this matter. The suggested amendments which particularly affect the work of the Highway Committee are contained in paragraph 8 of our recommendation; those affecting the Improvements Committee in paragraph 4, and those affecting the Main Drainage and Public Control Committees in paragraphs 11 and 12 respectively. All these committees are submitting reports to the Council on Tuesday, November 15, 1904, stating that they consider that it is desirable that every effort should be made to obtain the sanction of Parliament at the earliest possible date to the suggested amendments with which they are particularly concerned. There are also very important amendments which affect the work of the Public Health Committee (paragraph 6), and also amendments suggested by the Local Government Committee (paragraph 5). These committees met too late to submit a report to the Council, but we know from the memoranda which they have sent to us that they are anxious that the sanction of Parliament should be obtained to their proposals as soon as possible. In view of the importance not only of the suggestions particularly affecting the work of the Building Act Committee but of those affecting the work of other committees of the Council, and of the urgent representations which have been made by those committees with respect to the suggested amendments affecting their work, we desire to express the hope that the Council will decide that every effort should be made to obtain in the session of 1905 the sanction of Parliament to our proposed amendments to the London Building Acts."

The following are the reports of the Fire Brigade Committee and the Highways Committee and the Public Control Committee respectively:—

"We have had under consideration the Building Acts (Amendment) Bill, 1905, so far as it relates to fire protection and means of escape in case of fire, and we observe that nearly all the suggestions which, after consultation with the late chief officer of the Fire Brigade and the present chief officer, we made to the Building Act Committee have been met in the Bill. These suggestions dealt mainly with, (a) the means of escape from buildings above a certain height, (b) fire protection and means of escape in premises used partly as shops and partly as dwelling-houses, with special provisions as to fire premises used partly as shops, (c) fire protection and means of escape in premises part of which consists of projecting shops, (d) buildings over 80 ft. in height, (e) doors between buildings, (f) the storage of timber and protection of neighbouring buildings, (g) the conversion of a dwelling-house into a factory, warehouse, etc., (h) the division of one shop into two or more shops, (i) the protection of windows and openings of buildings within 30 ft. of openings of other premises, (j) the protection of constructional ironwork, and (k) the construction of lift shafts. As a result of our consideration of the Bill we informed the Building Act Committee that we thought that the clauses with regard to projecting shops, the protection of windows and openings in buildings, and the protection of constructional ironwork should be retrospective after a certain period, and that the provisions with regard to the storage of wood and timber should be made more stringent in the case of timber yards adjoining dwelling-houses, but the Building Act Committee have not seen their way to make the necessary amendments. We are still of the opinion that we expressed in the joint report of the Building Act, Fire Brigade, and Parliamentary Committees, presented to the Council on May 26, 1903, that the need of further legislation with regard to protection against fire in and provision of means of escape from buildings is extremely urgent, and we therefore think that clauses dealing with the matters mentioned above should be proceeded with in the next session of Parliament."

"We have, at the request of the Parliamentary Committee, considered the provisions of the London Building Acts Amendment Bill, which the Council has decided to introduce in the next session of Parliament, so far as they relate to tramway buildings. In connection with tramway work, we have experienced certain difficulties from time to time, owing to the limitations contained in the London Building Act, 1894, as to the cubical extent of buildings, and sections 80 and 81 of the Bill, as now submitted to the Council, will, we are of opinion, deal satisfactorily with that point. The size and special character of buildings used for electrical tramways made it extremely important that the exemptions in those respects accorded by section 203 of the London Building Act, 1894, to buildings of certain descriptions should be extended to tramway structures. In these circumstances, we desire to express the hope that every effort will be made to secure the passing of a Bill in the next session of Parliament to secure these objects."

"The Building Act Committee have been in communication with us on the subject of the suggested amendment of section 118 of the London Building Act, 1897, which prohibits the establishment, or the carrying on, of dangerous businesses at a less distance than 40 ft. from a public way, or 50 ft. from any other building or vacant land in other ownership. Proposals which have from time to time been made to establish such businesses in the County of London have had to be abandoned owing to the difficulty of complying with that section, but it appears to us that many of the businesses might be conducted with safety under proper supervision, and subject to proper conditions imposed in licence. We have therefore suggested to the Building Act Committee the desirability of applying to Parliament for powers enabling the Council to consent, in such cases as it may think fit, to the carrying on of dangerous businesses within the county. We are of opinion that the draft clauses embodied in the Bill prepared by the Building Act Committee will give effect to our views, and we consider that every effort should be made by the Council to obtain the sanction of Parliament to the proposals at the earliest possible moment."

Upon the reception of the report. Mr. Thomas asked why the Borough Councils had had no opportunity of considering the proposals?

Mr. Stuart Sankey said he had received a letter from the City Solicitor stating that he had written to the Council to ask that the draft Bill should be sent on to the City Corporation for their consideration. Nothing, however, had been done in that direction, and therefore the City could offer no opinion.

Captain Hemphill said they had written to the Borough Councils asking for their suggestions for the amendment of the Act. There would be no difficulty in sending them a draft of the Bill.

Mr. A. M. Torrance, Mayor of Islington, said they had not had the draft Bill asked for.

Captain Hemphill, chairman of the committee, moved the adoption of the Report. He proceeded to give a history of the origin and fate of the last Bill presented in 1902-3. The committee, he said, subsequently wrote to the Corporation, to the Borough Councils, and to the building authorities, including the Royal Institute of British Architects, to ask for suggestions in regard to a proposed amending Bill. The result had been a mass of valuable information, especially from the Royal Institute of British Architects, which contained many useful suggestions. They eventually sent 245 suggestions to the Parliamentary Committee for embodiment in the Bill. Having sent these proposals to the committee, they—the Building Act Committee—proceeded with their proposals. The draft Bill was now in existence. It was not one for restrictions only, but granted concessions. It proposed for one thing to allow buildings of larger cubical space to be erected in London; and enabled the Council to approve buildings constructed of iron and steel and concrete. They also proposed to allow local authorities to supervise and control buildings under a certain size, and they dealt effectively, he thought, with the question of fire-resisting materials. They only asked the Council to approve definite principles. He did not suggest that the Council should be bound that day to every detail in the measure. They only wanted an assent to the general policy. The draft Bill must be deposited on December 17, and between that date and the middle of February there would be plenty of time for the local authorities to discuss the details of the Bill, which could be settled definitely by the Council itself before the end of January. The Council would then have ample opportunity for discussing the amendments and suggestions made by the local authorities. He thought it would be a great pity if the Bill was not approved that day, considering the time spent on preparing the measure, and especially the fact that they had dealt very carefully with the suggestions which had reached them from outside.

Dr. Napier moved the following amendment:—

"That, whilst fully recognising the necessity of amending, at an early date, the London Building Acts in many important particulars, the Council is of opinion that, having regard to the number and magnitude of the proposed amendments, to the fact that they have not been submitted to and considered by the professional bodies and local authorities in accordance with the practice hitherto adopted, and which the Building Act Committee in their report to the Council on June 14, 1904 (p. 989), implied would be followed, and to the further fact that the proposals of the Council for legislation in the next Session of Parliament are already both numerous and important, it is undesirable to proceed with the proposed amendment of the London Building Acts in the next session of Parliament; but that such proposals be referred back to the Building Act Committee for further consideration, with a view to legislation being sought in the session of 1906."

He said he hoped that the Council would not be misled by a suggestion that in giving the Parliamentary notices they were not committing themselves to the principal details of the Bill. The Act of 1894 when introduced consisted of 192 sections. It was really a consolidation of old Acts. The Bill of 1904 was not of that character; but introduced new laws and new proposals, which raised considerable opposition. The Bill of 1894 took twenty-two days before the Commissioners of Parliament, and he ventured to think that this Bill would take double that time. The Bill now before them needed at least five months' examination by the local authorities. The Building Act Committee had not given one-thirtieth part of the time they should have done to the consideration of the Bill. Finally, the local and professional bodies had not been properly consulted. They were asked in effect: How would you amend the Building Law? Now that was not what they wanted. They wanted the Bill in order to consider the actual proposals to be made. The surveyors and architects of London knew more about the Building Law of London than any member

of the Building Act Committee. They would have, without the Building Bill, eight highly contentious measures. If they carried the Committee's Report, and if the Parliamentary Committee were compelled to go on with the Bill, some of the measures he had mentioned would suffer. He believed that they could not get the Bill through the next session.

Mr. Shephard, in seconding the amendment, said it was impossible for anyone who did not devote days to studying the Bill to understand what it meant. It was a Bill of 179 sections, and, he ventured to say, would raise up in opposition all vested and individual interests, creating a hostility against which it would be useless to fight. The Bill proposed that the Building Act should apply to Government property. Did they think they could get that clause passed? Then the Bill attacked the magistrates. They proposed to ignore the duties of magistrates in respect to dangerous buildings and new streets. They were going to attack the rating authority. They were "going for" the district surveyors, proposing to pay those officials by salary instead of by fees. They were to be the servants of the Council, instead of independent officials. Summonses which were issued by the district surveyors were to be issued by the Council, and, as these summonses averaged 1,000 a week, they would need a bigger staff. They were asking Parliament to abrogate its functions by making streets wherever they liked. In effect, they proposed to pull down houses just where they liked. Then they attacked the Tribunal of Appeal—one of the safeguards of the Act. They proposed that no practising architect or surveyor should sit on the Tribunal of Appeal. They were dealing for the first time with churches and chapels by insisting upon bolts and swing doors. Not content with taking people's property, they were going to alter the Lands Clauses Act. The 10 per cent. for compulsory purchase was deleted, and they wanted foreclosures to be dedicated to the public. In old streets it had been held by law that if an owner erected a low house he could re-erect the house to the same height as his neighbours'. The Bill was drastic and offensive, and it was absurd to ask them at one sitting to pass a measure of this character. Let them use this time between now and a year hence in getting all public opinion together, so that they might be able to present a Bill which would have the deliberate opinion of London behind it.

Mr. John Burns, M.P., said that in the interests of the public they should go on with the measure. Passing on to discuss the question of narrow courts, Mr. Burns said that Angel-court in the City was not more than 6 ft. 6 in. wide. They suggested that as an escape could not get up such courts, the people should have a trap-door, so that they might escape. House-owners in the City did not mind the expense. As to District Surveyors, a man spent the other day 18. 3d. in putting in a bit of cement in a crack in the steps of his front-door, and the surveyor's charge was 19s. 3d., and there were other similar cases.

Mr. Alderman Alliston said it was not a question of this Bill or no Bill. They were agreed that there should be a Bill. They were also anxious that precautions should be taken against the risk of life by fire. The Bill, however, which was of a very drastic character had not been considered by the local authorities. They had heard a good deal of the protection of buildings, but nothing about the people. Who was to pay for carrying out this Bill, which would improve London off the face of the earth? If it were passed it would mean the reconstruction of London within the next seven years. How could a business man live if that was the case? Lawyers, architects, and surveyors would reap a fortune. He did not think that sufficient consideration had been given to the proposals, which would adversely affect the leaseholder and tenant, however much expense the owner might be called upon to bear.

Colonel Rotton said he could very well remember the inquiry as to the Cripple-gate fire. Then, as the chairman of the Fire Brigade Committee, he was looked upon by the City representatives and officials as one who was more or less responsible for the fire. Bearing in mind the remarks of the City members when fires occurred, he would be no party to shielding City merchants when there was a question of saving life.

Mr. Howell J. Williams complained that the Council had not sent the draft Bill to the authorities for their consideration. Architects and builders were not opposed to an amendment of the Building Act. They would welcome an amendment, but it necessary, before such a despotic power given into the hands of the Building Act Committee, that they should have the full force of public criticism. At present they were proposing to raise a hostility for which there was no necessity.

Mr. R. C. Phillimore said that the deputy chairman had told the Council that it ought to consult the business man in the City. That was quite right, so far as it went, for there was already too much power in the hands of the professional bodies.

Mr. E. Smith (Chairman of the Fire Brigade Committee) remarked that some of the proposals put forward by his Committee were far more drastic than those which the Building Act Committee recommended. They put life and wealth, and were determined to go on with the thing.

Mr. E. White said that while having no doubt to look after the interests of the moneyed class, he felt that to go on with the Bill now was to ensure certain defeat. The Bill ought to be sent to the various local authorities and the Institute of Architects and the Surveyors' Institute, and if this was done a great many of the present difficulties could be got over.

Mr. H. R. Taylor said that two years ago when a small Bill was brought before the Council, they were asked to withdraw in favour of a complete Bill. Now these members said that the Bill was too big.

Mr. Jephson said the Bill was not merely a fire-prevention measure, but one designed to improve the public health. He appealed to the Council to push it forward.

On a show of hands the amendment had 25 supporters and 62 opponents.

A division was then demanded, when it was voted: For the amendment, 27; against amendment, 75.

The Council afterwards approved the recommendations.

A New Fire Station.—The Fire Brigade Committee presented a report recommending the Council to take steps for the erection of a new fire station in place of the present Water Road Station, at an estimated cost of between 24,700*l.* and 26,000*l.* The recommendation was agreed to.

Tramways.—The Highways Committee recommended that the Standing Orders be suspended in order that application may be made to Parliament next Session for powers to construct tramways over Blackfriars and Water Bridges and along the Victoria-embankment.

Mr. Sankey hoped the Committee would consider the proposal. He had no mandate to speak on behalf of the City Corporation, he knew the question was being considered by a Committee of that body.

Mr. Wightman felt that it would be better to stop the Lord Mayor's Show or a procession occasionally by having the tramway rather than have the daily procession of people walking over the bridges from South of London.

Mr. Alliston supported the proposal, as he considered it an absolutely necessary tramway. At the same time, an assurance ought to be given to the City Corporation that this was to be a street in itself, and was not to be made a set-back stone for tramways through the narrow streets of the City.

The recommendation was agreed to.

The Preservation of Garden Squares.—The Parliamentary Committee submitted a dealing with the preservation of garden squares and enclosures, and recommended:—Parliamentary authority be sought in the Session of 1905 to secure that the garden square enclosures in London shall be permanently preserved as such, and that such garden squares and enclosures when so preserved shall be free from any future legislation relating to taxation of ground or site values."

Mr. H. P. Harris said he thought the Council was entitled to more information on the matter, more particularly as to what squares were scheduled in the Bill.

Dr. Napier replied that the owners of half the squares in London were friends of the Council, as was the Chancellor of the Exchequer as the head of the Woods and Forests Department.

The recommendation was carried.

Long-grove Asylum—Erection of superstructure.—The Asylums Committee reported as follows:—

In pursuance of the promise of our chairman to submit to the Council further information as to the estimate for the erection of the superstructure of the Long-grove Asylum, we now report as follows:—
 The amount of the accepted tender (that of Messrs. Foster & Dicksee) is £359,892 10 0 the architect's cube estimate was £338,000 0 0
 which must be added for "foundations" of some of the detached buildings omitted from the foundation contract and included in the superstructure contract 10,000 0 0
 leaving the amount of the tender in excess of the architect's cube estimate to be £349,892 10 0
 The estimate of the quantity surveyors (based on priced bills) obtained at the request of the Finance Committee amounts to £389,119 17 3
 deduct amount of accepted tender £359,892 19 0
 leaving the excess of the quantity surveyors' estimate over the accepted tender to be £29,227 1 3

In the event of the Committee having contemplated the execution of the work by the Works department, in accordance with the standing orders of the Council, they would have had to obtain an estimate from the proper officer, and, before reporting to the Council, to refer to the Finance Committee the estimate and the specifications, to the Works Committee for consideration. The estimate, therefore, that would have been submitted to the Works Committee is that prepared by the quantity surveyors referred to above. As shown in the tender accepted by the Council, viz., that of Messrs. Foster & Dicksee, amounted to £359,892 10s., is £277 7s. 3d. less than the quantity surveyors' estimate.

Housing.—The Housing of the Working Classes Committee reported that all the tenements in Barnaby-buildings, Leroy-street, Bromley-road, are practically completed. The dwellings have been provided for the purpose of rehousing 291 persons of the working class who will be displaced by the carrying out of the Long-lane and Tabard-street improvements, and the two blocks together contain accommodation for 400 persons in 40 tenements of two rooms, and 40 tenements of three rooms each. The Council, adjourned shortly before eight o'clock.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.
Kensington, South.—A deviation from the an approved on April 26, 1904, for the erection of an electrical transformer station on the site of Nos. 1 and 3, Pelham-street, and Nos. 1 and 2, Thurloe-houses, Thurloe-square, Kensington, so far as relates to an alteration the frontage line in Pelham-street (Mr. W. G. Green for the Metropolitan District Railway Company).—Agreed.
Lewisham.—Three houses, with one-story shops in front, on the site of No. 63, Dartmouth-road, Forest Hill, and the erection of additional stories over the existing shops on Nos. 55 and 55a, Dartmouth-road (Mr. E. C. Christmas).—Consent.
St. George, Hanover-square.—That the application of Mr. T. Worlock for an extension of the period within which the erection of two iron and glass shelters at the St. George's station workhouse to abut upon Wallis-yard, Buckingham Palace-road, St. George, Hanover-square, was required to be commenced, and granted.—Consent.
Brixton.—That the application of Mr. A. Burne for an extension of the period within which the erection of a three-story addition to the Stockwell Training College on the north-west side of Stockwell-road, Brixton, was required to be commenced and completed, be granted.—Consent.
Finchley, Central.—Two projecting porches a proposed factory on the site of Nos. 61 to 63 (odd numbers) inclusive, Collier-street, Penville (Mr. S. D. T. Pettit for Messrs. Verrett & Co.).—Consent.
Fulham.—Projecting porches with balconies over and barge boards at Nos. 41 to 79 (odd numbers), Finlay-street, Fulham (Mr. A. Dawkins for Mr. R. B. Mason).—Consent.
Hackney, South.—The retention of a wooden and glass porch at the workhouse, Honey-road, Homerton (Mr. F. R. Coles for

the Guardians of the Hackney Union).—Consent.
Marylebone, East.—A house with projecting porch and bay windows on a site abutting upon the southern side of St. Edmund's-terrace and eastern side of Avenue-road, St. Marylebone (Mr. A. F. Faulkner for Mr. W. Willett).—Consent.
Poplar.—Projecting porches at the Primitive Methodist Chapel, Manchester-road, Cubitt Town (Mr. H. Harper).—Consent.
Wandsworth.—Retention of four houses on the east side of Burstock-road, Putney, northward of No. 21 (Mr. T. G. Rutherford).—Consent.
Wandsworth.—One-story shops in front of Nos. 93, 100, and 102, Lower Richmond-road, Putney (Mr. J. Durham for Mr. A. Welham).—Consent.
Westminster.—A projecting porch, steps, and angle turret at Hopkinson House, Vauxhall Bridge-road, Westminster (Mr. R. S. Ayling for the Brabazon House Company).—Consent.
Lewisham.—That the application of Mr. A. H. Kersey for an extension of the periods within which the erection of houses with bay windows on the west side of Brockley-rise, Lewisham, was required to be commenced and completed, be granted.—Consent.
Dulwich.—Two two-story bay-windows at No. 73, Camberwell-grove, Dulwich (Mr. F. Banister for Mr. H. W. Haile).—Refused.
Hackney, South.—That the Council do not accede to the request of Messrs. W. Silk & Son for permission to retain a showcase on the forecourt of No. 20, Urswick-road, Homerton).—Refused.
Hampstead.—An iron and glass covered way at No. 14, Buckland-crescent, Hampstead (Mr. J. P. Hamilton).—Refused.
Stepney.—A projecting hood over the entrance to "Court House," Holloway-street, Commercial-road, Stepney (Messrs. Joseph & Smith for the Council of the United Synagogue).—Refused.
Width of Way.
City of London.—Re-erection of buildings on the western side of Cross Key-court, London-wall, City (Mr. A. Griffin for Mr. G. J. Mathieson).—Consent.
Hampstead.—Additions to "The Whims," North End-road, Hampstead, with a boundary fence at less than the prescribed distance from the centre of the roadway of the street (Messrs. Grayson & Ould for Mr. W. H. Lever).—Consent.
Holborn.—Working-class dwellings on a site abutting upon the south side of Summers-street and west side of Back-hill, Holborn (Mr. A. T. Quartermain for Mr. A. J. Best).—Refused.
Width of Way and Line of Frontage.
Marylebone, West.—A scullery and entrance hall addition, projecting steps, and hood in front of No. 22, Hill-road, St. John's Wood (Mr. S. A. Tatchell for Mr. E. A. Benjamin).—Consent.
Width of Way and Space at Rear.
Southwark, West.—A two-story building upon the site of No. 103, Broadwall, to abut also upon Rouppell-street (Messrs. J. Hoare & Son for Mrs. A. Hoare).—Consent.
Space at Rear.
Battersea.—A modification of the provisions of section 41 of the Act, so far as relates to the proposed erection of club rooms on a portion of the open space about "The Cedars" clergy house, High-street, Battersea, to abut upon Orville-road (Mr. J. S. Quilter for Canon J. Erskine Clarke).—Consent.
Southwark, West.—A modification of the provisions of section 41 of the Act, so far as relates to the proposed erection of a cart-shed with four stories over, on the east side of Gravel-lane, Southwark, to extend over part of the open space at the rear of a stable building on the north side of Orange-street (Mr. E. Carritt for Mr. J. Sainsbury).—Consent.
Paddington, South.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building at No. 32, Westbourne-grove, Paddington (Mr. A. Young for Mr. J. Rossdale).—Refused. (That the applicant and the District Surveyor be informed that if it be proposed to unite Nos. 30 and 32, Westbourne-grove, it will be necessary to bring the united building into conformity with the provisions of section 74 (2) of the Act.)
Deviation from Certified Plans and Projections.
Chelsea.—The construction of an additional story and a projecting angle turret to the Cadogan Hotel, Sloane-street, Chelsea (Messrs. Brown & Barrow for Mr. T. Lassam).—Refused.

Formation of Streets.
Clapham.—That an order be issued to Mr. J. Donkin sanctioning the formation or laying out of a new street for carriage traffic to lead from Kendoo-road to High-street, Clapham (the late T. G. Foster).—Consent.
Wandsworth.—Permission to retain barriers across Ellerton-road, Burntwood-lane, Wandsworth (Messrs. Holloway Brothers).—Consent.
Buildings for the Supply of Electricity.
Woolwich.—Floors of an addition to the engine-room at the electric-light station, Globe-lane, Woolwich (Mr. F. Sumner for the Council of the Metropolitan Borough of Woolwich).—Consent.
Height of Buildings and Means of Escape at Top of High Buildings.
Kensington, South.—A building on the north side of High-street, Kensington, at the corner of Brown's-buildings (Mr. P. E. Pilditch).—Consent.
Deviation from Certified Plans.
Whitechapel.—Deviations from the plan certified by the District Surveyor, so far as relates to the proposed erection of buildings upon the site of Nos. 2, 4, and 6, Old Montague-street, and a portion of the site of "The Archers" public-house, Osborn-street, Whitechapel (Messrs. Turner & Holditch for Mr. A. G. Turner).—Consent.
Widening of Streets, Width of Way, and Line of Frontage.
St. Pancras, North.—A building upon the site of Nos. 9, 11, 13, 15, and 17, Highgate-road, St. Pancras, to abut also upon Greenwood-place, and in connexion with such building the widening of a portion of Greenwood-place (Mr. G. H. Greatback for Mr. W. A. Currock).—Refused.
Working-class Dwellings.
Limehouse.—Dwelling-houses to be inhabited by persons of the working class on a site to the northward of the Rotherhithe-tunnel approach, between Rose-lane and Butcher's-row (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.
 The recommendations marked + are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.
SHEFFIELD SOCIETY OF ARCHITECTS.—The ordinary monthly meeting of the Sheffield Society of Architects and Surveyors was held on the 10th inst. in the Lecture Hall of the Literary and Philosophical Society, Leopold-street, Mr. T. Winder presiding. A ballot was taken, and the following gentlemen were elected Associates of the Society: Messrs. S. S. Smith and G. H. Rawcliffe. A lecture was then delivered by Dr. John Stokes on "Monumental Brasses." In the course of his remarks he said that monumental brasses made their appearance in England in the XIIIth century, the earliest now in existence being that of Sir John d'Abernon, of Stoke d'Abernon, Surrey, dated 1277; earlier ones now lost are recorded. This form of memorial probably first arose in Germany, and seemed to have sprung into existence as a perfect art, for the earliest examples were best in execution and design. The material of which they were made was known as "latten," a term loosely used to designate any compound of copper, and also as "Cullen plate," a corruption of Cologne, where, together with Flanders, the plates were chiefly made. Many brasses in England were of continental origin, but most were of native workmanship. The brass being a substitute for a stone effigy, the figures were represented as if lying on the back, the head resting on a cushion or helmet, and the feet on a lion or dog, as in the stone monuments; but in the XVIIth century the practice arose of showing figures kneeling and in other awkward positions—an attempt at realism, but an evidence of decay in art which was not found at the best period. Enamel was used in some brasses, but this, not being a durable material, or perhaps the method of its application not being sufficiently understood, had in most cases worn off. There was an example of the use of enamel locally in some brasses in Hathersage Church. These monuments, he said, might be divided into four classes—military, ecclesiastical, civil, and miscellaneous. It was impossible to overrate the importance and value of monumental brasses, forming, as they did, a series of illustrations of and a commentary on the history, dress, manners, and customs of our ancestors. In them they could trace the change from mail to plate armour, and its gradual disuse as a means of defence, the changes in civilian

costume showing the rise of a new order, but perhaps the clerical ones were especially noteworthy, as it was the rule of the church to bury ecclesiastics in full dress with all the ornaments of their orders, which were hence faithfully represented on the brass.—On the motion of Mr. J. Hale, seconded by Mr. C. F. Innocent, and supported by Messrs. J. R. Wigfill, H. L. Paterson, W. C. Penton, and T. S. Brown, a hearty vote of thanks was accorded to the lecturer. The lecture was illustrated by rubbings taken by Dr. Stokes.

LIVERPOOL ARCHITECTURAL SOCIETY.—On the 7th inst., in the Society's rooms, Harrington-street (Mr. P. C. Thicknesse presiding), Mr. Robert P. Oglesby gave a lecture before the Liverpool Architectural Society on "Sir John Vanbrugh, Dramatist and Architect." Mr. Oglesby said that as a playwright Vanbrugh was subject to considerable railway by Swift, Pope, and other contemporaries, but still more so when, apparently without any education in that direction, he began to practice as an architect, and under the affluence of Court favour quickly attained to great success, even ousting Sir Christopher Wren from connection with the great Blenheim Memorial undertaking. By the aid of limelight views Mr. Oglesby was enabled to point out the main features of Vanbrugh's architectural style, distinguishing what approved itself to him as commendable in contrast with the many eccentricities and extravagances of Vanbrugh, who subordinated utility to scenic effect.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The opening meeting of the new session of Edinburgh Architectural Association was held on the 9th inst., in the Association's rooms, 117, George-street, Mr. Harold Tarbolton, F.R.I.B.A., President of the Association, in the chair. In his opening address, which was on the subject of "Education and Architecture," Mr. Tarbolton said the two schools in Edinburgh which included the teaching of architectural subjects—the Heriot-Watt and the School of Art (better known as the School of Applied Art)—both fell very far short of meeting the real requirements of a school of architecture. The scope of the work was not sufficiently extensive. The standard and results of the Applied Art School were excellent so far as they went, and, being under the direct control of architects, the school supplied in a limited way the needs of those who used it as a supplement to their office work. In the teaching schools in London, Birmingham, Liverpool, Manchester, and Glasgow, the requirements for the examination of the Royal Institute of British Architects were kept in view, and a systematic course of instruction in architectural history and detail and general professional practice provided. In Edinburgh no attempt was made to prepare students for this examination. A chair or lectureship of technical science was urgently required, which would pave the way to organised teaching schools. The University authorities said that funds were not available for the endowment of a chair. In America patriotic citizens had met the occasion, and surely there were those in this country who would in a like manner come forward in the interests of an object that so much touched the welfare of the country. The course of instruction would need to embrace the special subjects demanded from architectural students for the passing of the R.I.B.A. examination, as well as such subjects of general education as were required for degrees in science, including modern languages, and the course would be useless unless it extended for at least three academic years.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The twenty-ninth report of the Leeds and Yorkshire Architectural Society, for the period from November 1903 to May 1904, shows that up to the latter date the total membership was 155; namely, thirty-five honorary members, sixty-seven members, and fifty-three associates, as against a membership of 152 at the date of the last report, showing a slight increase. A silver badge of office, to be worn by the President of the Society, has been purchased. The badge has been executed by the Bromsgrove Guild of Applied Arts, and has been subscribed for by members of council and of the Society. The Society's library has now been deposited with the reference department of the Leeds City Library authorities, where the books will be more strictly supervised. Any member or associate can borrow books on the production of his certificate of membership.

NORTHERN ARCHITECTURAL ASSOCIATION.—The council (with the approval of Mr. Glover)

have decided to purchase No. 6, Higham-place, Newcastle-on-Tyne, as permanent premises for the Association. In addition to the 500l. of Consols, already given by their past President, Mr. Glover, about 700l. or 800l. will be required to complete the purchase and make the necessary repairs and alterations. Those who wish to subscribe are requested to send their donations to the hon. treasurer, Mr. R. Burns Dick, 24, Grainger-street West, Newcastle. A list of the amounts received will be acknowledged in a circular. It is hoped (subject to the consent of the council) to further arrange with Mr. Stanley A. Smith, P.A.S.I., for a course of six lectures to members of the Students' Sketching Club, on "Quantities."

ENGINEERING SOCIETIES.

THE SOCIETY OF ENGINEERS.—A *conversazione* in connexion with the jubilee celebration of the Society of Engineers was held on Wednesday at the Royal United Service Institution, Whitehall, which was used for the first time for such a purpose. Founded in 1854, the Society was first known as the "Putney Club," owing to the fact that it had its inception among the students of Putney College, an institution then existing for the education of engineers. Meetings were held periodically at the offices of Mr. R. M. Christie and Mr. H. P. Stephenson, who, with Mr. Alfred Williams, were chiefly instrumental in bringing the new body into being. In 1857 the Society received the title it has since borne, and twelve months later the authors of papers were for the first time encouraged by the award of premiums for their most noteworthy contributions. To provide for the augmented membership that followed, the lower chamber of Exeter Hall was engaged for the meetings, and the usefulness of the organisation was further recognised in 1863, when the members began to pay visits to works possessing special interest to engineers. The Society has steadily advanced in strength, and on the occasion of the present jubilee numbers nearly 600 members. Mr. Perry F. Nurey, the present secretary, and an ex-president, was first associated with it in 1858, and, in a retrospect of the work done, he has mentioned the fact that forty-four volumes of its transactions have been published, embodying 371 papers and filling over 10,000 pages. The guests of the Society on Wednesday who assembled at the invitation of Mr. D. B. Butler, the President, and the members of the Council included Alexander Siemens, Dr. Kennedy, Dr. Francis Elgar, Sir Leader Williams, Sir A. Noble, Sir J. Thorneycroft, and the Presidents of the Surveyors' Institution, Institution of Mining and Metallurgy, Junior Institution of Engineers, Royal Institute of British Architects, the Civil and Mechanical Engineers, and the Chairman of the Society of Arts. The museum of the Institution was thrown open to visitors.

Correspondence.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

SIR,—In the report of the last meeting of the Architectural Association Discussion Section in the current number of the *Builder* (page 495), many of the remarks attributed to me are quite different from, and in one case contrary to, what I actually said, and I shall be much obliged if you will kindly insert a correction in this week's number. I said I thought that 9-in. thick external walls would not keep out the wet, cold, and heat unless covered with cement, rough-cast, or weather tiles, or something of that nature. Also that I had found straw thatch required renewing in a few years, but that reed thatch lasted a great deal longer. My experience was that there was practically no difference in cost between casement windows and double-hung sashes.

LOUIS AMBLER.
[* * * We are not responsible for the errors Mr. Ambler complains of; the reports of the Discussion Section meetings (unless in exceptional cases) are kindly furnished to us by members of the Section, and are not by our own reporter.—Ed.]

BOOKS RECEIVED.

HISPANO-MOORESQUE WARE OF THE XVTH CENTURY. By A. Van de Put. (Chapman & Hall. 12s. 6d.)

THE CATHEDRAL CHURCH OF ST. ASAPH. By Pearce B. Ironside Bax. (Geo. Bell & Sons.)

COMPETITIONS.

LIBRARY, BENWELL.—In a competition designs for a public library for the Ben District Council, that by Mr. Vernon Hodgkin, Grand-parade, Teddington, has been placed first, and the premium of 75l. awarded.

ISLINGTON PUBLIC LIBRARIES.—The special committee appointed by Islington Borough Council to carry out the arrangements in respect to the proposed new public libraries reported on Wednesday that they had approached the President of the Royal Institute of British Architects (Mr. J. Belcher) with a view to obtaining his services. He had agreed to act as assessor and adviser to the committee in respect to the designs for the central and branch libraries.

OBITUARY.

MR. NORTON.—We regret to announce death, on November 10, at Bourne-mouth, his eighty-second year, of Mr. John Norton, formerly of No. 13, Bedford Row, London. Mr. Norton was elected an Associate (as a member) of the Royal Institute of British Architects in 1850, and a Fellow in 1857, served for a while as a member of the council. Amongst Mr. Norton's more important architectural works we may cite: Church, Great North-road, Finchley, for 670 sittings, and illustrated in the *Builder* of February 19, 1870; the station, thirteen years ago, of parish church, Newport, Shropshire; church of St. Helena, Lundy Island, in 1881; Stoke Bishop Church, near Bristol, in 1886, which he added the tower and spire in the "Infants' Home" at Limsfield, for Church Missionary Society; St. Matthew Church, Brighton; Christ Church andmanuel Church, Clifton; other churches: Bedminster, Builth, Ebbw Vale, New (Salop), etc.; Training College and School for the Diocese of Gloucester and Bristol; Royal Normal College for the Blind, Wood; Evedon Hall, Suffolk, for the Maharajah Duleep Singh; "Tyntesfield," Somerset; Ferry Hall; public works and buildings for the new Boulevard, Florence; walled garden, Tynemouth; the Turf Club, Bally; South-Western Terminus, H. Southampton; Horstead Hall, Norfolk; Fillingham Hall, Norfolk; Brant Knoll, Somerset; several county courts and residential, and hotels, etc. He leaves, besides his wife, eight daughters and two sons, the youngest of whom, Mr. C. Harrold Norton, is carrying on the practice. Mr. Norton was President of the Architectural Association for the Session of 1858-9; and at the funeral, which took place at Bourne-mouth on Monday, the Association was represented by their Secretary, Mr. Driver.

MR. SAMES.—We have also to announce death of Mr. W. H. F. Sames, aged 47 years. Mr. Sames practised as an architect in partnership with his brother, Mr. G. Sames, under the style of "Sames & Green" at No. 65, Northgate, Blackburn, and 2, Knott-street, Darwen, Lancashire. Mr. Sames & Green made the plans and designs for the new buildings, and for the extension of the then existing buildings, of the Royal Cross School at Preston, together with a school sanatorium; the Sunday school, Lower Darwen, for the United Methodist Church; the Conservative clubhouse, Guide, Lancashire; and the Central Stores, the Green, at Darwen. Four years ago they were one of the six architects who were invited to take part in the competition for the erection of the Blackburn Police Courts, with a station, firemen's cottages, etc. We mentioned upon their submitted designs in our article upon the competition in our number of December 22, 1902.

MR. BOYCE.—We regret to have to record the death of Mr. Thomas Boyce, of 18, Hart-street, Bloomsbury, the known contractor, who died on Friday, 4th inst., after a very short illness, at the comparatively early age of fifty-seven. Mr. Boyce had carried on a very large business for thirty years, having started at the age of twenty-five years, and had been entrusted with numerous important works. Among the works he carried out were the following:—Alterations at Sandringham, for the late (then Prince of Wales); mansion in Bayswater Park, for the Duke of Connaught; "Saint Bruno," Sunningdale, for the Duke of Gleichen; Oakleigh Court, for Lord Gerald; mansion, Newmarket, for Marquis Huntingdon; Constitutional Club, Northberland-avenue; Maxim Nordenfelm Villa, Erith. Numerous blocks of flats—Artisan mansions, Victoria-street; St. Mary's mansions, Paddington; Brook-street-mansions,

anover-square, W.; No. 9, Cavendish-square. Various hotels—Badminton Club, Piccadilly; Naval and Military Club Chambers, Piccadilly; Burlington Club; The Metal Exchange, E.C.; numerous churches, schools, private houses, etc. Mr. Boyce, in addition to being a contractor, was also one of the largest owners in London, and was chairman and director of several property companies.

Mr. STANFORD—Mr. Edward Stanford, Geographer to the Queen, died at his residence in Sidmouth a few days ago, in the twenty-eighth year of his age. Mr. Stanford, who succeeded the late James Wyld, of West Strand and Charing Cross, as Geographer to the Queen, founded the well-known business of "Edward Stanford"—sellers and publishers of maps and geographical and topographical works, and sole agents in London for the publications of the Ordnance Survey; retired from business some years ago. The firm removed from No. 55, Charing Cross, on the completion of their present premises, Nos. 26-7, Cockspur-street, in 1889, erected for them upon the site of the British Coffee house, after designs by Mr. Thomas Barnes-Williams, which were illustrated in the *Builder* January 12, 1889. Those premises having been purchased by the London County Council for purposes of their staff in 1901, the firm selected additional premises at Nos. 12, 13 and 14, Long-street, as their chief establishment for the housing of their complete stock of the Ordnance maps, transferred their general (not geographical) bookelling and stationery departments to Messrs. Hugh Reed, of No. 124, Pall Mall, and, having removed the front shop in Cockspur-street, retained it as a place of retail business for the sale of their own publications as well as of maps and geographical books.

GENERAL BUILDING NEWS.

RESTORATION SCHEME, BERWICK PARISH CHURCH.—A commencement has been made in the scheme for the enlargement and restoration of the parish church. The architects are Messrs. Hicks & Charlewood, diocesan architects, Newcastle, and the main features of the improvements are:—(1) The entire removal of the existing north and south gables; (2) the construction of an organ chamber on the north side of the chancel, and removal thereto of the organ; (3) rearrangement and extension of the west gallery, consequent upon the removal of the transept, with a new staircase and additional vestry; (4) provision of a new system of heating and ventilation. The total number of sittings in the remodelled church is to be 354. The work has now begun on the construction of the organ chamber. The contract for the improvements is in the hands of Messrs. J. & S. Sons, masons, Berwick.

CHURCH, LINCOLN.—A new church was consecrated at Lincoln on the 5th inst. by the Bishop of Lincoln. The new Church of All Saints consists of a nave, with north and south aisles, chancel, with transepted organ chamber on its south side, and a transept on the north, with a choir vestry opening out of it, and a sacristy outside the east end of the chancel. A stained-glass window has been placed in the east end by Messrs. Clayton Bell. At the west end, under the three towers, is a font, carved in red stone, and opening on two steps. A large organ is being built for the church by Messrs. H. & S. Sons. Externally the church is of red brick, with Bath stone dressings, while the faces of the walls are plastered. The roofs are covered with red tiles. The contractors for the church were Messrs. Otter & Sons, of Lincoln; Messrs. Bowman & Sons, of Bedford, for the oak work; Mr. Milburn, of York, for the font and carving; Mr. C. Gory, of Lincoln, for the electric lighting; Messrs. Richardson & Co., of Darlington, for heating; Messrs. Laidlors, of Durham, for brass standards; and Messrs. Patterson & Co., of Durham, for altar frontals, hangings, and other textile fittings. Mr. A. Gordon Clerk of the works, and the architect was Mr. C. Hodgson Fowler, F.S.A., architect, Durham.

CONGREGATIONAL CHURCH, NEWLAND, HULL.—Foundation-stones were laid a short time ago of a new Congregational church, which is being built at Newland. The building is intended to provide 803 sittings, 634 in the body of the church and 169 in the gallery. The church vestries, with a church parlour, and a school, will be provided. The total inclusive of all charges, is estimated at £12,000. Mr. J. H. Messers, Bowman & Sons, of Bedford, are the contractor for the work, the architects being Messrs. G. & S. Porritt, of Manchester.

MEMORIAL CHAPEL, TOTLAND, ISLE OF WIGHT.—A memorial Bible Christians are erecting a memorial chapel at Totland Bay. Mr. S. E.

Tomkins, of Newport, is the architect, and Messrs. J. Ball & Son, of Cowes, are the builders. The chapel will be built of Swage stone and Bath stone dressing, and have a length of 55 ft. and width of 36 ft. The height to the walls will be 22 ft. 9 in., and to the apex of the roof 46 ft. The pitch-pine pews are to seat 260 worshippers. The rostrum, behind which is to be the choir gallery, will be constructed of pitch-pine. The minister's vestry and the stewards' vestry will be situated on each side of the rostrum, while at the entrance to the building there will be a vestibule with granite columns.

SYNAGOGUE, NEW CROSS-ROAD, LONDON.—The new South-Eastern Synagogue in the New Cross-road will provide accommodation for 200 men and 150 women. The building cost £5,000. Mr. Delissa Joseph and Mr. C. P. Roberts were the architect and builder respectively.

SCHOOL, LOUGHBOUGH.—Upon the site of the Cobden-street Board Schools, Loughborough, which were partially destroyed by fire about a year ago, has been erected a new school. At the new school accommodation is provided by a two-story building on the Cobden-street frontage, the girls being allocated to the ground floor, and the boys to the first floor. The accommodation provided in the new building is for 300 girls and 300 boys, while the classroom formerly belonging to the girls' school has been restored and added to the infants' department. The building consists of five classrooms on each floor, each classroom arranged on either side of a corridor, 10 ft. wide, and extending from end to end of the building. The two classrooms in each department are divided by removing partitions, so as to be thrown open into one. Separate sitting-rooms for teachers are provided. The floors and staircases of the building are of fireproof construction, but in order to avoid any risk of fire an iron staircase is provided on the outside of the building, approached from the main corridor by a door fitted with panic bolts. An additional exit has been made for girls upon the ground floor. The floors of the classrooms and corridors are covered with maple boards, and the walls are plastered and lined to a height of 4 ft. with glazed tiles. All the woodwork is in pitch-pine. The staircase floors, cloak-rooms, etc., are of concrete stone. Messrs. Clark & Sons are the contractors, and Messrs. Barrowcliffe & Alcock the architects.

SCHOOL, WEST HARTLEPOOL.—On the 2nd inst., at West Hartlepool, the foundation-stones were laid of a new school situated in Elwick-road. The new building, which will be utilised for the purposes of higher grade education, will be a three-story erection with two-story wings. Accommodation will be provided for 1,200 scholars, divided equally into senior and junior boys' and girls' departments. The third story will provide accommodation for science teaching, and will include a lecture-room, with gallery, and demonstration table, and preparation-room. Over the boys' playshed a room will be provided as a workshop, equipped for instruction in manual work. The building will be lighted by electricity. The school has been designed by Mr. Richard Holt, of Liverpool, and the contractors for its erection are Messrs. T. Beetham & Son, West Hartlepool. The total estimated cost of the new school is £21,041.

COUNCIL SCHOOLS, BROOMHILL, NORTHUMBERLAND.—The new schools at Broomhill, which have been erected by the Northumberland County Council, were recently opened. Mr. J. W. Douglas, architect, designed the buildings, and the contractors were Messrs. R. Carse & Son.

PAROCHIAL BUILDINGS, ST. SILAS'S, BYKER.—The foundation-stone of St. Silas's new parochial buildings at Byker was laid on the 2nd inst. The new buildings are situated at the corner of Roder-street and Heaton Park-road South. They will contain two large halls, on the first and second floors, with classrooms, etc. The total cost will be 2,500. Mr. A. B. Plummer, Newcastle, is the architect, and Mr. J. L. Miller, North Shields, the contractor.

ST. JAMES THE LESS, BETHNAL GREEN.—The medical mission-house was opened recently, after plans and designs by Mr. E. Hoole. The building, situated within the grounds of the church, includes two consulting-rooms, two dressing-rooms, a waiting-hall, surgery, etc., and the mission will be served in connexion with the Ridley Hall, now in course of being built.

WESLEYAN MISSION CENTRAL HALL, SHEFFIELD.—At a meeting of the Wesleyan Mission Committee, which was held on the 4th inst. at the Norfolk-street premises, Sheffield, the amended designs for the new central hall, on the site of the Norfolk-street chapel, which had been

prepared by Messrs. Waddington, Son, & Dunkerley, were submitted by the Plans Committee. On the proposition of Mr. S. Meggitt Johnson, seconded by Mr. Albert Heath, it was agreed that the plans, as amended, be now accepted by the committee.

FREE LIBRARY, SANDOWN, ISLE OF WIGHT.—The free library, which is to be erected at Sandown, will have a frontage to High-street of about 57 ft., with a little more than that to Victoria-road. A tower, 42 ft. high, is over the main entrance, which will be at the corner. The building will be of white bricks, with slated roof. On the High-street side will be the reading-room, 31 ft. 6 in. by 18 ft., and 14 ft. in height, with a side recess. On the Victoria-road front will be the lending library, and reference library behind. A corridor, 6 ft. 6 in. in width, extends the entire length of the Victoria-road part. Upstairs there is a committee-room, 31 ft. 5 in. by 19 ft. This, it is hoped, may in time develop into a museum. The ladies' room measures 19 ft. by 12 ft. On this floor also will be found the domestic offices for the curator. In the tower provision has been made for the accommodation of a sundial recorder. Mr. E. James, of Binstead, is the builder, and Mr. J. Newman is the architect.

PROPOSED WESLEYAN COLLEGE, BRISTOL.—A new Wesleyan college is to be erected on a site in Hampton-road, Bristol. On the ground floor, besides the entrance hall, will be the inner or staircase hall, common-room for students, library, and dining and assembly hall, which will be carried up the height of two floors and surrounded by a gallery. At the rear of the hall will be the buttery, kitchens, pantries, and rooms for the house-keeper. A committee-room will also be provided, and the necessary cloakroom and lavatory accommodation. The staircase leading to the first floor is in oak, and on this floor are two large lecture-rooms and one smaller one, the gallery of the hall being also reached from this level. Adjoining the college and communicating with it will be the residence of the principal, which will face and be approached from Cotham-road. Bath stone in random courses will be used for facings, with Gloucestershire stone slates for the roof, the stone mullioned windows being glazed with lead lattice panes. The interior will have floors of wood block, some of the rooms being finished with oak panelling. The buildings, in addition to open fireplaces in the principal rooms, will be heated on the low-pressure hot-water system. Mr. H. Dare Bryan, architect, has prepared the plans for the work.

FREE LIBRARY, SALISBURY.—The Mayor of Salisbury (Mr. C. J. Woodrow) laid the foundation-stone recently of the new free library building. The entrance will be at the left hand, or western side, of the front by means of a vestibule, 11 ft. wide, opening on the hall and staircase, which, together, will be 19 ft. wide. The staircase leading to the reference library will be of artificial stone, with iron balustrade. The lending library will be 29 ft. by 30 ft., and will be separated from the hall by a glass screen and the librarian's counter. At the back end of the hall access will be obtained to the reading-room, which will be 61 ft. by 32 ft., and is to be lighted by means of two large lantern lights in the ceiling. Between the lending library and reading-room will be placed the librarian's office, provided with glass sides, so as to command nearly the whole of the ground floor of the premises. On the first floor the reference library will be 40 ft. by 26 ft., and a ladies' room, 17 ft. by 13 ft. 6 in. The premises are to be heated with hot-water radiators, which will be placed in front of the fresh-air inlets. The total cost of the building will be 4,000. It has been designed by Mr. Alfred C. Botbams, and the contractors are Messrs. Harris Bros.

NEW BUILDINGS, LIVERPOOL UNIVERSITY.—Two new buildings for the University of Liverpool have just been opened—new medical buildings and the George Holt Physics Laboratory. The new medical buildings form an addition to, and in some respects a completion of, the equipment of the medical school of the university. It is now some years since the entire block of which they are a part was designed by Messrs. Alfred Waterhouse & Son, of London, and the present buildings have been carried out by Mr. Paul Waterhouse. A polygonal apse at the western angle is the outline of the two theatres—surgical and anatomical—the sloping seats of which are arranged over one another so as to avoid the possibility of loss of space. The basement room below these theatres is a polygonal laboratory. The building contains a professors' common-room, private rooms for the Dean of the Medical Faculty and the Professor of Anatomy, and certain storerooms and workshops,

but with these exceptions the whole of the contents are taken up with laboratories and classrooms, large or small. On the top floor there is, among other rooms, an operative surgery theatre. Special classrooms for materia medica, etc., are placed on the mezzanine between the ground floor and the first, in which the working benches are covered with enamelled iron tops. The external walls are faced, like the other buildings of the university, in ordinary local bricks, with dressings of red Ruaban bricks. The George Holt Physics Laboratory is built in juxtaposition with the new Johnston Bacteriological Laboratory, communicating with it on the external walls corresponding with those of that laboratory, being of common brick with broad courses of red brick and dressings of Storeton stones. The tower is provided for experimental purposes, and is open all the way down, with an electric lift to give access to any portion of it. It is also used for a water-tank. The ground floor of the building comprises an entrance hall, arranged under the high part of the seating of the lecture theatre. From the one side of the entrance hall approach is given to the professor's private room and research laboratory; from the other there is access to the junior laboratory and a classroom. Behind the theatre are placed the preparation-room and apparatus-room. On the first floor are a library, senior students' laboratory, standard-room, sound and light rooms, and dark-room. The second floor is devoted mainly to research for honorary students. A spectroscopic-room is also here, and there is access to an observatory. In the basement are an additional research-room for the professor, a furnace-room, workshop, liquid-air room, and a room for the use of X-rays. There are also a constant temperature-room and stores. The building stands on solid rock, and precautions have been taken to prevent vibration. Messrs. Willink & Thicknesse, of Liverpool, and Professor F. M. Simpson, are the joint architects.

INSTITUTE PREMISES, READING.—Lord Rosebery recently visited Redhill to open the new Colman Institute. The building includes a lecture hall, to be known as "King's Hall," capable of seating over 500 persons. The work has been carried out from designs by Mr. Hubert Gilford, at a cost of about 5,500l.

NEW WARDS, THE LONDON HOSPITAL.—The consecration and opening of four new Hebrew wards at the London Hospital took place on the 14th inst. The new wards are situated on the top floor of the west wing of the hospital, and provide accommodation for twenty-seven men and twenty-seven women. Each ward measures 72 ft. long, 21 ft. wide, and 12 ft. high, and has a sister's room, scullery, bath-room, etc., attached to it. The floors are finished with cement, while the walls throughout are lined with light green opalite. As the wards are constructed side by side—two of them running parallel to the other two—special attention has been given to the ventilation, which is obtained by raised lanterns in the roof along the back of the wards. A large kitchen—to be used exclusively for these wards—and scullery, which are constructed in the centre of the floor, with two wards each side of them, are paved with mosaic, the walls being tiled. A wide balcony is fixed round the south end of the building. The architects are Messrs. Rowland Plumbe & Harvey.

BOYS' BRIGADE HALL, WARLEY.—The 1st Warley Company have just erected new headquarters at Warley. The hall is 55 ft. long and 25 ft. wide, having small non-commissioned officers' room at the rear; the exterior elevations are of rough cast and local red brick, the brickwork inside is left perfectly plain, the woodwork throughout stained green. The heating is by beaten iron fireplaces on the "well fire" principle, and supplied by Messrs. Bratt, Colbran, & Co., the lighting being by Lucas' lamps; the floor is of pitch pine, laid by Messrs. Ellis, Geary, & Co., of London. This building was opened on the 10th inst. by Bishop Taylor Smith, with a silver key designed and presented by the architect, Mr. Hugo R. Bird. Mr. F. W. Burtwell, of Brentwood, was the contractor.

WESLEYAN CHURCH, WAVERTREE, LIVERPOOL.—A new Wesleyan church was opened on the 4th inst. in Elm Hall-drive, Penny-lane, Wavertree. The scheme comprises the erection of a church to seat about 300 people. Adjoining this site a school-chapel has been built at a cost of between 4,000l. and 5,000l., this being the building which has just been opened. The structure is of red Ruaban dressed brick, with Portland stone facings. The large hall will seat about 500 people, and there are vestries, cloakroom, classroom, a ladies' parlour, and other accommodation.

On the upper floor is a smaller hall, which will seat about 300 people. The construction of the building has been superintended by Messrs. Gilbert Fraser and Arnold Thornley.

POLICE STATION, STRADFORD, SUFFOLK.—The erection of the new police station at Stradford has now been completed. The work has been carried out by Messrs. E. Rumsey & R. Butcher, builders, under the supervision of Mr. Henry Miller, the County Surveyor.

STAINED GLASS AND DECORATION.

WINDOW, ST. GEORGE'S CHURCH, BRISTOL.—A large stained-glass east window has just been placed in the Church of St. George, Bristol, containing five lights and tracery. The centre light depicts the Crucifixion, the other four illustrating the Baptism of Our Lord, St. John, the Virgin, and The Supper at Emmaus. All the subjects are crowned with canopy work, angels with outspread wings appearing in the tracery, and at the bottom of the two outside lights. The work has been executed in the studio of Messrs. Percy Bacon & Brothers, of London.

SAVITARY AND ENGINEERING NEWS.

WATERWORKS, MAESTEG.—The new reservoir, which is being constructed by the Maesteg Council, is situated at the head of a valley on the mountain side at a spot known as Blaencwm-ceryn. The gathering area comprises about 200 acres, situated at the top of the mountain. An earthenwork impounding dam is being constructed across the valley to form a reservoir, with a storage capacity of 30,000,000 gallons of water. A puddle trench wall will be constructed through the middle of the dam, from the bottom of the puddle trench to within a few feet of the top of the embankment. An outlet tunnel is being constructed through the side of the hill, clear of the dam, through which the supply pipes will be carried, and also the sludge or wash-out pipe. A cast-iron water-tower will be erected from the bottom of the reservoir, rising above the highest water level, in which sluice valves will be fixed to draw off the water at different levels for supplying the town. The inner slope of the dam will be pitched with stones on edge, and the exit tunnel will be lined with brickwork all through. The actual water area will be 4½ acres. The scheme is the work of Mr. J. Humphreys, C.E., the Maesteg District Surveyor, who drew up the plans. The contract price is 29,000l., and the contractors are Messrs. W. Jones & Sons, Neath.

WIDENING OF UXTON BRIDGE, ABERDEEN.—Plans have been prepared by Mr. William Dyack, the Burgh Surveyor, for the widening of this bridge. The structure at present has a width of 40 ft., but when the proposed alterations have been carried out this will have been increased to 60 ft.

FOREIGN.

GERMANY.—The new exhibition buildings at Berlin designed by Herr Paul Jautschu will be finished on May 1, 1905, and are to open with an exhibition of the German Society of Artists.—The well-known inn "Zum Ritter" at Heidelberg, a Renaissance building of the year 1592, is to be restored under the direction of Herr Otto Lindle.—The Museum of Armoury at Munich, designed by Herr Meltinger, and built at a cost of 2,750,000 francs, is nearly completed.—The Diocesan Museum in connexion with the cathedral at Treves was opened on October 3.—An exhibition took place in October at the ancient "Red House," in Treves, of a collection of household furniture and utensils used by ancient inhabitants of the Saar, Biele, and Mosel districts; the collection was left to the town by Professor Kraus, a native of Treves.

AUSTRIA.—A "Peoples' Palace" is being built at Vienna, from the plans by Herr von Neumann; the building is to contain a large hall for dramatic representations, a concert hall to accommodate 200 persons, some small lecture-rooms, a reading-room with a library attached, a canteen, a club-room, and living accommodation for the officials.—The new chapel connected with the asylum of district XIII. in Vienna is to be designed by Professor Otto Wagner.—The Austro-Hungarian Bank at Buda Pest is completed; the building was designed by Herr Ignaz Alpar in Renaissance style, and was erected at a cost of four million francs.—The restoration of the cathedral at Salzburg, which was undertaken by Herr Josef Eigl in May, 1899, will be completed in the spring.—Herr German Wanderley, Professor of Architecture at the German State School, died at Brin on October 31 in his sixtieth year.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Professor Henry Adams, M.Inst.C.E., recently retired from the City of London College, where for thirty-five years he has been head of the engineering department; however, continuing his practice as a consulting engineer at 60, Queen Victoria-street.

IMPROVEMENTS, MANGOTSFIELD, GLOUCESTERSHIRE.—At the parochial office, Stapleford on the 28th ult., Col. Langton, M.Inst.C.E., conducted an inquiry concerning an application from the Warmley Rural Sanitary Council for sanction to borrow 800l. private street works in the parish of Mangotsfield and 400l. for the purposes of lighting in the parish. Details as to proposed works were given by the Surveyor, Mr. H. Bennett.

ANCIENT CROSSES AND HOLY WELLS OF CASHIRE.—The seventh of a series of papers "The Ancient Crosses and Holy Wells of Cashire," which have been prepared by Henry Taylor, F.S.A., the President of the Lancashire and Cheshire Antiquarian Society, held on the 11th inst. at the Cheshire Library. The paper was read by Mr. Taylor. It dealt with the Hundred of Salford. The inland position of this part of Lancashire, which consisted in the 14th Ages of wild, uncultivated moors, did not, Mr. Taylor said, tempt the monks to settle here, and consequently there were only a few institutions of this character in the Hundred of Salford—Kersal Cell and the Manor of Collymore. Among the ancient crosses in the hundred were those in the parishes of Manchester and Salford, destroyed in the first quarter of the 17th century, and both probably many times rebuilt in the course of time.

There were, besides a pre-Norman cross at other early sculptures at Bolton-le-Moors, a portion of a pre-Norman cross found on the banks of the Irwell near Eccles, and crosses at Bolton-le-Moors, Rochdale, Stretford, Ashton-under-Lyne, and in some other towns. In all Mr. Taylor collected information about thirty crosses in this hundred. The derivation of the word Salford had, he said, by some supposed to mean the ford over which was brought from the Cheshire mines, and his researches had led him to form a different conclusion. He considered that the word derived from the Anglo-Saxon *Sallow*—for in numerous instances throughout England the name Salford occurs (Tonbridge, in Kent) far away from salt and invariably in low-lying situations near marshy banks of rivers, where the word Salford in the ancient charters of Tonbridge was unquestionably derived from the willows, or poplars, which grow so abundantly on the banks of the Medway. In Lancashire instances of similar positions near Blackburn, Bolton, and Clitheroe. Again, leading down from Eccles market-place, where were ancient market crosses, Salter's-lane took one ancient ford over the Irwell at the very place where the shaft of a pre-Norman cross was found in making the Manchester Ship Canal. The shaft is now preserved in the Museum. "Salford" means the ford over the willow tree. Manchester had its name to which cripples were carried on horse or barrows, and it might be hoped that the sufferers were actually cured, miraculously or not. The site was in New Bailey-street bridge. A curious tradition of the tenacity of ancient customs to be found in John Byrom's "Memoirs" is there recorded how in times of dearth—as on the arrival of the Pretender in Chester—the people met for common mutual protection at the Manchester cross, and it was here—at the market of Manchester, Salford, and Bolton—that John Wesley preached to tumultuous multitudes in the middle of the eighteenth century.—*Manchester Guardian.*

MILTON MEMORIAL, CRIPPLEGATE.—A statue of Milton, standing at the entrance of St. Giles', Cripplegate, was recently unveiled by Lady Alice Egerton. Bas-reliefs in stone adorn two sides of the base, which is decorated on the east representing the expelling of Adam and Eve from the Garden of Eden, the Archangel Michael; while that on the west is of a scene from *Comus*. Mr. Montford was the sculptor, and Mr. Hammond the architect, of the monument.

WAR MEMORIAL, BTRY ST. EDMUND'S.—A memorial which has been erected at the entrance of the officers and men of the Suffolk Regiment who lost their lives in the South African war, was unveiled on

est by Lord Methuen, G.C.B. The monument stands upon the Cornhill, and it has been designed and executed by Mr. Arthur George Walker, sculptor, of London.

ST. ERIC'S CHURCH, NEWTON, CORNWALL.—New altar rails have been placed in this church. They are of XVth century Gothic design, and have been executed in oak by Messrs. Harry Hems & Sons, of Exeter.

THE SLATE TRADE.—A meeting of the Fossing Quarry proprietors was held on the 10th inst., and it was decided to continue the present prices and terms for 1905. The Cornwall Slate Quarry owners have not yet issued their lists for next year, but it is believed that uniform prices will be arranged for all the quarries working on the Bangor vein. This will have the effect of steadying trade, which has been rather disorganised the last few months.

Legal.

BUILDING OWNER AND ARCHITECT: QUESTION OF THE OWNERSHIP OF DRAWINGS.

THE case of Gibbon v. Pease came before Mr. Justice Ridley, sitting without a jury in the King's Bench Division, on the 15th inst., a motion by Mr. Henry Gibbon, of Kent House, Ealing, against the defendant, Mr. Charles Edward Pease, of No. 15, Clifford's-inn, E.C., for delivery up of certain plans, specifications, papers, and writings which the plaintiff alleged the defendant had wrongfully retained. There was also a claim for damages.

Mr. Danckwerts, K.C., and Mr. H. Gatehouse appeared for the plaintiff, and Mr. T. Kemp, K.C., Mr. P. B. Morle, and Mr. Simmonds for the defendant.

Mr. Gatehouse, in the absence of Mr. Danckwerts, opened the plaintiff's case. He said the action was brought to recover from the defendant, who was an architect, the possession of some plans, specifications, papers, &c. The defendant, in his statement of defence, set up that there was a custom in his profession which entitled him to detain the plans and other papers. The defendant also said that, in October, 1903, differences arose between him and the plaintiff with regard to the work and the claim of the defendant to the plans and other papers, and that, in November, 1903, the plaintiff paid, and the defendant accepted, a sum of money in satisfaction of all differences, and that the plaintiff's claim in this action was thereby satisfied and discharged.

Mr. Kemp said that his learned friend need not trouble himself with the second point in defence.

His lordship: Then the only question is whether the plans, etc., belong to the architect?

Mr. Kemp: Yes.

Mr. Gatehouse, continuing, said that the facts were these:—In September, 1902, Mr. Henry Gibbon, the owner of certain premises in the Queen's-road, Bayswater, was desirous of converting several of a row of houses, which were shops, into flats, and the plaintiff was introduced by a firm of house agents to Mr. Pease, and Mr. Pease was employed by the plaintiff as the architect for the purpose of carrying out the conversion of the shops into flats. A contract was entered into with a firm of contractors in October, 1902, and the work was proceeded with, and Mr. Pease did the usual work of an architect in preparing plans, specifications, and bills of quantities.

At this stage Mr. Danckwerts came into the court, and, by leave of his lordship, continued the opening of the case. He said that the question to be decided was a comparatively simple one from some points of view. The real question was whether an employer who employed an architect for reward to make plans for him, and to supervise the building operations, was entitled to have the plans paid for by the employer.

His lordship said he thought that matter had been settled in the case of Ebdy v. McGowan.

Mr. Danckwerts said he thought that the question in that case settled the point.

Mr. Kemp remarked that his contention would be that the facts in that case were to be different from the facts in this case.

Mr. Danckwerts, continuing, said that the plaintiff employed the defendant to do the work in question on the usual terms, and that the defendant should receive for his services 5 per cent. on the contract price. For the purpose of preparing the plans the plaintiff lent the defendant the original plans of the buildings, and the defendant was to return them to the plaintiff on the day on which they had been built. The contract with the builders was dated

October 24, 1902. His lordship would see that the plans which were then in course of being prepared by the defendant were made part of the contract. It was also a condition of the contract that the work should be carried out under the direction and to the satisfaction of the architect. Amongst other things water fittings had to be put in the premises. These fittings were put in, but the water company, not being satisfied with them, some question arose between the plaintiff and the defendant in that respect. The plaintiff, having employed a plumber in the neighbourhood to satisfy the water company, there arose a dispute as to what sum the defendant was entitled to. Eventually the defendant was paid his charges. In the meantime Mr. Gibbon had been asking Mr. Pease for the plans he had prepared for him, and the other documents belonging to him in the possession of the defendant. Mr. Pease refused, however, to deliver them up, and set up a claim to them. He (counsel) thought it was old law that when you employed somebody to do something for which that somebody was paid, it was an implied term of the contract that the result should belong to the employer. Mr. Pease apparently said no. He set up the defence of custom. The custom to be good must be universal, well known, and generally acted on. The Institute that looked after the interests of architects had, he thought, always accepted the ruling in Ebdy v. McGowan.

His lordship: I do not think I need trouble you further, Mr. Danckwerts. I say there is no custom. The architect is not entitled to plans I have paid him for.

Mr. Kemp said that the plans in question were probably not of value, but there was no doubt that this was a *bona fide* and honest dispute between two persons as to who was entitled to certain documents. The statement of claim was, of course, in *detinue*, and the plaintiff could not succeed unless he could prove that the various documents were his property. That was how the claim was based. If his lordship looked at the particulars, he would see what the plaintiff claimed.

Mr. Danckwerts said that the plaintiff would be satisfied if the defendant returned the signed plans he had prepared for the purpose of carrying out the work, and the specifications.

Mr. Kemp said he should be able to show that the defendant was employed by the plaintiff, not only as architect on the ordinary terms, but also as a quantity surveyor. As a rule the quantity surveyor was a person other than the architect. In many cases it was not desirable to employ the architect as a quantity surveyor. Different principles applied to the documents he prepared as quantity surveyor than to those he prepared as architect.

Mr. Danckwerts said he thought he could clear the ground on this point. What he wanted were the builder's priced lithographic bills and their day work sheets.

Mr. Kemp submitted that what the contract was, was this. The plaintiff being desirous of converting the shops into flats got into communication through another gentleman with the defendant. This gentleman saw the defendant and asked him to prepare certain drawings for the alteration of the buildings. That was done, and they were shown to the plaintiff. The plaintiff made certain alterations, and the result was that Mr. Pease was asked to reconsider the matter, and he prepared some more plans to be shown to the plaintiff some few days before the contract was ever entered into at all. These plans were shown to the plaintiff before there was any contract of employment. On September 9, 1902, Mr. Pease was appointed for the purpose of doing what? He was to have the ordinary fee of 5 per cent. on the contract price, and for that he was to do this:—He was to see that certain buildings were altered in accordance with certain plans approved of by the plaintiff, and after that was done, he submitted, with some confidence, that the plaintiff had got all he bargained for, and that was his claim in the action, and the plans would not belong to him at all. The next thing that happened was that, some few days afterwards, the defendant was employed as quantity surveyor at the ordinary charge. That came out of the pocket of the contractor. On this head all the plaintiff now claimed were the priced lithographic bills and the day work sheets. The priced lithographic bills were sent to the quantity surveyor entirely for his own use, and with these the building owner had nothing whatever to do.

His lordship said he should follow the ruling in the case of Ebdy v. McGowan

unless Mr. Kemp could show him that there was an express contract between the parties that the plans, etc., should belong to the defendant. If he did not do that he should hold that they belonged to the plaintiff.

Mr. Kemp said he hoped to establish a custom in the profession that the plans under such circumstances belonged to the architect. It could not be reasonably suggested that such a contract was an unreasonable one. The plans were prepared simply for the purpose of enabling the architect to see that the buildings were constructed in accordance with the approved design. If architects were bound to hand over these papers immediately at the conclusion of the work, they would be left in an absolutely hopeless position, and if they were attacked at any time they would be unable to protect themselves.

His lordship: Unless there is any contract to the contrary I say that the plans belong to the building owner.

Mr. Kemp: Well, I shall tender evidence of custom that, in the circumstances of this case, the plans and specifications and details are the property of the architect.

His lordship: I do not think I ought to receive it. I do not think there is any distinction between this case and Ebdy v. McGowan. I think that this is an attempt to break the law. You must make your terms if you want to keep the plans.

Mr. Kemp: Will your lordship grant me a stay of execution.

His lordship: What about the quantity surveyor documents?

Mr. Simmonds (after consulting with his client): We do not claim them. We will abandon our claim to everything but the plans and specifications.

Mr. Kemp said that those papers were quite enough on which to raise the question of principle. He asked for a stay of execution for three weeks, and if the defendant entered an appeal within that time, a stay until the hearing.

His lordship: Yes.

In answer to his lordship, Mr. Kemp stated that the defendant would undertake to hand over to the plaintiff the documents in question if the Court of Appeal affirmed his lordship's judgment.

His lordship said that on that understanding he would only give the plaintiff the nominal damages of 1s.

Judgment accordingly.

THE WIDENING OF QUEEN-STREET, HAMMERSMITH.

THE case of Parry v. the Metropolitan Borough of Hammersmith came before Mr. Justice Warrington, in the Chancery Division, on the 15th inst., on a motion by the Vicar and Churchwardens of St. Paul's Church, Hammersmith, for an interim injunction to restrain the defendants from enforcing the compulsory powers given them by Michael Angelo Taylor's Act, under which the defendants proposed to acquire a portion of St. Paul's Churchyard for the purpose of widening Queen-street, Hammersmith. The application was based on the ground that the defendants were not *bona fide* exercising their statutory powers for their own purposes, but for the purpose of assisting the London County Council compulsorily to acquire the land for the purpose of their Queen-street improvement.

It appeared that the London County Council, by an Act passed in 1902, acquired power to construct an electric tramway along, amongst other streets, Queen-street. The defendants opposed the Bill when it was before Parliament on the ground that Queen-street was too narrow for the purpose. Subsequently the defendants withdrew their opposition on the London County Council agreeing to widen the road if they could get the necessary consents. The defendants agreed to assist in obtaining the necessary consents, and to bear one-third of the expense of widening the street. To do this work of widening the street it was necessary for the London County Council to acquire a portion of the churchyard. As the County Council could not come to terms with the plaintiffs as to purchase of the land, and the County Council had no power to acquire the land compulsorily, they requested the defendants, in July, 1904, to put into force the powers they had under Michael Angelo Taylor's Act for the compulsory acquisition of the land required. On July 27 the Borough Council held a meeting at which a report from their Law and Parliamentary Committee was presented, the Committee recommending that the Borough Council should grant the County Council its aid by putting in force its statutory powers

under Michael Angelo Taylor's Act. The Borough Council passed a formal resolution agreeing to do this, and appointed the solicitor and valuer of the County Council to be the solicitor and agent of the Borough Council for the purpose of acquiring the land in question. The defendants served notice to treat on the plaintiffs, and ultimately the present action was commenced. The plaintiffs' case was that the adjudication of July 27 was void, as being *ultra vires*, and was a device for getting their property for the County Council, which deprived them of the right they had of appearing before the Parliamentary Committee and opposing the County Council Tramway Bill when they might have got the tramway route altered, or have obtained ample compensation for their land.

In the result his lordship refused the motion, holding that the plaintiffs had not shown any want of *bona fides* on the part of the Borough Council, who, in his opinion, were exercising the statutory power on their own behalf with a view of facilitating improvements which they thought desirable.

Mr. Spence appeared for the plaintiffs, and Mr. Norton, K.C., and Mr. Methold for the defendants.

ACTION BETWEEN PROPERTY OWNERS IN BERKELEY-SQUARE.

The case of *Hall v. Lewis* came before Mr. Justice Buckley in the Chancery Division on the 10th inst.

Mr. Astbury, K.C., and Mr. Ashton Cross appeared for the plaintiff, and Mr. Buckmaster, K.C., and Mr. Holmes for the defendant.

Mr. Astbury, in opening the case, said the action was brought by Mrs. Hall for the purpose of recovering damages for an injury she had sustained to her house, No. 2, Berkeley-square, by reason of damp percolating through from the adjoining premises, No. 3, Berkeley-square. The plaintiff was leasee for a term of fifty-five years of her premises. Defendant recently purchased and was now the lessee of the adjoining premises. His case was that defendant allowed water to accumulate in the basement of his premises and failed to keep it in, and it percolated through the lower part of the plaintiff's house. It had cost 89l. to put the matter right. Defendant had done some work, and the matter complained of had, it appeared, been stopped. An injunction had been asked for, but there was no necessity for that now, and they simply asked for damages. The damp had soaked the party wall and spread through to the plaintiff's floors.

Mr. Buckmaster: The Tyburn runs at the rear of these houses.

Mr. Astbury: I thought it was a mews there.

Mr. Buckmaster: The Tyburn is covered in now. I have seen leases on this property giving the right of fishing in the Tyburn.

In the result his lordship, after hearing evidence, said he had no doubt that at some period the soil of the houses was a water-bearing strata. But it was not proved that the defendant allowed water to accumulate in his basement. The owner of No. 3 had made his basement watertight. In his lordship's opinion it was not proved that the damp came from No. 3, and that was the only question he had to consider. To his mind the party wall sucked up the damp from the water-bearing strata, and that was how the mischief was caused. The plaintiff had not proved her case, the onus being upon her. The action would be dismissed, with costs.

LIABILITY ON PLASTERER'S CLAIM UNDER WORKMEN'S COMPENSATION ACT.

The case of *Evans v. Cook-Lancashire and Yorkshire Insurance Company, Ltd.*, third parties, came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 10th inst., on two appeals from the judgment of Mr. Justice Wills at the Nottingham Assizes.

The action was brought by a contractor against the defendant, a sub-contractor, to recover 84l. 5s. 3d. paid to a workman named Fraime who was in the employment of defendant, and who had been injured by an accident which arose out of and in the course of his employment. The plaintiff also claimed any other sums which he might pay to the workman down to the date of the judgment and a declaration that defendant was liable to indemnify him in respect of future payments.

It appeared that in July, 1901, plaintiff, under a contract, was constructing a workhouse infirmary at Nottingham, the defend-

ant entering into a sub-contract with the plaintiff to execute the plastering work necessary for the building. On July 9, Fraime, while at work on the plastering, met with an accident, notice of which was given both to the plaintiff and the defendant under the provisions of the Workmen's Compensation Act, 1897. The plaintiff immediately agreed to pay Fraime 15s. 9d. per week, being half his average weekly earnings, during incapacity. A year afterwards, the House of Lords having in the meantime decided the case of *Cooper and Crane v. Wright*, the plaintiff demanded repayment of the sums paid to the workman Fraime, and brought the present action against the defendant in the High Court. The defendant, then being insured against liability under the Workmen's Compensation Act, 1897, with the Lancashire and Yorkshire Insurance Company, brought that Company in as third parties, claiming an indemnity from them. The Company contended that the plaintiff had no right to sue the defendant in the High Court, but was bound to take proceedings for arbitration under the Act of 1897, and that therefore, as the defendant was not liable in the action, the Company were not liable. Mr. Justice Wills, however, held that the action was maintainable, and gave judgment for the plaintiff for the 84l. 5s. 3d., and for a further sum, calculated at 15s. 9d. per week from the date on the writ up to the date of the judgment. His lordship also made a declaration that the defendant was liable to pay to the plaintiff such sums as the plaintiff might be liable to pay to Fraime under the Act in respect of the accident. He also entered judgment for the defendant against the third parties for payment of the amounts in question to the defendant. Hence the present appeal of the Insurance Company and the defendant, the latter served notice of appeal at the request of the Insurance Company, so that the whole case might be before the court.

Mr. Hugo Young, K.C., and Mr. J. D. Crawford appeared for the Insurance Company, Mr. W. Wills and Mr. T. T. Blyth for the defendant Cook, and Mr. Stanger, K.C., and Mr. McCardie for the respondent on the appeal (the plaintiff).

Mr. Hugo Young contended, on behalf of the Insurance Company, that the action was not maintainable in the High Court, the whole scheme of the Act of 1897 being that all claims thereunder should be decided by arbitration.

In the result their lordships, without calling upon counsel for the respondent, held that such an action as the present was maintainable, and dismissed the appeals, with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

25,374 of 1904.—H. C. MICHELL and D. S. MICHELL: *Manufacture or Production of Material Suitable for Use as a Non-conducting Covering for Steam Pipes, Boilers, and other bodies.*

A non-conducting material composed of or containing flake mica, consisting of a binding material such as clay that is normally dry, and is capable of forming a plastic binding agent when mixed with water, and fibrous material, for example, asbestos fibre, the mica and fibrous material being more or less uniformly mixed together, and the binding agent being more or less uniformly distributed amongst and firmly attached to the flake mica or flake mica and fibrous material so that it will not become readily detached therefrom during transport, and so that upon addition of water to the mixture the latter can be readily formed into a plastic mass.

27,488 of 1903.—R. A. BREARE: *Hoists.*
This invention relates to a hand-operated hoist, applicable mainly for the transport of light articles, at comparatively high speeds, between the various floors of shops, warehouses, and other buildings. In constructing this hoisting apparatus a suitable counter-balanced cage is employed suspended by means of a rope fastened over a grooved pulley, which is keyed on to the main shaft of the apparatus. This shaft carries a two-compartment drum which is arranged on the free wheel principle, that is to say, the drum is adapted to rotate freely upon the shaft independent of the motion of the shaft itself. Upon one compartment of the drum is wound the hand rope for actuating the hoist, whilst the other compartment carries a counter-weighted rope wound in the opposite direction. The aforesaid shaft carries also a pair of ratchet wheels

keyed thereon, one on each side of the drum, one of these ratchet wheels engaging with a travelling pawl carried by the drum, and the other engaging with a stationary pawl forming an independent support. A trip bar is provided by which the two pawls may be released from their respective ratchet wheel by the rope which actuates the said trip bar being connected also to a suitable band or

27,727 of 1903.—J. S. GABRIEL: *Treaders, Stairs, Floors, and the like.*

According to this invention a tread for a floor, and the like consists of a metal plate having grooves in it to receive bars, lead, or the like, the bases of which are formed to fit the grooves in the plate. The spaces between the bars are filled with cement or other similar substance which, with the bars, forms the top of the tread. Preferably the grooves are of dovetail section, and the bases of rail section, and made in short lengths. Preferably also the base plates are provided with vertical longitudinal flanges on one or both edges of their upper faces. By means of a durable tread is provided that can be easily constructed and easily broken when it is desired to repair it.

27,853 of 1903.—W. WILLIAMS and F. COLLINS: *Means for Securing Door and Handles to their Spindles.*

This consists in securing door and like handles to their spindles by means of a baffle plate the like made in two portions, and adapted when in position and fixed to the door to engage a groove or flange in or on the end of the handle.

27,908 of 1903.—J. H. J. B. PITTER: *A Combination Household Dust Bin or Receptacle or Receptacle and Sifter.*

A combination household dust bin or the closed receptacle and sifter, comprising a receptacle with means to close same, a cylindrical volute or nautilus or similar-shaped reticulated cage, sieve, or sifter arranged and adapted to be revolved or reciprocated around a shaft or axis horizontally disposed thereabouts in said receptacle, and means to revolve or reciprocate said cage, sieve, or sifter from the exterior of the receptacle.

28,128 of 1903.—J. H. DOUGLAS: *Construction of Hinged Window Sashes.*

This relates to windows, and consists in use of hinges which permits of the lower sash being raised, and, when thus raised, provides means for pivoting or supporting such sash so that it may be bent inwardly.

28,141 of 1903.—FRASER & CHALMERS, LTD., F. L. WHITMORE: *An Adjusting Link for Hoisting Cages, and the like.*

An adjusting link for hoisting cages, and the like, comprising three plates, one of which having transverse grooves or slots on its sides, corresponding projections or ridges on the inner surface of the other plates, bolts or slots in all the plates for enabling them to be bolted together, and a hole or holes in the plates for connecting to a part or attachment.

14,593 of 1904.—A. BOWMAN: *Casement Fasteners.*

This invention relates to casement fasteners, and commonly known as "cockspur" fasteners, in their various kinds. The main object of this invention is to provide a fastener of the above-named type, which can be readily adapted for use either upon a right- or left-handed casement. To adapt the fastener for use on a right and left handed casement, it is constructed in the following manner:—The short arm or tongue of the fastener which engages with the hook or ratchet plate on the casement frame, is separated from the handle part, and the latter will fit on the inner surface of the ratchet plate in either room in use. The upper part of the handle is connected to the aforesaid short arm or tongue, at right-angles or approximately the same, by passing it through a vertical hole in the short arm, the upper part of the handle projecting above the top of the eye.

18,142 of 1904.—C. W. HUNT: *Hoisting Apparatus.*

A hoisting apparatus, consisting in the combination of two drums loosely mounted on an equalising gear in operative relation to both drums, means to apply power to the equalising gear, a brake for said equalising gear, and an independent motor operable independently of the said means to apply power to one of said drums.

18,143 of 1904.—C. W. HUNT: *Hoisting Apparatus.*

A hoisting apparatus, consisting in the combination of an equalising gear, two drums mounted on axes independent of the equalising gear, loosely mounted baffle gear

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

engagement with said equalising gear, transmitting gearing between the baffle gears and said drums respectively, and means to apply power to the equalising gear.

18,278 of 1904.—B. E. BEHTLE: Method of and Apparatus for Drying Bricks and other articles.

A dryer, consisting in the combination, a hot-air flue having a top opening, means to support a row of brick stacks along said opening, and a fabric hood or covering along said row of brick stacks, said covering formed in sections, each section comprising a top framework, the fabric extending over the framework and having depending curtains.

3,902 of 1904.—E. R. PALMER: Automatic Flushing Siphons.

An automatic flushing siphon wherein by giving the connecting bend of the discharge limb and seal a rising gradient or curve from approximately where it leaves the vertical portion of the seal, the foot of the air column when on the horizontal plane which it reaches is just before escaping through the seal, is caused to extend beneath practically the whole length of such bend to close to the commencement of the vertical rise of the seal, and is increased in area.

10,172 of 1904.—M. D. HELFRICH: Water-closet Bowls.

This consists in constructing a closet bowl with a trap seal whose passage or outlet is of uniform area throughout, a main supply passage leading to the trap seal on the opposite side thereof from its outlet or discharge, said main supply passage being of uniform area in cross section to the water line of the trap seal, and gradually diminishing in area from said water line to its communication with said seal, and having a hollow rim and a passage opening upwardly from the main supply passage to and opening into the said hollow rim.

2,726 of 1903.—C. E. LIVESAY: Means or Apparatus for Admitting Water from Rivers and other Waterways into Hydraulic Works.

A dock connected to a river through an entrance lock, the means for admitting water to the dock as the river rises consisting of paddle wheels, or other suitable positively-operated devices that draw water from the river and deliver it into the dock to prevent low through the entrance lock, whereby the channels conveying the water can be fitted with appliances to prevent or impede the ingress of the greater portion of silt.

6,655 of 1903.—C. H. ROBOTTON: Apparatus for Making Artificial Stone Blocks.

A hinged or pivoted platform vibrated by revolving cam wheels, and supported by eccentric means, whereby the amount of vibration may be regulated.

7,328 of 1903.—J. TAYLOR: Ventilating Buildings, Vessels, and other Confined Places.

A method of and apparatus for ventilating buildings, vessels, and other confined places, consisting principally in combining with a main horizontal feed pipe connected with a revolving fan, or the like, of horizontal arms extending therefrom, and having pendant pipes at their extremities, the lower ends of such pipes being closed by means of a cap or disc of larger diameter than the said pipes, and the latter being perforated with small holes above such caps or discs.

7,479 of 1903.—A. BROWN and H. G. CLARKE: Apparatus for Drying, Heating, Coaling, and Mixing Granite, Slag, Stone, or other Materials with Tar, or the like.

According to this invention the body of the apparatus may be constituted of a fixed cylindrical chamber set in an inclined position, on the underside of the lower end of which is a furnace-box. Above this chamber is a tank made preferably in the form of a saddle to fit in or form part of the wall of the chamber. The tank which is for holding and heating the tar or the like material, is preferably situated above the fire-box, and is made of any required capacity; it may also be divided by a partition into two compartments.

8,716 of 1903.—H. L. DOUTON and W. DENNISON: Making Moulds for Casting Baths, Cisterns, and similar articles.

This invention relates to moulds for casting baths, cisterns, and similar articles. Hitherto, in moulding a bath, a loose pattern has been employed, the procedure being to place the pattern on a flat ramming-up board, the latter being inverted. A box is then placed over the pattern, sand placed therein, and rammed upon the pattern, the box part and pattern being then turned over, and any excess part placed on the top of the sand being filled into the hollow of the pattern

and forming the core for the bath. When the core is formed the two box parts are turned over again, one of the box parts being lifted away from the other, the pattern withdrawn, and the box placed together again ready for casting.

483 of 1904.—L. W. CROSTA: A Joint for Sanitary Tubes, Conduits, and the like.

This consists in the combination with an ordinary earthenware or similar pipe socket of a joint ring, the inside of which is so formed as to provide two bearings for the spigot end of the inserted pipe to rest upon for forming a true invert.

3,351 of 1904.—T. MACHARACEK: Scaffolding.

A scaffolding frame, for use in working on house fronts, with sockets let into the wall of the building for fixing the frame supports, the distinguishing feature being that rods are employed as frame supports, the free ends of which are connected together either directly or with the aid of couplings through the medium of rods adjustable by means of tension fastening devices, the rods being thus crosswise strutted one with the other, and suspended against the wall of the house.

19,055 of 1904.—O. MESS: Floor, Wall, Ceiling, and other Coverings.

A floor or wall covering, consisting of a foundation of suitable material, a superposed layer of an oil containing cement composition, and a surface layer of wooden blocks united to the intermediate layer and to each other by a suitable wood cement.

19,671 of 1904.—W. L. CALDWELL: Paving Lights, and the like.

A paving light glass of arch form, constructed with a tread portion, locking tongues or shoulders spaced from the tread portion, a supporting base portion, and a plurality of prism portions projecting beneath the tread portion, the reflecting faces of the prism portions extending at different angles with relation to the tread surface.

20,018 of 1904.—T. W. RIDLEY, J. TAIT, and J. D. WILLIAMSON: Slag or Scoria Bricks or Blocks, and the Method of and Apparatus for Manufacturing the same.

A mould for casting slag bricks, consisting of two parts hinged together, one of the parts being slotted to receive the hinge pin so that lateral as well as radial movement of the part and pin relatively to each other is possible.

20,245 of 1904.—A. JACQUES and H. JACQUES: Waterproof Inlaid Floors.

Waterproof inlaid floors, characterised by individually-formed panels or slabs, each one consisting of several plank sections arranged lengthwise side by side provided on their underside with dovetailed grooves, and connected by means of transverse planks having dovetailed projections fitted into said grooves, the underside of each slab being coated with a thin layer of waterproof material, upon which is poured subsequently a strong layer of concrete, or the like.

20,250 of 1904.—J. W. HAYWARD: Glass Facings or Face Plates for Bricks, and the like.

A glass facing plate for bricks, provided with a rib of uniform thickness lengthwise on its back near each edge, and said ribs inclined laterally and terminating back from the end of the facing, thus leaving a narrow-ribbed portion at each end of the brick.

20,257 of 1904.—V. LION: Parquetry.

A member or element for parquetry, characterised by the connexion of the plates by means of screws upon dovetail cross-pieces, and by flat iron bars arranged diagonally relatively to the plates, upon the cross-pieces connecting them.

20,251 of 1904.—W. C. HARDER and C. W. ANDREWS: A Metal Sheet Piling.

This invention has for its object to provide beam piling sections in which the interlocking features necessary in holding the sections loosely together when assembled in a wall structure, is made an integral part of the piling sections which are duplicates of each other, and dispense with the use of a separate locking means mechanically secured to the beams.

SOME RECENT SALES OF PROPERTY.

Table with 2 columns: Description of property and Price. Includes entries like 'ESTATE EXCHANGE REPORT', 'November 3.—By MADDISON, MILES, & MADDISON (at Bungay)', 'Ditchingham, Norfolk.—A freehold holding, 3 a. 3 r. 2 p., L. 200', 'A freehold house, 7 r. 2 a. 4 r. 40', 'Blacksmith's and wheelwright's shop and premises, 1 r. 15 l. 10 s. 250', 'A freehold cottage, 1 r. 15 l. 280', 'Two enclosures of land, 3 a. 2 r. 13 p., L. 150'

Table with 2 columns: Description of property and Price. Includes entries like 'November 7.—By FRITH, GARLAND, & CO. Finsbury Park.—135, Lothair-rd., ut. 73 yrs., r.r. 6 l. 6 s., e.r. 34 l. 20 s. 2300', 'Hartley.—68, Cavendish-rd., ut. 72 yrs., g.r. 5 l. 10 s., e.r. 36 l. 300'

Table with 2 columns: Description of property and Price. Includes entries like 'By LESLIE, MARSH, & CO. South Kensington.—24, Providence-ter., ut. 53 1/2 yrs., g.r. 7 l., y.r. 55 l. 600'

Table with 2 columns: Description of property and Price. Includes entries like 'By NORMAN & SON (at Stratford). Forest Gate.—69, 71, and 73, Tower Hamlets-rd., f., w.r. 62 l. 8 s., g.r. 4 1/2 yrs., g.r. 7 l., y.r. 35 and 37, Stracred-rd., ut. 61 1/2 yrs., g.r. 8 l. 8 s., w.r. 46 l. 18 s. 220', 'Stratford.—38, Victoria-st. (s.), ut. 62 yrs., g.r. 3 l. 10 s., w.r. 32 l. 10 s. 185', 'Totterham.—58 to 79 (even), Templeton-rd., ut. 7 1/2 yrs., g.r. 24 l. 10 s., w.r. 154 l. 14 s. 800'

Table with 2 columns: Description of property and Price. Includes entries like 'November 8.—By ALAN BOOTE. Holloway.—4, Beacon-hill, ut. 37 1/2 yrs., g.r. 8 l. 8 s., p. 300', '21, Beacon-hill, ut. 37 1/2 yrs., g.r. 8 l. 8 s., e.r. 55 l. 435', '32, 36, and 38, Hungerford-rd., ut. 42 1/2 yrs., g.r. 9 l., y.r. 140 l. 1,295', '63, Harbord-rd., ut. 4 1/2 yrs., g.r. 7 l., y.r. 50, Dalmeny-av., ut. 15 yrs., g.r. 4 l. 12 s. 6 d., e.r. 60 l. 440', '13, Hilldrop-rd., ut. 44 yrs., g.r. 3 l., y.r. 55 l. 340'

Table with 2 columns: Description of property and Price. Includes entries like 'By A. G. BONSOR. Teddington, Middlesex.—1 to 12, Victoria-ter., f., w.r. 254 l. 6 s. 2,460', 'Hampton Wick, Middlesex.—School-rd., The Assembly Rooms," also "The Cottage," ut. 82 yrs., g.r. 7 l. 10 s., p. 625', 'Park-rd., "Mayfield," ut. 82 yrs., g.r. 9 l., e.r. 35 l. 250', 'Kingston Hill, Surrey.—Upper-pk-rd., "Torrington," l., e.r. 80 l. 1,350'

Table with 2 columns: Description of property and Price. Includes entries like 'By S. B. CLARK & SON. Caveudish-square.—55 and 56, Welbeck-st., ut. 70 1/2 yrs., g.r. 68 l., y.r. 600 l. 0,600'

Table with 2 columns: Description of property and Price. Includes entries like 'By MILBURN, SON, & CO. Bayswater.—4, Chestow-pl., ut. 39 yrs., g.r. nil, p. 670', 'By ROGERS, CHAPMAN, & THOMAS. Chelsea.—Haker-st., f.g. rents 10 l., reversion in 30 yrs. 340', 'Baker-st., f.g.r. 4 l. 6 s., reversion in 40 yrs. 350', 'Ovington-st., peppercorn g.r., reversion in 40 yrs. 350'

Table with 2 columns: Description of property and Price. Includes entries like 'By STOCKER & ROBERTS. Bernonsday.—5 to 9, Anthony-st., ut. 37 yrs., g.r. 27 l., w.r. 100 l. 340', 'Rotherhithe.—14 to 20, Barkworth-rd., ut. 72 yrs., g.r. 20 l., e.r. 157 l. 4 s. 080', 'Lambeth.—43 and 44, Lower Marsh (s.), ut. 6 yrs., g.r. 40 l., y.r. 75 l. 6 s. 130'

Table with 2 columns: Description of property and Price. Includes entries like 'By WATSON & LEE. Sandy, Beds.—"Sandy-pl.," and 35 acres, f., p. 8,800', 'Rugby, Warwick.—"Westfield House Estate," 106 a. 0 r. 20 p., L. 15,000'

Table with 2 columns: Description of property and Price. Includes entries like 'By DEBENHAM, TEWSON, & CO. Spitalfields.—57, and 59, Hanbury-st. (warehouses), area 5,280 ft., ut. 79 1/2 yrs., g.r. 3 l., y.r. 350 l. 4,000', '61, Hanbury-st., and 23 and 30, Pelham-st. (warehouses), area 4,200 ft., ut. 64 1/2 yrs., g.r. 5 l., p. 3,050', 'Balham.—21, Old Park-av., ut. 84 yrs., g.r. 10 l. 10 s., p. 555', 'Camden Town.—Highest, etc., f.g. rents 400 l., reversion in 7 yrs. 15,860', 'Wellington-st., "The Cricketers" pub., f.g.r. 10 l., reversion in 81 yrs. 3,000', 'Shaftesbury-avenue.—Nos. 87 and 89 (s.), f., y.r. 125 l. 4,160', 'Finsbury Park.—Blackstock-rd., f.g.r. 18 l. 2 s., reversion in 53 yrs. 495', 'Battersea.—Ashton Buildings, f.g. rents 60 l., reversion in 84 yrs. 1,360', 'Rainham, Essex.—Rose Cottages, f.g.r. 10 l., reversion in 44 1/2 yrs. 300', 'Main road, freehold marshland with buildings thereon, 13 a. 2 r. 13 p., f.g.r. 60 l. 780', 'Linehouse.—Nightingale-ls., f.g.r. 15 l., reversion in 57 1/2 yrs. 340', 'Stoke Newington.—Mathias-rd., f.g.r. 25 l., reversion in 71 1/2 yrs. 680', '17, 19, and 21, Wellington-rd., also a plot of land, ut. 6 yrs., g.r. 4 s., 32 l., y.r. 135 l. 18 s. 115', 'Shepherd's Bush.—2, 4, 8, to 18 (even), Coningham-rd., ut. 57 1/2 yrs., g.r. 50 l., w.r. 327 l. 12 s. 2,220', '108, Gayford-rd., ut. 76 1/2 yrs., g.r. 6 l. 10 s., y.r. 230 l. 255', '87, Cobbold-rd., ut. 76 1/2 yrs., g.r. 6 l. 5 s., w.r. 33 l. 16 s. 230', 'Highgate.—2, Norman-villas, ut. 4 1/2 yrs., g.r. 3 l., w.r. 31 l. 4 s. 300', 'Fulham.—31, 33, 35, to 51 (odd), Strode-rd., ut. 71 yrs., g.r. 58 l., w.r. 304 l. 4 s. 1,820', 'Walthamstow.—21 to 27 (odd), Storey-rd., ut. 82 yrs., g.r. 10 l., w.r. 93 l. 12 s. 645', 'November 10.—By J. O. DRYAN. Tooting.—139 to 136 (even), Himley-rd., f., w.r. 135 l. 4 s. 960', 'By DUNCAN & KIMPTON. Finsbury.—69 & 71, Clifton-st. (warehouse, stable, &c.), ut. 16 yrs., g.r. 123 l. 18 s., e.r. 124 l. 785', 'By MONTAGU HOLMES & SONS. Greenwich.—44 and 46, Bridge-st., ut. 55 1/2 yrs., g.r. 5 l., w.r. 57 l. 4 s. 390', 'Bow.—6 and 7, Cantrell-rd., ut. 50 1/2 yrs., g.r. 7 l., w.r. 70 l. 4 s. 255', '47, Lichfield-rd., ut. 39 yrs., g.r. 3 l. 10 s., y.r. 30 l. 250', 'Victoria Park.—91, Approach-rd., ut. 49 yrs., g.r. 7 l., e.r. 40 l. 340', '308, Wick-rd., ut. 49 yrs., g.r. 3 l. 10 s., w.r. 27 l. 6 s. 200', 'Bow.—8 and 9, Cantrell-rd., ut. 60 1/2 yrs., g.r. 7 l., w.r. 70 l. 4 s. 460'

By H. J. BLISS & SONS.

Shepherd's Bush.—Boscombe-rd., i.g.r. 12½, ut. 59½ yrs, g.r. nil	£240
Deptford.—Amers-st., i.g.r. 100. 10s. ut, 60½ yrs, g.r. 1½	150
Balham.—Byrne-rd., i.g.r. 75½, ut. 70 yrs, g.r. 1s.	1,300
Leytonston.—103 and 131, Cann Hall-rd., i.g.r. 63. 14s.	645

By T. B. WESTCOTT.

Hampstead-rd.—69, Stanhope-st., ut. 16½ yrs, g.r. 2½. 7s. w.r. 100. 2s.	150
Camden Town.—40, St. Augustine's-rd., ut. 46 yrs, g.r. 6s. 6r. 50.	525

By STIMSON & SONS.

Southwark.—99 and 101, Redcross-st. (warehouses), i.g.r. 300.	6,000
Redcross-st., i.g.r. 7. 1s., reversion in 7 yrs. 91 and 93, Redcross-st. (s.), i.g.r. 72. 10s.	900
Redcross-st., the "Prince of Wales" b-h and house and shop adjoining, i.g.r. 66. 8s.	850
1 and 2, Disney-st. (lodging house), i.g.r., with goodwill	3,250
12, Marshalsea-rd. (lodging house), i.g.r., with goodwill	950
Camberwell.—76 and 78, Camberwell-rd., i.g.r., and e.g. 110.	2,700
112, 120, and 122, Camberwell-rd. (s.), i.g.r. 192. 10s.	1,680
122A, Camberwell-rd. (factory), i.g.r. 50. 124, Camberwell-rd. (lodging house), i.g.r., with goodwill	3,010
125, 130, and 132, Camberwell-rd. (s.), i.g.r. 150.	700
38, 40, 42, 46, 48, 54, and 56, Camberwell-gr., i.g.r. 27. 4.	7,100
89A, 91, and 93, Camberwell-gr., with stabling, i.g.r. 195.	2,550
95, 97, 99, and 101, Camberwell-gr., i.g.r. 22.	4,210
November 11.—By BOWDITCH & CRANT.	2,200
Addiscombe.—Canning-rd., "Worcester Lodge," i.g.p.	2,750

By P. J. DIXON & SON.

Bethnal Green.—33, Sidney-st., i.g.r. 28. 15s.	1,200
212 and 216, Green-st. (s.), i.g.r. 70. 10s.	305
282, 282A, and 286, Cambridge-rd. (builder's yard, workshops, etc.), ut. 18 yrs, g.r. 70. 10s.	985
264 and 268, Cambridge-rd., ut. 18 yrs, g.r. 46. 10s.	375
7 to 13 (odd), Wadesou-st., ut. 18 yrs, g.r. 22. w.r. 72. 16s.	105
9 and 11, Bishop's-rd., ut. 63 yrs, g.r. 24. 10s.	145
74 and 76, Hare-st. (s.), ut. 8 yrs, g.r. 5. 10s.	605
Hackney.—28 and 28A, North-st., i.g.r. 72. 16s.	140
Horseay Rise.—45, Hanley-rd., i.g.r. 50. 10s.	725
Whitechapel.—17 and 19, Brady-st. (s.), and 1, Windthrop-st., ut. 26½ yrs, g.r. nil, i.g.r. 70.	1,350

By DOLMAN & PEARCE.

Chalk Farm.—31, Oppidans-rd., ut. 60 yrs, g.r. 10. 10s.	410
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By EDWARD WOOD.

Keutish Town.—61, Castle-rd. (s.), ut. 56 yrs, g.r. 6. 10s.	340
Stredtham.—28, Eastwood-st., ut. 97 yrs, g.r. 5. 10s.	200
Battersea.—5, Knox-rd., i.g.r. 31. 4s.	280

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; t. for rent; f. for freehold; e. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gds. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, NOVEMBER 18.

Junior Institution of Engineers (Westminster Palace Hotel).—Mr. William R. Lindley, of Frankfort-on-Maine, will deliver his Presidential Address, on "Municipal Engineering on the Continent." 8 p.m.

Institution of Mechanical Engineers.—Ordinary General Meeting. Mr. A. E. Sexton and Mr. A. Jude on "Impact Tests on the Wrought Steels of Commerce." 8 p.m.

MONDAY, NOVEMBER 21.

Royal Institute of British Architects.—(1) M. L. G. Mouchel on "Monolithic Construction in H. Monique Ferro-concrete." (2) Mr. W. Dunn on "Construction and Strength of Reinforced Concrete." 8 p.m.

London Institution.—Mrs. E. Burton-Brown on "Recent Excavations in the Roman Forum"—Illustrated. 8 p.m.

Liverpool Architectural Society.—Mr. Arnold Mitchell on "The Study of Medieval Work." 6 p.m.

Junior Institution of Engineers.—Visit to Dudley Port and Birmingham to inspect the Central Station of the South Staffordshire Mond Gas Co., and the Nechells Gas Works of the Birmingham Corporation. Train leaves Euston at 9.20 a.m.

TUESDAY, NOVEMBER 22.

Institute of Sanitary Engineers. Ltd. (Lectures in Practical Sanitary Science).—Mr. W. J. Dibdin, F.I.C., on "Sewage Disposal." 7 p.m.

Institution of Civil Engineers.—Mr. J. F. Cleverton Snell on "Distribution of Electrical Energy." 8 p.m.

Northern Architectural Association.—Address by the President, Mr. J. Walton Taylor. 7.30 p.m.

THURSDAY, NOVEMBER 24.

Builders' Benevolent Institution.—Fifty-seventh Annual Dinner (Whitehall Rooms, Hotel Metropole, W.C.). 6.30 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, NOVEMBER 25.

Architectural Association.—Messrs. J. T. Micklethwaite & E. Prieoleau Warren on "Excavations in Westminster." 7.30 p.m.

SATURDAY, NOVEMBER 26.

The Sanitary Institute (Sessional Meeting to be held at the Guildhall, Nottingham).—Discussion, to be opened by Dr. P. Boothby, on "Present-day Aspect of Conservancy Systems." 11 a.m.

TO CORRESPONDENTS.

B. C. (MS. and diagrams received).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject if unsatisfactory. The responsibility of the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Hard Stocks	£ s. d.
1 14 0 per 1000 alongside, in river.	
Bough Stocks and Grizzlies	1 13 0
Faring Stocks	2 12 0
Shippers	2 10 0
Plettons	1 8 0
Bed Wire Cuts	1 14 0
Best Farnham Red	3 12 0
Best Red Pressed Ruabon Facing	5 0 0
Best Blue Pressed Staffordshire	4 4 0
Do. Bulhouse	4 10 0
Best Stourbridge Fire Bricks	4 8 0

GLAZED BRICKS.

Best White and Ivory Glazed Stretchers	13 0 0
Headers	12 0 0
Quoins, Bullnose, and Flats	17 0 0
Double Stretchers	15 0 0
Double Headers	16 0 0
One Side and two Ends	19 0 0
Two Sides and one End	20 0 0
Splays, Chamfered, Squints	20 0 0
Best Dipped Salt Glazed Stretchers, and Header 12	0 0 0
Quoins, Bullnose, and Flats	14 0 0
Double Stretchers	15 0 0
Double Headers	14 0 0
One Side and two Ends	15 0 0
Two Sides and one End	15 0 0
Splays, Chamfered, Squints	14 0 0

White and Dipped Salt Glazed

White and Dipped Salt Glazed	2 0 0
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less than best.

Thames and Pit Sand	7 0 per yard, delivered.
Thames Ballast	6 0
Best Portland Cement	29 0 per ton,
Best Good Blue Lias Lime	20 0

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.

Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

BATH STONE—delivered on road wag-gons, Paddington Depot	1 6½ per ft. cube.
Do. do. delivered on road wag-gons, Nine Elms Depot	1 8½

PORTLAND STONE (20 ft. average).—Brown Whitbed, delivered on road wag-gons, Paddington depot, Nine Elms depot, or Pinlicko Wharf.

White Bussell, delivered on road wag-gons, Paddington depot, Nine Elms depot, or Pinlicko Wharf.	2 1
White Bussell, delivered on road wag-gons, Paddington depot, Nine Elms depot, or Pinlicko Wharf.	2 2½

STONE (continued).

Ancaster in blocks	1 11 per ft. cube, del. rly.
Beer	1 6
Greenhill	1 10
Darley Dale pit blocks	2 4
Red Corschill	2 5
Closeburn Red Freestone	2 0
Bed Mansfield	2 4

YORK STONE.—Best Quality.

Scrapped random blocks 2 10	
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3 per ft. super.
6 in. rubbed two sides ditto, ditto	2 6
3 in. sawn two sides slabs (random sizes) 0 11½	
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½
1½ in. to 2 in. ditto, ditto 0 6	

HARD YORK.—Scrapped random blocks 3 0 per ft. cube, landings to sizes (under 40 ft. super.) 2 8 per ft. super.

6 in. rubbed two sides	3 0
3 in. sawn two sides (slabs random sizes) 1 2	
2 in. self-faced random	0 5
Hopton Wood (Hard Bed) in blocks 2 3 per ft. cube, 6 in. sawn both sides landings 2 7 per ft. cube, 3 in. do. 1 2½	

SLATES.

20 x 10 best blue Bangor	13 2 6 per 1000 of 1200.
20 x 12 " " "	13 7 6
20 x 13 " " first quality	13 0 0
20 x 12 " " "	13 15 0
16 x 8 " " "	7 5 0
20 x 10 best blue Port-	12 12 6
16 x 8 " " madoc	6 12 6
20 x 10 best Eureka green	15 17 6
20 x 12 " " " fading green	18 7 6
18 x 10 " " "	13 5 0
16 x 8 " " "	10 5 0
20 x 10 permanent green	11 12 6
18 x 10 " " "	9 12 6
16 x 8 " " "	6 12 6

TILES.

Best plain red roofing tiles	42 0 per 1000 at rly.
Hip and Valley tiles	3 7 per doz.
Best Brosely tiles	33 0 per 1000
Do. Ornamental tiles	52 6
Hip and Valley tiles	4 0 per doz.
Best Eubon red, brown, or best (Edwards)	57 6 per 1000
Do. Ornamental do	60 0
Hip tiles	4 0 per doz.
Valley tiles	3 0
Best Red or Mottled Staffordshire do. (Peaks)	51 9 per 1000
Do. Ornamental do	54 6
Hip tiles	4 1 per doz.
Valley tiles	3 8
Best "Horseshoe" brand plain tiles	48 0 per 1000
Best Ornamental tiles	50 0
Hip tiles	4 0 per doz.
Valley tiles	3 8
Best "Hartshill" brand plain tiles, sand faced	50 0 per 1000
Do. pressed	47 6
Do. Ornamental do	50 0
Hip tiles	4 0 per doz.
Valley tiles	3 6

WOOD.

Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15 10 0
Deals: best 3 by 4	14 10 0
Battens: best 2½ in. by 7 in. and 3 in. by 7 in. and 3 in. by 8 in.	11 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0

Deals: seconds 1 0 0 less than
Battens: seconds 0 10 0
2 in. by 4 in. and 2 in. by 6 in. 9 0 0
2 in. by 4½ in. and 2 in. by 5 in. 8 10 0

Foreign Sawm Boards—
1 in. and 1½ in. by 7 in. 0 10 0 less than
3 in. 1 0 0

Fir timber: best middle Danzig or Memel (average specification) 4 10 0
Seconds 4 5 0
Small timber (8 in. to 10 in.) 3 12 6
Small timber (6 in. to 8 in.) 3 0 0
Swedish timber (3 in. to 4 in.) 2 15 0
Pitch-pine timber (30 ft. average) 3 5 0

JOINERS' WOOD. At per stan

White Sea: first yellow deals, 3 in. by 11 in.	23 0 0
3 in. by 9 in.	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0
Secord yellow deals, 3 in. by 11 in.	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0
Do. 3 in. by 9 in.	18 0 0
Battens.....	13 10 0

WOOD (continued).

Table listing various wood products such as 'Timber Wood (continued)', 'Oak Logs', 'Walnut', 'Mahogany', 'White Pine', 'Fir', 'Spruce', 'Larch', 'Sawn Timber', etc., with prices per standard unit.

JOISTS, GIRDERS, &c.

Table listing joists and girders including 'Steel Joists, ordinary', 'Compound Girders, ordinary', 'Timber Joists', etc., with prices per ton.

METALS.

Table listing various metal products including 'Common Bars', 'Galvanized Iron', 'Sheet Steel', 'Soft Steel', 'Cast Iron', etc., with prices per ton.

LEAD, &c.

Table listing lead products such as 'Sheet, English, 3lb. and up', 'Cast Lead', 'Lead Pipe', etc., with prices per ton.

ENGLISH SHEET GLASS IN CRATES.

Table listing English sheet glass in crates including '15 oz. thirds', '21 oz. thirds', '26 oz. thirds', etc., with prices per ft. delivered.

OILS, &c.

Table listing various oils such as 'Raw Lined Oil in pipes', 'Red Lead', 'Boiled', 'Turpentine', etc., with prices per gallon.

VARNISHES, &c.

Table listing various varnishes including 'Fine Pale Oak Varnish', 'Superior Pale', 'White Copal Enamel', etc., with prices per gallon.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 10s. per annum (62 numbers) FRISTADY.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays.

ARDEE (Ireland).—For alterations at the Workhouse, for the Guardians. Mr. L. Turley, C.E., architect, 17, Leeson-street, Drogheda.

ASHBORNE.—For a 12-inch borehole at waterworks for a depth of 100ft., for the Urban District Council.

ASHWICK (near Chippenham).—For new drainage scheme. Mr. T. J. Moss-Flower, C.E., engineer, Carlton-chambers, Bristol, and Victoria-street, Westminster, S.W.

BRIDGE (near Canterbury).—For alterations to the kitchen, boiler house, and laundry at the Workhouse, for the Guardians of Bridge Union. Mr. A. Bromley, architect, Radnor-chambers, Folskote.

BRIDGEWATER.—For new sewer and branch drains to houses in the President-place for the Town Council. Mr. F. Parr, Borough Surveyor. Quantities by Borough Surveyor.

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BRISTOL.—For reconstructing the sanitary arrangements and other work at Cotham, Bristol, for Mr. R. Neilson. Mr. T. J. Moss-Flower, C.E., engineer and surveyor, Carlton-chambers, Bristol, and 2, Victoria-mansions, Westminster, S.W.

BUSHEY (Herts).—For constructing a small continuous filter at the disposal works in Hamper Mill-lane, for the Watford Rural District Council. Mr. E. Layley, engineer, 9, Market-street, Watford.

CHEW MAGNA.—For repairing, etc., church, for the Committee for the Cleaning and Repairing the Parish Church.

CORK.—For rebuilding the engine and pump house, and building additions, etc., to boiler house at pumping station, Lee-road, for the Town Council. Mr. J. F. Delany, City Engineer. Quantities by Engineer.

COULSDON (Surrey).—For forming new road at Southam-bottom-lane.

COWPEN.—For making Princess Louise-road, for the Urban District Council. Mr. R. Grieves, Surveyor, Cowpen.

CROFTON.—For paving channels at Crofton, for the Cowpen Urban District Council. Mr. R. Grieves, Surveyor to Council, Cowpen.

EASTLEIGH (Hants).—For alterations and additions to Drill Hall, Desborough-road. Messrs. Lemon & Bizard, architects, Lansdowne House, Castle-lane, Southampton.

FISHPONDS (Bristol).—For builder's work at new works for the Avice Engineering Company.

GREAT BERKHAMSTED.—For erecting new school for girls in Prince Edward-street, for the Managers of the Maintained Schools. Messrs. C. H. and N. A. Rew, architects, 125, High-street, Great Berkhamsted. Quantities by architects.

GRIMSBY.—For extension of Corporation water-works (Contract No. 2). Mr. H. Gilbert Whyatt, A.M.I.C.E., Borough Engineer and Surveyor.

HOUNSLOW.—For paving works, Hounslow and Isleworth, for the Heston and Isleworth Urban District Council. Mr. P. G. Parkman, Surveyor, Town Hall, Hounslow, W.

KENDAL.—For sewerage works, for the Corporation. Mr. R. Hampton Chace, C.E., Borough Engineer, Town Hall, Kendal. Quantities by Engineer.

LONDON.—For new banking premises, Mare-street. Mr. W. W. Barnham, architect.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designa- be Delive
*New Police and Fire Brigade Stations	City & County of Bristol Watch Com.	Not stated	No date
Wesleyan Chapel and School, Harehill's-lane, Leeds	.....	Send names to Rev. N. J. Willis, Richmond-hill, Leeds	do.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders be Deliv
Classroom, Moortown Council School	Leeds Education Committee	W. S. Braithwaite, Architect, Education Office, Leeds	Nov. 1
Alterations to Canton Liberal Institute	.....	Secretary, 301, Cowbridge-road, Canton, Cardiff	do.
Stores	Tyne Improvement Commission	Engineer to Commissioners, Bewick-street, Newcastle-on-Tyne	do.
Repairs, etc., at South End Provident School, Bland	Education Com. West Riding C.C.	J. Vickers-Edwards, County Architect, County Hall, Wakefield	Nov. 1
Public Baths, Selby Oak	Solihull R.D.C.	A. E. Curall, Surveyor, The Square, Solihull	do.
700 Tons of Granite Setts	Tynemouth Corporation	J. F. Smilie, Borough Surveyor, Tynemouth	do.
750 yds. of Channel Blocks	do.	do.	do.
75 Shalve Valve Hydrants, etc.	Beckenham U.D.C.	J. A. Angell, Surveyor, Beckenham	do.
Public Baths, Selby Oak	King's Norton & Northfield U.D.C.	A. W. Cross, Engineer, 23, Valentine-road, King's Heath	do.
Rebuilding Colliers' Arms Hotel, Nantyllydon	Rhondda Valley Breweries Co.	Collier's Arms, Maesteg	do.
Work at Cottage Homes, Brynecoch	Neath Guardians	D. M. Davies, Architect, Orchard-place, Neath	do.
Machine Tools	Sewport (Mon.) Corporation	Borough Electrical Engineer, Town Hall, Newport, Mon.	do.
Frame-way Rail Bonds	Manchester Tramways Committee	J. M. M'Elroy, Manager, Tramways Dept., 55, Piccadilly, Manchester	do.
Painting at Workhouse, Brownlow-hill	Liverpool Select Vestry	Parish Offices, Liverpool	do.
Additions, Welbeck-road Council School, St. Anthony's	Newcastle-on-Tyne Education Com.	J. W. Thompson, Architect, 63, Grey-street, Newcastle-on-Tyne	do.
Tenements, Gray-street, Perth	Mr. J. Craik	A. G. Chalmers, Architect, Perth	do.
Renovations, Repairs, etc., Bradisloe Hall, Norfolk	Mr. E. Morse	A. Pells, F.S.I., Architect, Beccles	do.
Movable Screen, etc., Infants' School, Albert-street	Bridgwater Education Committee	Borough Surveyor, Municipal Buildings, High-street, Bridgwater	Nov. 2
Wrought Iron Tubes and Fittings	Wilmslow & Alderley Edge Gas Co.	W. Severs, Engineer, Gasworks, Wilmslow	do.
Sewage Works, Haydon Bridge	Hexham R.D.C.	J. H. Nicholson, Clerk, Midland Bank-chambers, Hexham	do.
Roadworks, Hindon-road	Latherhead U.D.C.	T. Salkield, Surveyor, Council Offices, Leatherhead	do.
Electric Lighting Contract V. Piping	Deptford Borough Council	F. H. Medhurst & Lloyd, Engrs., 13, Victoria-st., Westminster, S.W.	do.
Making-up Frederick-street and Cowood-street	Swinton U.D.C.	R. Fowler, Surveyor, Council Offices, Swinton, near Rotherham	do.
Reconstruction of Two Tenements, Greenside	Edinburgh City Council	Clerk of Works at Hospital, Serpentine-road	do.
70 lineal yards of 9-in. Sewer at Dinas	Rhondda U.D.C.	W. J. Jones, Engineer, Public Offices, Ponty, Rhondda	do.
Twenty Cottages at Chopwell	Consett Iron Co.	C. E. Oliver, Architect, Consett	do.
Twelve Cottages at Leadgate	do.	do.	do.
Timber for Hall Show	Yorkshire Agricultural Society	J. Maughan, Secretary, Blake-street, York	do.
600 yds. of Stoneware Sewer, etc.	Colwall Parochial Committee	T. G. Caink, Engineer, 95, High-street, Worcester	do.
800 yds. super. of Cement Concrete Paving Flags	Sheerness U.D.C.	V. H. Strlton, Clerk, Council Offices, Trinity-road, Sheerness	do.
Additions, etc., to House, Goxhill, Lincs.	Birmingham Public Works Com.	Mr. E. Goodhand, Architect, Osborne-chambers, Grimsby	Nov. 2
Wellington-street Storm-water Sewer	Fulwood U.D.C.	J. Price, City Engineer, Council House, Birmingham	do.
Sewerage Extension (Contract No. 4)	Inverness-shire County Council	Chief Staff Officer, Headquarters, Scottish District, Edinburgh	do.
Mineral and Culca Oil in Scottish Districts	do.	R. R. Black, Engineer, 22, Union-street, Inverness	do.
17 1/2 Tons of C.I. Pipes, Valves, etc., Glen-Urquhart	do.	do.	do.
4 1/2 Miles of Pipe Track Work	East Indian Railway Co.	C. W. Young, Secretary, Nicholson-lane, London, E.C.	do.
Deck Bridges (40-ft. Spans)	Manchester Improvement, etc., Com.	City Surveyor's Office, Town Hall, Manchester	do.
River Crossing at Clayton, New-road	Blackpool Highway Committee	T. Houston, Architect, Kingscourt, Wellington-place, Belfast	do.
Four Houses, Villa-road, Donaghadee	West Hartlepool Hospital	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Tar Asphalted Promenade Widening Works	Mr. J. Murray	Clerk of Works at Hospital, Serpentine-road	do.
Boundary Wall, etc., Cameron Memorial Hospital	do.	T. H. Murray, Architect & Surveyor, Consett, Durham	do.
House, Albert-road, Consett	West Ham Guardians	do.	do.
Stable and Warehouse, Nile-street, Consett	Manchester Parks Committee	Clerk's Office, Union Workhouse, Leytonstone, N.E.	Nov. 2
*Supply of Brick Burrs	Commissioners of Irish Lights	City Architect, Town Hall, Manchester	do.
Six Rustic Shelters, Heaton Park	London C.C.	O. Armstrong, Secretary, Irish Lights Office, Dublin	do.
White Lead, Store Premises, Kings-town, co. Dublin	do.	M. Fitzmaurice, Engineer, County Hall, Spring Gardens, S.W.	do.
Removal of Ashes, etc., Abbey Mills Pumping Station	Haekney Borough Council	do.	do.
Removal of Ashes, etc., Albert-road, N. Woolwich	West Ham Guardians	Norman Scorgie, Borough Engineer, Town Hall, Hackney, N.E.	do.
Asphalte Paving Works, London Fields	Merthyr Tydfil Guardians	T. Roderick, Architect, Aberdeen and Merthyr	Nov. 2
*Iron Coal Bunker at Whipps Cross-road Infirmary	Hull Corporation	City Engineer, Town Hall, Hull	do.
Fire-escape Staircases at Workhouse	do.	do.	do.
Scavenging and Watering	do.	do.	do.
Cartage	Co-operative Society, Ltd.	H. B. Buckley, Architect, 85, Commercial-street, Batley	do.
Materials, etc.	Admiralty	Works Department, Admiralty, 21, Northumberland-avenue, W.C.	do.
Six Terrace Houses, Dehobona, Bexley	do.	do.	do.
*New Coastguard Building at Peel, Isle of Man	Maldens and Coombe U.D.C.	T. B. Simmons, C.E., Council Offices, Cambridge-rd., New Malden	Nov. 2
*New Coastguard Building at St. Peters, Lincoln	Kent C.C.	County Surveyor, Maidstone	do.
*New Coastguard Building at Ingoldmells, Lincoln	Leith Corporation	T. B. Laing, Town Clerk, Council-chambers, Leith	do.
Making-up Rho-v-road, etc.	do.	do.	do.
Steam Rollers and Scarifiers, etc.	Wakefield R.D.C.	F. Massie, Architect, Tetley House, Kirkgate, Wakefield	do.
Tramway Rails, etc.	do.	do.	do.
Tramway Cars	Felling U.D.C.	Surveyor, Council-buildings, Felling, R.S.O., Durham	do.
Main Pipe Sewer at Walton	do.	do.	do.
Main Pipe Sewer at Alversthorpe	Edinburgh City Council	Public Works Office, City-chambers, Edinburgh	do.
Cartage	Warrington Corporation	Garlick & Sykes, Engineers, 22, Birley-street, Blackpool	Nov. 2
Fencing at Soughton Park	Elgin County Council	Borough Surveyor, Town Hall, Warrington	do.
Steel Water-chute, South Shore, Blackpool	Exmouth District Council	A. Hogg, County Road Surveyor, 24, Academy-street, Elgin	do.
Urinals, Closets, etc., for New Conveniences	Gowes U.D.C.	S. Hulton, Surveyor, District Council Offices, Exmouth	do.
Road Metal for One Year	Great Northern Railway Co.	J. W. Webster, Surveyor to the Council	do.
Wrought Iron Railings and Gates, Espanade Gardens	West Hartlepool Corporation	Stores Superintendent, Doncaster	do.
Guernsey Granite, Town Quay, Cowes, Isle of Wight	Aldershot U.D.C.	F. F. Dennis, Borough Engineer, West Hartlepool	Nov. 2
Painting Twenty Cottages, Mozart-street	West Ham Corporation	N. F. Stooke, Clerk, Town Hall, Aldershot	do.
Laying-out Pleasure Grounds, Grosvenor-road	Leeds Corporation	Borough Engineer, Town Hall, West Ham, E.	do.
Underground Sanitary Conveniences, Plinlastow	Leeds Corporation	City Engineer's Office	do.
Painting, etc., Hunslet Baths	Great Western Railway Co.	Engineer at Neath Station	do.
Alterations, etc., to Station Buildings, Penilly	do.	do.	do.
Cottage at Penilly	do.	do.	do.
1 1/2 Miles of Railway, Garmant, South Wales	Mr. W. Dalgleish	Engineer, Paddington Station, London	do.
*Roads Shed, Avonmouth, near Bristol	Committee of Management	The Company's Engineer, Bristol Station	do.
House, Grange-over-Sands	Altrincham U.D.C.	Satell & Brundrit, Architects & Surveyors, Ulverston	do.
Colour, Paint, etc., Royal Bath Hos., etc., Harrogate	Staffordshire Potteries Waterworks Co.	At Hospital	Nov. 2
Cottages on Hale Moss	Hove Town Council	G. D. Harrison, Engineer, Albion-street, Hanley	do.
Excavate 2 1/2 Miles of Trench for 18-in. Sewer from Pipes	Borough of Hove	E. H. Scott, Borough Surveyor, Town Hall, Hove	do.
3,000 ft. lines of Granite Kerbing	King's Norton, etc., U.D.C.	do.	do.
*Granite Kerbing and Channelling	Mr. C. Frith-Hudson, J.P.	A. W. Cross, Surveyor, 23, Valentine-road, King's Heath	do.
Street Works, King's Heath and Selby Wick	Commissioners of Irish Lights	S. Shaw, F.R.I.B.A., Kendal	do.
Alterations, etc., Wharfedale Hotel, Beetham	do.	O. Armstrong, Secretary, Irish Lights Office, Dublin	Dec.
28,000 gallons of Heavy Mineral Oil	Stamford Guardians	do.	do.
30,000 gallons of Mineral Oil	Admiralty	Mr. Ward, Architect, Stamford	do.
Children's Homes, Ryhall-road	Thames Conservators	Director of Works Depart., 21, Northumberland-avenue, W.C.	Dec.
*New House at Greenock	Alderley Edge U.D.C.	Conservators' Office, Victoria Embankment, E.C.	Dec.
Stores	South Hetton Coal Co., Ltd.	J. Newton, Son, & Bailey, Engineer, 17, Cooper-st., Manchester	Dec.
Sewage Disposal Works	Romford R.D.C.	J. R. Lambert, South Hetton, Sunderland	do.
Colliery Stores	do.	G. P. Wood, Highway Surveyor, Victoria-road, Romford	do.
Norway Granite Kerb, Hornchurch	do.	do.	do.
320 ft. of Kerbing, Cranham	do.	do.	do.
2,300 ft. of Kerbing, Clock House-road, Upminster	do.	do.	do.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be Delivered. Includes entries for storage reservoir, bridge, water tower, engine house, etc.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be In. Includes entries for Southampton County Council and Civil Service Commission.

Those marked with an asterisk (*) are advertised in this number. Competitions, iv. Contracts, iv. vi. viii. x. Public Appointments, xvii.

TENDERS.—Continued from page 533. LONDON.—For repairing roads and repairing faring at the Northern (Convalescent) Fever Hospital, Richmond-hill, N., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief.— Northern Hospital—Road-making and other works. Watnright & Ballard, Ltd., £777 0 0. Co., £1,290 10 0. Grouds & New-tenham*, £470 0 0. Northern Hospital—Repairs to tar-paving. Watnright & Ballard, Ltd., £235 0 0. Grouds & New-tenham*, £235 0 0. J. Smart & Son*, £234 17 0. Constable, Hart, & Co., Ltd., £158 0 0. Vickers & Field, £306 0 0. 25, Victoria-st., W. Sheppard, £306 0 0. Wm'str., S.W.* £139 10 0. LONDON.—For making-up Loxwood and Radley, for the Tottenham Urban District Council. Mr. H. Prescott, Engineer, Coombes Croft House, 712, -road, Tottenham:— Radley-road, Loxwood-road. Adams, £501 8 9. £423 4 11. Rowley, jun., £487 4 11. £406 17 9. G. G. G. & Newton, £481 5 0. £396 9 6. Frost Bros., £469 7 4. £386 4 8. Bloomfield, £441 0 6. £386 4 8. Bloomfield, £421 1 2. £344 11 0. Bloomfield, Tottenham*, £375 13 4. £302 11 4.

Fulham, Eberington-street. W. Hornett, £239 10 0. F. Chidley & Co. £232 7 0. C. F. Keadley, £297 0 0. W. R. & A. Hide, £230 5 0. G. Neal, £285 0 0. General Builders. F. G. Minter, £252 0 0. L.L.L., Wharf-road, Notting-ham. W. Hammond, £243 0 0. Hill*, £193 0 0. F. T. Chichen & Co., £238 15 0. Hackney (Central), Queen's-road. W. Shurmar & Sons, £432 0 0. Barrett & Power, £299 0 0. W. Silk & Son, £389 0 0. J. Stewart, £275 10 0. McCormick & Sons, £370 0 0. F. Bull, £269 0 0. A. J. Sheffield, £310 0 0. 22, Rockmead-road, Hackney*, £236 10 0. C. Willmott & Son, £297 5 0. Islington, E., Blackstock-road. T. Cruys, £310 0 0. F. W. Harris & Co., £225 0 0. Patman & Fotherings, Ltd., £225 0 0. ham, Ltd., £275 0 0. J. Grover & Son, £224 0 0. McCormick & Sons, £272 0 0. Marchant & Hirst, £218 0 0. G. Kirby, £248 0 0. 136, Highgate-rd.* £218 0 0. A. Porter, £243 0 0. Lewisham, Haseltine-road. H. Loney & Son, £325 0 0. E. P. Bulled & W. J. Howie, £325 0 0. Co., £229 0 0. C. G. Jones, £285 0 0. J. & C. Bowyer, W. Banks, £254 12 6. Westow st., G. J. Corrad, £250 0 0. Upper Nor-wich*, £219 0 0. Marylebone, W., Bell-street. Thompson & Beveridge, £244 0 0. Bristol & Eatwell, £187 0 0. G. Foxley, £241 15 0. F. T. Chichen & Co., £184 0 0. G. Neal, £185 0 0. F. Chidley & Co., £175 0 0. W. Deusham & Sons, £189 0 0. W. Chappell, £243, Elgin-avenue*, £160 0 0. Peckham, Redden's-road. H. J. Williams, £342 10 0. J. Greenwood, W. Sayer & Son, £245 0 0. Ltd., £169 0 0. W. J. Howie, £214 0 0. J. & C. Bowyer, £169 0 0. E. P. Bulled & Co., £175 0 0. J. Garrett & Son, £169 0 0. Maxwell Bros., £175 0 0. 17, Balham-hill 153 0 0. Ltd., £175 0 0. Rotherhithe, Farncombe-street. W. Sayer & Son, £308 0 0. Rice & Son, £249 0 0. E. Triggs, £273 0 0. J. Garrett & Son, £217 0 0. J. Greenwood, Ltd., £252 0 0. H. Groves, Slack-well-st., Green-wich*, £225 0 0. W. Banks, £249 10 0. Walworth, Victory-place. W. Hornett, £207 0 0. J. E. Ford, £197 0 0. T. L. Green, £295 0 0. J. Appleby & Sons, £294 0 0. Grovall Works, W. Sayer & Son, £211 0 0. Lambeth*, £184 0 0. Maxwell Bros., Ltd., £209 0 0. Wandsworth, Sunfield-road. Hudson Bros., £345 0 0. R. S. Ronald, £280 0 0. E. A. Jewell, £314 0 0. Lathby Bros., £259 0 0. J. & M. Patrick, £313 0 0. Gorwall Works, W. & C. Brown, £295 0 0. Chase, Clapham*, £241 0 0. W. Johnson & Co., Ltd., £269 0 0. Woolwich, Conway-road. Enness Bros., £279 0 0 0. W. J. Howie, £180 0 0 0. Holliday & Greenwood, £184 0 0 0. Ltd., £235 0 0 0. H. Groves, £22 0 0. W. Hayter & Son, £209 10 0 0. S. 328, High-street, Plum-stead*, £172 0 0 0. W. Banks, £189 12 6 6.

LONDON.—For proposed farrier's shop. Peckham Rye, S.E., for Messrs. Tilling, Ltd. Mr. W. Leonard Dowton, architect, City Bank-chambers, Bedford-row, W.C.:- B. W. Sheffield, £460. Batley, Sons, £380. C. Ansell, £424. Holness, £380. W. T. Champion, £424. G. Parker, £375. [All contractors are local men.] NEWARK.—For erecting a mission hall and additions to schools, Barnby-road. Messrs. Sheppard & Harrison, architects, Bargate, Newark:- W. Smith, £589 10 0. F. Crossan, £529 0 0. H. Hart, £335 0 0. G. Brown & Sons, £509 0 0. G. Henderson, £34 19 0. C. Baines*, £45 0 0. [All of Newark.] OMAGH (Ireland).—For alterations to old chapel at the Omagh District Asylum, for the Joint Committee of Management. Messrs. Doolin, Butler, & Donnelly, architects, Dawson-chambers, Dawson-street, Dublin:- J. Robinson, Omagh, £525. PENRHIWCEIBER.—For constructing 9-in. pipe sewer and lines on the Pontyfa Isaf Estate. Mr. P. E. Hill, surveyor, 23, St. Mary-street, Cardiff:- E. Lewis, £169 0 0. Webb & Son, £125 14 0. J. Sutherland, £128 6 3. Osmond & Sons, £123 1 6. PENZANCE.—For alterations and additions to two shops at 35, Causeway-head, for Mr. B. Downing. Mr. H. Maddern, architect, 13, Clarcoc-street, Penzance:- G. H. Davis, £386 0 0. R. Hosking, £328 12 0. J. Nicholas, £376 3 0. Masonry Only. J. Richards, Barwis Hill*, £156 9. Carpenter and Painter. J. Berryman, Heamoor*, £163 8 0. PUDSEY.—For sewerage works, Contract No. 23, at Fuleac, for the Corporation. Mr. J. Jones, Borough Surveyor, Church-lane, Pudsey. Quantities by the Borough Surveyor:- Harold Arnold & Son, Building and Engineering Contractors, Leeds and Doncaster, £1,015. SOUTHALL.—For making-up part of Avenue-road, for the Urban District Council of Southall-Norwood. Mr. R. Brown, Engineer and Surveyor, Public Offices, Kavanagh, £909 4 9. Mowlem & Co., £736 0 0. H. Morecroft, £898 0 0. T. Watson, £715 5 6. Harvey Bros., £668 2 0. T. Fred & Sons, £711 3 6. Thacker, £804 8 0. A. & D. Hanson, £745 17 6. Southall, £700 0 0. P. S. Gibbons, £734. [Surveyor's estimate, £734.] SOUTHALL.—For erecting porter's lodge at the Sanatorium, North-road, for the Urban District Council of Southall-Norwood. Mr. R. Brown, Engineer and Surveyor, Public Offices, Southall:- Ferguson & Co., £448 19 4. B. Hanson, £533 0 0. W. J. Dickens, £430 0 0. Booth, Southall*, £335 10 0. Samuel Matier, Surveyor, £425 0 0. [Surveyor's estimate, £335.] SURBITON.—For 250 yds. of 12-in. and 9-in. storm-water drains, etc., and taking out old portion of drain, Brighton-road, for the Urban District Council. Mr. Samuel Matier, Surveyor:- S. Hoffman, £300 10 0. W. J. Logan, £192 0 0. F. Atkins, £298 0 0. F. Foots Cray*, £192 0 0. Kavanagh & Co., £285 16 3.

TWICKENHAM.—For street works, Cresswell, Denton, and Orchard roads, and Waldegrave-gardens, for the Urban District Council. Mr. F. W. Pearce, Surveyor, Town Hall, Twickenham:—

	Cresswell-road.	Denton-road.	Orchard-road.	Waldegrave-gardens.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
F. Hoffmann	627 15 0	250 15 0	833 0 0	566 13 0
H. Bentham	550 0 0	214 0 0	805 0 0	579 0 0
J. Howell & Co.	769 5 0	309 0 0	793 17 4	517 0 0
Harvey Bros.	416 12 7	235 15 5	718 3 8	491 17 8
F. Thacker	524 0 0	208 0 0	690 0 0	465 0 0
S. Kavanagh & Co.	592 0 0	223 0 0	688 0 0	510 0 0
T. Watson, jun.	509 15 0	197 10 0	674 4 3	505 8 7
T. Adams	538 0 0	209 0 0	609 0 0	539 0 0
J. Mowlem & Co.	512 0 0	195 0 0	574 0 0	477 0 0*
W. H. Wheeler	478 16 10	201 4 10	629 8 6	483 0 0
G. Wimpey & Co.	499 0 0*	191 0 0*	495 0 0*	495 0 0
Surveyor's estimate	539 4 5	208 18 4	766 11 4	516 10 5

* Not in accordance with amended specification.

SOUTHAMPTON.—For alterations and additions to the Headquarters, Drill Hall, St. Mary's-road, Southampton, for the 1st Hampshire Royal Garrison Artillery Volunteers (Lieut.-Col. J. H. Harrison Hogue, Officer Commanding). Messrs. Lemon & Blizard, architects, Lansdowne House, Castle-lane, Southampton. Quantities by Mr. J. Henry Blizard, A.M.I.A.S.T.C.E., etc.:—

Rashley & Sons	£2,188 0 0	H. J. Hood ..	£1,950 0 0
J. Treherne	2,127 0 0	Baeshaw & Sons	1,949 0 0
T. J. Jukes	2,017 0 0	Wort & Way ..	1,931 4 6
H. Stevens & Co.	2,055 0 0	T. H. Stiles ..	1,924 0 0
Dyer & Sons	2,045 0 0	G. R. Long ..	1,923 0 0
Jenkins & Sons	1,967 0 0	W. Jupp	1,769 15 3
Architects'	£2,100	S'thamptn*	1,769 15 3

SWANAGE.—For constructing a retaining wall (second section) along the Shore-road, for the Urban District Council. Mr. J. Sidney, Senior Surveyor to the Swanage Urban District Council:—

J. A. Bartlett	£2,298 0 0	Bert & Burt, Swanage ..	£1,977 4 2
P. H. Parsons & T. Clark	2,085 0 0	F. Farsous ..	1,820 0 0
J. T. Whettam, jun.	2,667 0 0		

* Withdrawn.

TOTTENHAM.—For making-up Chalgrove-road (second section), Fawley and Lordsmead roads, for the Urban District Council. Mr. W. H. Prescott, Engineer, Coombes Croft House, 712, High-road, Tottenham:—

	Chalgrove-road (2nd portion).	Fawley-road.	Lordsmead-road.
	£ s. d.	£ s. d.	£ s. d.
T. W. Pedrette	445 10 0	1035 11 10	
E. T. Bloomfield, Tottenham	237 17 4	299 4 2	*649 2 10
Grounds & New-fon	241 16 0	353 8 6	750 8 2
T. Adams	246 19 1	343 18 3	717 19 8
C. Bloomfield, Tottenham	*233 8 0	*202 10 0	734 18 8
Harvey Bros.	316 14 10	457 0 3	862 10 1

TROEDY RHIV.—For renovation and enlargement of the English Wesleyan Church, for the Trustees. Mr. L. G. Tiley, architect:—

W. Spratt, Tony Pandy	£450
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WATFORD.—For pipes for water mains, for the Urban District Council. Mr. David Waterhouse, Council's Surveyor:—

J. Blakeborough & Sons, Brighouse, ..	£785 6 7
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WELLINGBOROUGH.—For erecting a corn exchange, offices, refreshment-rooms, etc., for the Urban District Council. Mr. J. M. Sharnan, architect, Market-square, Wellingborough:—

Goodman & Murkett, Wellingborough ..	£5,100
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WELLINGBOROUGH.—For providing and fixing cattle pens at new markets, for the Urban District Council. Mr. J. M. Sharnan, architect, Market-square, Wellingborough:—

Cort, Paul, & Cornick, Leicester	£1,135
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WELLINGBOROUGH.—For levelling, draining, and paving site for cattle market, for the Urban District Council. Mr. J. M. Sharnan, architect, Market-square, Wellingborough:—

Goodman & Murkett, Wellingborough ..	£1,500
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Architects' Drawings.



CASE, fully reported in our last issue, in which an architect was compelled by the Court to hand over his drawings and specification to his client, furnishes the latest instance of the application of the ill-starred precedent of "Ebdy v. M'Gowan," which for the present is held by judges to decide the law as to the ownership of an architect's drawings, and to compel him, contrary to reason, equity, and commonsense, to hand them over to his client if the client demands them. In the case referred to the learned judge refused even to listen to the evidence of architects who were there as witnesses to support the defendant's claim. And of course, according to our wonderful system of English law, whereby a case is decided not on the consideration of its own merits but on the consideration of what was the ruling of some other judge in some previous case—inasmuch that, as an eminent judge declared on a celebrated occasion, "he did not sit to administer justice but to administer the law"—a judge will naturally hold that he has no other course than to give a judgment according to the existing precedent. If, however, the judge in this case had had the whole argument before him—if he had been willing to hear what the witnesses for the defence had to say—he might have realised, what lawyers in

general do not seem to be aware of, that "Ebdy v. M'Gowan" only covers one half of the field; that it was not on all-fours with the case he was trying, and therefore was not rightly applicable as a precedent. "Ebdy v. M'Gowan" was one of those cases in which the building was not carried out; only the drawings were made. Professional custom in such a case has undoubtedly sanctioned the handing over the drawings to the client, on the ground apparently that otherwise the client gets nothing for his money. Admitting that for the moment (we will return to the point just now), it is equally certain that professional custom is that in the ordinary case, where a building has been carried out from an architect's drawings, the drawings are retained by the architect. It is very seldom indeed that they are even asked for by the client; the case heard last week is quite exceptional. If the witnesses for the defence had been heard, this professional custom would have been established; and the law, to do it justice, has generally attached some weight to evidence of professional custom. But the judge refused to hear any evidence, and thereby lost the opportunity of supplying a new precedent from his own ruling, in a case which, as we have pointed out, is different in its circumstances from that of Ebdy v. M'Gowan. "This was looked for at his hand, and this was banked."

The whole difficulty arises from the fact that judges and lawyers generally apparently cannot be got to understand what an architect is and what he is really

paid for. He is *not* paid for making drawings; drawings are not architecture; he is paid for devising and carrying out a building, and, in cases where the building is not merely utilitarian, for producing artistic expression in architectural form. He cannot, like a sculptor, produce his work with his own hands; a building has to be carried out by many hands; and his drawings are the means of conveying his idea to the minds of those who are to carry it out. In principle, the client has nothing whatever to do with them; they are simply the architect's tools. There are even circumstances in which they may be dispensed with altogether. Pugin used in some instances to carry out a church without any formal drawings; he always employed the same builder, who understood his slight sketches. There are architects who hardly make any details in the office; who sketch them on a board or on a wall at the building. There are other architects, very clever men too, who affirm that the production of designs by drawings has taken the life out of architecture. We do not agree with them, or at least we say that their position is an impossible one for the present day, because the intricate requirements of large modern buildings cannot be adequately provided without considering them on a carefully drawn-out plan first. But the fact that there are able architects who hold this view should go to show, at least, that drawings are not really what an architect is engaged for. The lawyers have got hold of the subject entirely the wrong end first, but apparently nothing will

persuade them of it. In conversation with a solicitor in regard to this very case, we said, as an illustration, that you might just as well demand of a sculptor who had been commissioned to produce a statue, that he should hand over also whatever models or clay sketches he had made in the process of working out his conception. But the illustration was thrown away; our legal friend replied that if such a question came into court, he would probably have to give them up. Of course, after that, argument is useless. People who can say such a thing do not understand what art is, nor what is the position of an artist. But if such a judgment as that would not impossibly be given in an English court of law, we are well assured of one thing—it would never be given in a French court. In France the position and rights of the artist would be understood; in England they are not.

Apart from the illogical view of an architect's function which is taken by the law, the injury to him in demanding the handing over of his drawings is or may be a very grave and serious one. He has no guarantee that his ideas, which are represented by his drawings, will not be handed over in turn to another and perhaps quite inferior architect to make use of, or be made use of by the client himself to act as his own architect in carrying out other buildings. It leaves him, as the defendant's counsel truly said, "in a perfectly hopeless position; and if he is attacked at any time he is unable to protect himself." The same with the specification. The specification for a large building is a document summing up a great deal of special experience and special knowledge. The client pays for the application of that experience and knowledge in carrying out the particular building which he wishes to have erected, but for nothing more; he does not pay for having that experience and knowledge put into his own hands in perpetuity, to make what use he likes of it.

There is no doubt, however, that the difficulty and misunderstanding has been increased, to lawyers, by the custom which has been tacitly admitted by the profession in general, of giving up the drawings when the building is not carried out. As we said, that has no doubt been acquiesced in from a feeling that if plans and specification are supposed to represent half the architect's usual charge of 5 per cent. on the cost of the whole building, the client must have something for his money when the building is not carried out. In our opinion, the architectural profession has made a great mistake in admitting that custom. The client, as we said, comes to the architect to carry out a building, not (essentially) to make drawings of it. If, having given an architect a commission to carry out a building, he changes his mind, it is his own fault for not knowing his own mind. The reasonable and logical position for the architect to take up would be to say—"I have expended a great deal of time and thought in preparing the drawings for this building, which you have now abandoned; you must pay a reasonable charge for having wasted my time and

thought to no purpose." The charge in that case need not necessarily be the orthodox 2½ per cent. which is supposed to represent drawings and specification; it would be a charge based on circumstances, on the estimated value of the time and thought wasted; and even if the architect got rather less than what is usually charged for a building that is abandoned, his position would be a far better as well as a more logical one. He would at all events not be giving away the work of his brain at half-price for the client to make what use he pleased of it, which is the situation at present. And on the same grounds, if a man came to an architect and said "I want plans and designs of a building of such a nature" (describing its character and purpose) "but I do not mean to build anything at present, only I want to have the plans"; the reply we would give in such a case, and which we would recommend every architect to give, would be—"I should be most happy to carry out such a building for you whenever you have made up your mind; but I decline to hand over to you plans of mine to carry out as you please; my business is to produce buildings, not to make drawings for other people to make use of." If a few architects would have the spirit and independence to assume that position, it would do more than anything else to get rid of the mistaken ideas of the lawyers and of some clients, that the client pays for drawings and has a right to claim them.

But however mistaken the practice of the profession may have been in the case in which buildings are designed but not carried out, there can be no question that in that large majority of cases in which they are carried out, professional custom has always ruled that the drawings are the architect's—that they are his tools of trade, and that the client has nothing to do with them whatever; that this is the verdict equally of justice and commonsense; and that the law, based on a precedent which is at best only a one-sided one, is most unjust and injurious, and indeed almost insulting to the architect. He is told, indeed, that he may make it a provision in his contract with the client that the drawings are to remain his property. But, in the first place, to assume the necessity of making such a provision is to give up the whole principle we are contending for; and, in the second place, to make such a proviso in words is simply paving the way for discord. Do we not know perfectly well that in every case where an architect has a contentious and exacting client (and how many such clients there are architects know to their cost), the mere introduction of such a clause would be an immediate suggestion to the client to oppose it and to make it a bone of contention? And why should the onus be put upon the architect of making a special contract to secure what ought to be his by right and reason?

We are not making these remarks with any special reference to the case which has just been decided; we know nothing of either party to it, and have no personal concern whatever in regard to it. It is the principle on which it has been decided that we complain of; the mis-

leading and unfair precedent that has been established by law. We may have "*Ebdy v. McGowan*" either reversed or at all events confined in operation to the class of cases which it really covers. And in our opinion the newly-constituted "Board of Professional Defence" of the Institution of Architects ought to take the question up seriously, and, if judges and courts are deaf to them, approach Parliament with a view to procure an alteration of the law, which as it stands not only involves a gross injustice to architects but proceeds upon a totally wrong assumption as to what architecture is and what is the function of an architect. If the Board of Defence can deal with such a matter as that, we can see what was the use of its formation. And we may add that anyone who wishes to bring the subject before an authoritative tribunal may rely on any assistance which could be given him by the evidence of the editor of this journal, whose opinion on the *rationale* of such a subject I venture to think, be supposed to count for something—even with lawyers.

RURAL BUILDING BY-LAWS

THE agitation about the administration of the Building Acts, which may be said to have commenced with the case of *Till*, at Eynsford, has at last taken a practical form of a deputation to the President of the Local Government Board, very influentially attended. The objections urged by the deputation were that the by-laws governing the building of cottages were enforced by those having insufficient knowledge, (which is more serious) a personal interest in conflict with some of the principles of the undertaking the building of cottages, well as an inclination to magnify office by enforcing by-laws unsuited to the locality in a vexatious manner. The root of the evil seems to be that section 276 of the Public Health Act, 1875, the option is given to the Local District Councils in their discretion to apply the by-laws suitable to the urban districts to the rural districts. In reply of the President of the Local Government Board was highly sympathetic, but how far was it practical? The department has framed model by-laws for both urban and rural districts and with those by-laws, if applied in rural districts for which they were intended, we understand no cause of complaint would arise. The President stated, moreover, that the Local Government Board exercised its powers in correspondence to urge the local authorities to satisfy themselves that the by-laws were suitable to the districts in which they were to be applied, but that they could go further, and that the Department was not responsible for the constitution of local authorities. This reasoning hardly satisfies those who have a matter at heart. It is common knowledge that those who constitute the local authorities are not persons who could wield the unlimited powers of interference and obstruction conferred on them by the law as it at present stands, even apart from the question that in rural districts the councils are consti-

of persons having a direct interest in building schemes themselves, either as builders or as persons whose favourite investment is cottage property. The question to be answered is, how comes it that those responsible for the legislation in reference to local government have given bodies so constituted an unlimited discretion to apply by-laws to districts in which some of them are not appropriate? That is the point upon which the deputation were entitled to a more definite reply, and to an assurance that the Government would support an endeavour to obtain a reform of the law.

The æsthetic side of the question to most landlords and to all lovers of our countryside, is more important than the financial aspect. It is only necessary to regard the cottages erected by the district councils themselves to have some idea what the application of urban by-laws is doing for the country. In some absolutely pastoral districts are now to be seen rows of cottages suitable only to congested manufacturing districts. The cottagers are consequently herded together with no paving and with little contiguous back yards, and this leads, moreover, to serious danger in rural districts in time of epidemics. Where segregation is impossible, and where hospital accommodation is limited, as it always is in rural districts, these hlocks of so-called sanitary dwellings become a hotbed for infection. We think that a case has been made out for legislation on this question. The Local Government Board may be unable to control the action of the urban district councils, but it certainly should have authority to prevent them wielding inappropriate powers to the disadvantage of the rural community.

As Mr. Long observed in his reply, Sir W. Grantham seemed to complain not so much of the By-laws themselves as of the persons by whom they were left to be enforced. This is a complaint which applies to other than what are properly "Rural" districts. Any one who has studied, as we have, the various Reports made by medical inspectors to the Local Government Board in regard to the sanitary condition of Urban Districts, will have come again and again upon the complaint of the inefficiency of local sanitary and building inspectors, coupled with (and to a great extent explained by) the utter inadequacy of the salaries offered or paid. If building in rural districts is to be subject to official supervision, certainly it is a matter for serious complaint if the officials themselves are ignorant and inefficient. But we do not feel at all sure that the ignorance and inefficiency are all on one side. Sir William Grantham complains bitterly of the obstacles put in his way of building cottages as he pleased, and with such construction as he thought sufficient. But some of Sir W. Grantham's cottage plans have been published in magazines that have taken up the subject as a popular one; and we should say that they showed that the gentleman who devised them was very much in want of trained official supervision. They appeared to us to be ridiculous both as drawings and as plans, and we could feel no surprise that an official should say that he could not understand them. He may have been a very

incompetent official; be that as it may, a competent one would surely have equally disapproved of them. That landlords should be able to build cottages in a cheap manner is desirable, rather than that they should find it impossible economically to build them at all; but cottages of cheap materials require good planning as well as any others; and good planning is not a thing that "comes by nature," as Dogberry said of reading and writing.

The Model By-laws of the Local Government Board include a great many provisions which in their nature cannot apply to cottage-building in rural districts; but those which can so apply are not really so drastic or absurd as is represented. The practical prohibition of thatching is unnecessary for isolated cottages, and thatch is both a warm and a picturesque roof covering, and quite a suitable one for such buildings. In regard to the walls, the provision for the employment of "brick, stone, or other hard and incombustible materials," does not exclude, for example, cement slah cottages. And when the By-laws allow timber-framing only with the proviso that there shall be 4½-in. brickwork at the hack of it, is that so unreasonable? Any one who has ever stayed, in winter, in a country cottage with the walls formed of timber-framing with lath and plaster between, will probably be able to testify that it makes a remarkably cold abode. The provision, again, of a layer of concrete over the site, and of damp-preventing courses, is only a provision for things without which a cottage cannot be really healthy to live in.

The valid objection is to the imposition of hard-and-fast rules which may exclude constructions that are really quite adequate but do not come within the wording of the By-laws. Proposals for cottage construction should be judged on their merits, not on the wording of By-laws framed within too narrow limits. And if official authority is to be exercised, steps should be taken to ensure the appointment of officials who are competent to act. But we are by no means disposed to think that improvement would necessarily result from freeing well-meaning landlords from all official control, and allowing each one to build as he pleases. Well-meaning people sometimes make serious mistakes. And it is doubtful whether it would be a real kindness to rural tenantry to leave landlords to build cottages as they please, on the plea that (for economical reasons) they must have this or nothing. There are two sides to the question; and just at present it seems to be entirely the landlords' side which is evoking public sympathy. Leave us to build as we like, they say, and we will provide our tenants with homes. But will they be healthy homes? And are the landlords always safe, or indeed entirely disinterested judges on that point?

THE SURVEYORS' INSTITUTION.—The Council gold medal has been awarded to Mr. John Smith Hill, B.A., B.Sc.Lond. (Associate), for the best paper read by a member of the Institution during the session 1903-4.

RESTORATION OF THE PARISH CHURCH, PORTSMOUTH.—The restoration of the Church of St. Thomas à Becket, at Portsmouth, has now been completed, and the building was reopened on the 8th inst. The work has been carried out under the supervision of Mr. T. G. Jackson, R.A.

DRAINS AND SEWERS.

TWO most important decisions have been given by the Court of Appeal under the Public Health Acts on the ever-green question of drain or sewer. By the Public Health Act, 1875, section 4, "Drain" is defined as "any drain of and used for the drainage of one building only or premises within the same curtilage, and made merely for the purpose of communicating therefrom with a cesspool . . . or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed." "Sewer" includes "sewers and drains of every description except drains to which the word 'drain' interpreted as aforesaid applies. . . ."

We have already in these columns drawn attention to the uncertainty which has been created in the law by this schoolboy method of defining a word by a repetition of the same word, and some of the cases under this section were set out by us in an article in our issue of June 27, 1903, in which it was shown that the liability could be shifted from the shoulders of the private individual and placed on the urban authority, even by an illicit connexion by a neighbouring owner with the drains of another house.

The present decisions deal, however, with the Public Health Acts Amendment Act of 1890, which has been the cause of considerable litigation. Section 19 of this Act has varied the above definition as follows:—"Where two or more houses belonging to different owners are connected with a public sewer by a single private drain, an application may be made under section 41 of the Public Health Act, 1875, and the local authority may recover any expenses incurred by them in executing any works under the powers conferred on them by that section from the owners of the houses." These powers are the abatement of nuisances arising from drains. Sub-section 3 provides that "For the purposes of this section the expression 'drain' includes a drain used for the drainage of more than one building." The two cases now decided by the Court of Appeal—Thompson v. Mayor of Eccles and Hardie v. Friern Barnet Urban District Council—arose on practically similar facts. A certain number of houses or blocks of houses, some of them in different ownership, were drained into a drain which was laid in private ground, and ran along the houses, and which carried their drainage into a main sewer. In the first case the owner of seven houses was being sued by the corporation in respect of work carried out by them in abating a nuisance from the drainage of one of his houses. In the second case the corporation were being sued by the owner of four houses to recover the expenses of work done at the request of the corporation. A great number of contradictory cases were cited to the court, and now we have at last a clear pronouncement of the law by the Court of Appeal, which comes to this, that where there is a drain laid in private property receiving the drainage of two or more houses belonging to different owners, not being a drain which any

member of the public has the right to use by connecting it with the drain from his own house, that is a single private drain within the section. This decision approves two decisions that have recently been decided by Divisional Courts—*Self v. Hove Commissioners* (1895), and *Bradford v. Mayor of Eastbourne* (1896), but of course leaves the anomaly created by the Legislature that when the houses are in the same ownership, but are separate buildings, then a similar drain is repairable by the urban authority—as in the case of *Travis v. Uttley* (1894).

In the second case a further point was raised that all the owners of the private drain should be served with notice and the expenses apportioned, but the court disposed of this contention, since in fact the nuisance had been localised by the urban authority as being upon the plaintiff's premises.

NOTES.

London Squares and Enclosures. THE Bill drafted by the London County Council for the prohibition of building on the gardens of squares and other specified lands in the administrative county of London relates to what we find are as many as 411 enclosures and spaces, which are bounded by roadways and occupied premises. The comprehensive scope of the measure may be estimated from the fact that it ranges from such open areas as that in front of the houses of Audley-square at the end of South Audley-street, Mayfair, to the gardens of all squares, crescents, terraces, and so on, and all such secluded enclosures as the gardens of our Inns of Court and the pleasure-grounds of Carlton-gardens at the rear of Pall Mall. The freehold of many of the railed-in enclosures appertains to the Bedford, Westminster, Lord Howard de Walden (formerly Portland), Portman, and other opulent estates. By way of inducing private owners to agree to the prohibition of building in the future, the Council offer to secure legislative exemption of the ground from any scheme of taxation in respect of land and site values, and, in addition, to take over lands into their own control and maintenance as "open spaces," or as may be otherwise agreed upon between them. The Bill will provide means for continuing an owner in his existing rights in the event of an equivalent area being set apart and brought within the operation of the intended Act. In a few instances the lands are automatically protected by the circumstance that it is well-nigh impossible to build upon them and at the same time to satisfy the requirements of existing statutory regulations; in some others the tenants of the surrounding houses possess under covenant certain rights as to user and enjoyment which enable them collectively to withstand encroachment upon the part of their landlords.

Railway Rates. A STATEMENT was made some weeks back to the effect that an advance of 1d. per ton had been made by the railway companies on the rates for conveyance of all coal brought into London by

rail. This provoked a perfect storm of indignant protest—out of all proportion to the amount of the impost. Consumers would suffer, the coasting trade would benefit (for coal would come by sea instead of by rail), and other far-reaching results were predicted. The mere mention of advances in railway rates affects some people in the same way as a red rag does a bull. It is the same with the word "foreign" when railway charges are under consideration. At a great meeting once held in the City to denounce the enormities of the railway companies, a printed form was produced headed "past foreign overcharges," which was held to prove that surreptitious allowances were being made in respect of foreign traffic. But, as a matter of fact, the objectionable document merely related to disputed charges on traffic from other English lines; for each railway company alludes to traffic from other lines as "foreign" (their own being "local"). We now notice, from an announcement in an official railway journal, that the 1d. per ton advance on coal is confined to five collieries only, and that the quantity of coal sent from these pits to London is very small. So much for this particular railway rates scare.

Ventilation of Railway Carriages. IN spite of various ingenious devices which have been introduced, the ventilation of ordinary railway carriages is best attained by the open window policy. This is extremely efficacious and generally quite comfortable for the happy person who sits next to the window with his back to the engine. But the occupant of the corresponding seat at the other end of the carriage often gets a draught, reflected from the opposite wall, down the back of his neck, and passengers facing the open window receive a strong blast in their faces. Thus it will be seen that the system results in the smallest benefit to the greatest number. On some Continental railways an attempt has been made to deal with the problem by providing a loose board which can be fitted into the window sash, so as to project at right angles from the outside of the carriage, and thus shield the window opening in some measure from the draught created by the rapid motion of the train. It has been suggested that a similar arrangement might be applied with advantage to all railway carriages of the old-fashioned type in this country. Unfortunately, there are practical objections to the employment of such a device. In the first place, it would be necessary to make the wind deflector a permanent fitting, and to fix one on each side of the window for use in either direction of the train. Then the deflectors would have to be hinged and provided with catches to hold them in the required position, and they would have to be provided with other catches to hold them flat against the outside of the carriage when not in use. Further, unless the width provided were at least from 6 in. to a foot, the maximum benefit would not be derived, and a width of even 6 in. would mean that the deflector, when folded back, must cover a portion of the side window, blocking out light and

preventing its occupant from enjoying an unimpeded view of the external scenery. Altogether we are not certain that this contrivance would be generally appreciated by the public, especially in view of the increasing adoption of corridor carriages on long distance train services.

Hydrodynamics and Magnetism. THE paper on "Hydrodynamical and Electro-magnetic" experiments, by Professors Hele-Shaw and Hay, which was read this week to the Institution of Electrical Engineers, is not only of great scientific interest, but is also of considerable value to the designers of dynamos. The late Sir G. G. Stokes pointed out in 1898 that the lines of flow in an ideally perfect fluid which had no viscosity were identical with those of a very viscous fluid, provided that both fluids moved between parallel plates at short distance apart. Professors Hele-Shaw and Hay were able to map these lines by forcing clear glycerine, into which had been injected thin streams of glycerine coloured with an aniline dye, between parallel glass plates very near together, in which obstacles of various shapes could be placed. When the motion had become steady they photographed the slides, the coloured streamlines of glycerine representing the direction of the flow of the molecules of the liquid. In a paper which they published in the Transactions of the Royal Society three years ago they showed that their experimental results were in exact accordance with the predictions of the theory. Now Kelvin and Clerk Maxwell showed many years ago that the mathematical solution for the lines of flow in a liquid was the same as the solution of the analogous problem for the "lines of force" in magnetism. As a matter of fact, also, the solution applies equally well to Faraday's "tubes of force" in connexion with electrified pith balls and to the "lines of flow" of electric current in metal sheets. As the authors have obtained the hydrodynamical solution they have therefore solved also the electrical and magnetic problems. They are thus able in their paper to show electricians how the magnetic lines of force in dynamos cross the air-gap between the field magnet poles and the armature, and to give them useful formulæ and tables. Some of their results have been anticipated by Mr. F. W. Carter, who, by applying the mathematical method of conjugate functions, developed mainly by German mathematicians, obtained complete solutions of the magnetic problems in those cases where the field poles and the slots in the armature were rectangular in shape. The experimental methods devised by the authors of the paper is a triumph of ingenuity, and, if necessary, it could be applied to the study of problems which have not yet been attacked mathematically.

Hawkmoor's Grave, Shenley. IN the course of some renovation works that are being carried out under the superintendence of Messrs. Hopkins & Walker at the parish church of Shenley, near St. Albans, the tomb of Nicholas Hawkmoor has been repaired. The brickwork, which rises to about 18 in. above

ground, is set in order, and the crack across the tombstone has been cemented. The grave lies beneath a yew tree at the east end of the church. Hawksmoor, aged seventy-five years, in his house at Millbank, on March 25, 1736, few months after he had completed the two towers of Westminster Abbey—a which it was intended to erect spires 100 ft. high. He had been appointed surveyor-general to the fabric after Wren's death in 1723, and N. Blackerby, his son-in-law, records that he made a noble design for repairing the west end of Westminster Abbey." Hawksmoor entered Wren's service as a domestic clerk, or assistant, when eighteen years old; in July, 1735, he was surveyor-general, and during the last few months of his life is variously described as "surveyor-general" and principal surveyor of His Majesty's parks." After Gibbs's resignation he was appointed in January, 1716, as first surveyor to the Commissioners, in connection with J. James, for the building of the new churches in London; ten years afterwards he became deputy-comptroller under Vanbrugh, who died in 1726. A skilful mathematician and geometer he emulated the attainments of the first master. He was, besides, an accomplished draughtsman, and possessed an uncommon knowledge of architectural history and literature.

St. Paul's Chapel, Great Portland-street, and St. Peter's, Vere-street, Oxford-street, known as the rhyebone Chapels, have drafted a Bill provide for the demolition of the first-named chapel, and the vesting of the same in the Ecclesiastical Commissioners, together with a transfer of all present lands and securities held by the trustees, and the proceeds of the sale of the site materials, to the Commissioners. The chapel was built upon the site of Mary-one basin which supplied that part of the town with water, in 1760-6, at a cost of 5,000*l.*, from plans and designs for the Classical style, by S. Leadbeater (Leadbetter). Originally called Portland Chapel, the building was consecrated as St. Paul's on December 31, 1811. The organ, 1879, is by Hill. In number of December 1, 1894, we published an illustration of the pulpit, constructed in 1892 by Messrs. Shuffrey & Co., of Welbeck-street, from a design by Mr. Paul Waterhouse—the work being of fumigated oak, and the pulpit resting in five of its six sides in panels of ebony, box, and walnut wood, decorated with cartouches bearing the sacred names.

UNDER the general title "Italy and her Alpine Walls," Mr. Wallace Rimington exhibits at the Fine Art Society collection of water-colours the special feature of which is the contrast between the beauty of the scenes and cities of the Italian plains and the grandeur of the mountains which form the barrier between Italy and the north. This is a new way of regarding the subject; and some of the rugged wintry scenes on the Simplon certainly present an effective contrast with the garden-

like scenery of many of the other drawings. On former occasions we have thought Mr. Rimington's style in landscape-painting somewhat mannered and conventional; there is less of this defect now, more of freedom and variety; but even now we think the best of all the works in this collection are not the more extensive and more highly finished views, but the few sketches, in a much broader style, of bits of Alpine landscape—"An Alpine Garden" (19), "An Alpine Stream" (36), "An Alpine Meadow" (78), and one or two others. These few drawings form a class apart, and are different from the others and seem produced under a different influence, and we like them best of all. But there are some fine and most interesting views among the others: "From Perugia" (64), with its plain little church and campanile backed by an extended landscape; "A City of Towers—Vercelli" (26); "Assisi" (40), with its ramparts in long perspective; "On the way to Italy" (48) a view from the Splügen; "One of the Gates of Italy—Gondo" (58) an exceedingly striking piece of what may be called natural composition; "In the Engadine" (96), and "A Town of the Adriatic Lagoons" (101). This last the artist describes as "a miniature Venice unknown to the travelling world. It lies in the midst of lagoons larger than those of the far distant mother city, with canals, bridges, palaces and campanilli unspoilt by the hand of the restorer. It is approached by a narrow causeway eight miles long, and is a painter's paradise." Mr. Rimington will not give its name, lest it should get popularised and spoiled; and he is quite right. The drawing is charming; one of the best and most interesting in the collection.

Drawings by Mr. Moffat Lindner. At Mr. Dunthorne's Gallery there is a collection of water-colour sketches of Venice (chiefly) by Mr. Moffat Lindner, whom we have hitherto been familiar with mostly as a painter of effects of cloud and reflection. In the present collection he appears as a painter of architectural subjects. We must say that if architecture is treated pictorially we prefer to see it treated with somewhat more solidity and indication of detail than is to be seen in these sketches. Seen at a requisite distance, one may admit that the general effect of the buildings is conveyed, and moreover that they have an upright and structural appearance, as if solidly founded; but they are totally destitute of form in detail; mere spots of colour, windows represented by formless splashes, etc. That may serve to give the general effect of Venice in an artistic sense, but architecture is worth more careful treatment than that; and while the general colour effect is good, one becomes rather sceptical about its worth when we see that the front of the Ducal Palace, of which the arcades are stone and the upper portion brick, is shown as all of one tone from base to cornice. Some of the scenes in which water and shipping predominate are very good; "On the Maas" for instance (one of the few non-Venetian subjects); and the sketch of an effect of

"coming storm" at Venice is powerful. But generally speaking, the style of the sketches is too slight and visionary for scenes in which architecture forms an important element. We congratulate Messrs. Dunthorne on the great improvement they have made in their gallery by the recent alterations.

Mr. Fedden's Pencil Drawings. A COLLECTION of pencil drawings by Mr. A. Romilly Fedden, on view in a new small room which has been added to the Fine Art Society's suite of galleries, is a very good illustration of the interesting work that may be done by the pencil, without making any attempt to go beyond the proper capabilities of this instrument of artistic expression. The drawings are all small, and consist of town and village scenes under different aspects, alternating with studies of heads; The latter are all well executed but not mostly very interesting in character; the scenes form the best part of the collection, and are very effective, while they represent what may be called an excellent pencil style. "The Harbour" (42) we may mention particularly as one of the best. "The Haunted Room" (41), in which a figure of a woman, with her back to the spectator, looks through an open door into the darkness of a passage, is a very suggestive little picture, reminding one somewhat of Fred. Walker

THE INTERNATIONAL GAS EXHIBITION.

L. LOHR.

ON Saturday last an International Gas Exhibition was opened by the Lord Mayor of London, at Earl's Court, London, and it is to remain open until the 17th prox. Although the exhibition is described as international, the foreign exhibits are very few. This is not so regrettable in connexion with the gas industry as it would be in the case of some other industries, for Great Britain, the birth-place of the gas industry, has up to the present date retained its leading position as gas maker and gas consumer, and has little to learn from abroad. That the streets of some Continental cities are better lighted than many English towns, is due neither to the use of a better quality of gas nor to the use of superior burners or mantles, but to greater generosity in the consumption of gas and more careful attention to the condition of mantles and lanterns. In recent years Berlin has acquired a reputation as the best lighted city in Europe, yet Berlin is supplied with a lower grade gas than London. Paris also uses a poorer gas than is used in London. That the brilliant lighting of Berlin streets is not due to electricity is evidenced by the official statistics recently published, for of the total of 23,903 lamps in the city streets, 23,215 are incandescent gas lamps.

Great Britain possesses a magnificent stock of good gas coal; and for this reason gas, as compared with electricity, is cheaper here than in most other countries. That the fact that lighting can be efficiently and cheaply performed by gas is now becoming generally recognised, even by municipal authorities, is shown by the decision that the important new London thoroughfares, Aldwych and Kingsway, shall be lighted by incandescent gas lamps. The high-power lamps which have been selected for the lighting of these and other streets of importance may be seen at the exhibition, and if these lamps could be seen side by side with the best lamps exhibited in the last important gas exhibition, which was held at the Crystal Palace in 1882, the contrast would be most striking. Since 1882 the Welshbach system of lighting, and gas engines of high power, have been introduced, and gas has come into general use for cooking and heating purposes; and, in consequence, gas is now valued by its calorific value and flame temperature, instead of by its candle-power when consumed in an Argand burner. Pedagogues, with their proverbial conservatism,

still cling tenaciously to the Argand burner for testing purposes, but it has long since been laid aside in favour of the thermo-couple and the calorimeter by business men.

High-Pressure Gas Lamps.—The high-pressure lamps are naturally the first objects to attract attention in the exhibition. These lamps depend for their efficiency upon the increase in flame temperature obtained by increasing the pressure under which the gas is supplied to the burner. The compressed gas passing into the tube through the air-holes a larger proportion of air than would be drawn in by gas under normal pressure. Combustion at the burner head, therefore, takes place more rapidly; and a shorter and hotter flame is produced than would result from the same volume of gas mixed with less air. Normal pressures in gas mains vary from $1\frac{1}{2}$ to 4 in. of water, and by the use of compressors the pressure under which the gas enters the burner is increased from 16 in. (Sugg & Company's lamp) to 57 in. (British Compressed Gas Company's lamp), according to the views of the different manufacturers as to the most suitable pressure to be used for high-pressure lighting. The high-pressure flame is, in fact, a kind of blow-pipe flame, and equally good effects may be obtained by compressing the air supplied to the burner instead of compressing the gas.

We shall not attempt to describe the differences between the various forms of compressors and high-pressure lamps, but mention, as specially worthy of inspection, the "Millennium" lamp of the British Compressed Gas Company, which has recently been adopted for the lighting of Aldwych; the Keith lamps, with which a portion of the Queen's Palace is lighted, and of which some extremely satisfactory specimens may be seen in various conspicuous spots in the City streets; the high-pressure lamps exhibited by Messrs. Wm. Sugg & Co.; and the "Pharos" lamps, with which the main entrance leading up to the Ducal Hall is lighted.

Self-Intensifying Lamps.—Instead of obtaining an increase in the proportion of air drawn into the mixing tube of the burner by increasing the pressure of the gas flowing into it, the gas may be allowed to enter under normal pressure, and by enclosing the mantle and head of the burner in a glass case, which admits very little air to the burner-head, and which terminates upwards in a long chimney, a description of "forced draught" may be created. This forced draught will result in an increase in the proportion of air pulled through the air-holes into the mixing tube. The increase in efficiency thus obtained is not so great as that obtained by the use of modern high-pressure systems, but the results obtained are very good, and a point in favour of self-intensifying lamps is that it is not necessary to provide compressing plant. Good examples of self-intensifying lamps are the "Lucas" lamps, exhibited by Moffat's, Limited.

Gas Arc Lamps.—The term "gas arc" lamp is applied to a gas lamp which resembles an electric arc lamp in general appearance. Excellent forms of gas arc lamps are the "Humphrey" lamp, exhibited by Messrs. E. C. Haywood & Company; the "Khoma" lamp, exhibited by Messrs. Clark W. Harrison & Company, and the lamps from the Crown Lamp Works. The "Humphrey" lamp is particularly pleasing because, while emitting brilliant light, the light is softened and the eyes are protected from direct rays from the mantle by a large clouded spherical shade. Some of the gas arc lamps are forms of self-intensifying lamps.

Inverted Burners.—To obtain a gas lamp free from downward shadows, burners have been devised which will throw a non-luminous flame in a downward direction, and which, when fitted with a suitable mantle, will raise the mantle to brilliant incandescence. These inverted gas lamps possess all the æsthetic advantages of incandescent electric lamps. The exhibits include some clusters of very small incandescent inverted lamps mounted on handsome standards, and these form the most attractive description of gas lamp for the lighting of halls or wide passages which we have yet seen. Inverted lamps are well represented by the exhibits of the New Inverted Gas Lamp Company, the Star Inverted Incandescent Burner Company and Messrs. Falk, Stadelmann & Company.

Ordinary Incandescent Burners.—Incandescent burners and shades of all the descriptions

in common use are exhibited, but these are so familiar to our readers that they do not require description. A very comprehensive collection of these goods may be seen on the stands occupied by Messrs. Falk, Stadelmann & Company.

Gas Light and Coke Company's Exhibits.—Earl's Court is situated within the area supplied with gas by this company, and they have constructed, as part of the Exhibition, a model workman's parlour and kitchen, and have fitted them with gas appliances in the style in which they are prepared to fit up the homes of the working classes. The company bear the initial cost of these gas installations, but the consumer pays a higher price for gas to cover the cost of the prepayment meter, stove, fittings, and pipes. The company have already about 185,000 of these penny-in-the-slot meters in use in the district they supply with gas, and they collect therefrom over 100 million pennies per annum. The fittings provided include a cooker and a grill or boiling-ring. A series of furnished rooms representative of a modern flat have also been provided with gas fittings under the supervision of the company.

Gas Mantles.—A host of mantles of different brands are exhibited by the various manufacturers and importers of these goods. The Voelker Incandescent Mantle Company have a large stand, upon which they demonstrate some of the methods used in the manufacture of Voelker mantles. This is a very interesting exhibit. The Buhlmann Incandescent Syndicate exhibit mantles manufactured in their factory in East London. These mantles are "burnt off" by machine instead of by hand, and are remarkably uniform in shape. The syndicate also exhibit an ingenious apparatus for testing the ability of mantles to resist injury when subjected to severe shocks. By means of this device the great difference in strength between some of the numerous brands of mantles placed on the market by various manufacturers may be demonstrated. Among the other mantles to be seen at the Exhibition mention may be made of the well-known "Veritas" mantles shown by Messrs. Falk, Stadelmann & Company, the "Bray XXX" mantles shown by Messrs. Geo. Bray & Company, the "G. I. C." mantles of the General Incandescent Company, Limited, and the "Ino" mantles of Messrs. Julius Norlen & Company.

Self-Lighters.—Devices which possess the power of igniting coal gas when exposed in air to their influence are exhibited by Messrs. Dae & Company, of Berlin, and by Mr. Jacques Kellermann, of Berlin. These more or less resemble some of the self-lighters which have become familiar to the public during the last few years; but whether improvements have been effected which render them reliable self-lighters in all seasons, and after prolonged use, we are not in a position to state.

Illuminated Advertisements.—A form of illuminated advertisement, which is attracting much attention at the Exhibition is exhibited by "Chameleon Signs, Limited." Any advertisement may be illuminated by this device at trifling cost by gas, and all the lettering is made to attract attention by appearing in a combination of constantly-changing colours. But while we mention this as an ingenious contrivance, we have no desire to see this form of advertisement adopted. We have already too many of them, and they are an irritating nuisance in our streets at night.

We shall have further comments to make on the exhibition.

CITY BUILDINGS AND FIRES.—Notification is given of an intended application to Parliament next Session by the Corporation for leave to bring in a Bill to require owners of houses and buildings within the City of London to provide stairways or other means of escape from fire. Authority will be asked for to empower the Corporation to apply for and the Court of Summary Jurisdiction to make orders requiring owners to construct such means of escape from fire, or, in case of their default, for the Corporation to provide the same at the owners' cost; and to impose and recover penalties.

INSTITUTE OF BRITISH DECORATORS.—A lecture on "Pompeii" was given by Mr. Hugh Stannus, on Monday evening last, at Painters' Hall. The lecturer gave a brief account of the history of the place, and of the catastrophe by which it was destroyed, and then, by a series of photographs shown on the screen, led his audience through the most interesting of the streets and buildings.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The usual fortnightly meeting of the Institute of British Architects was held, No. 9, Conduit-street, Regent-street, on Monday evening, Mr. H. T. Hare, Vice-President, in chair.

The minutes of the last meeting were read.

The Late Mr. Norton.

Mr. Graham (Hon. Sec.) said he regretted to announce the death of Mr. John Norton, F.R.S.A., F.R.A.S., F.R.I.B.A., F.R.I.C.A., F.R.I.C.E., F.R.I.C.S., F.R.I.C.S.A., F.R.I.C.S.E., F.R.I.C.S.M., F.R.I.C.S.N., F.R.I.C.S.O., F.R.I.C.S.P., F.R.I.C.S.Q., F.R.I.C.S.R., F.R.I.C.S.S., F.R.I.C.S.T., F.R.I.C.S.U., F.R.I.C.S.V., F.R.I.C.S.W., F.R.I.C.S.X., F.R.I.C.S.Y., F.R.I.C.S.Z., F.R.I.C.S.A.A., F.R.I.C.S.A.B., F.R.I.C.S.A.C., F.R.I.C.S.A.D., F.R.I.C.S.A.E., F.R.I.C.S.A.F., F.R.I.C.S.A.G., F.R.I.C.S.A.H., F.R.I.C.S.A.I., F.R.I.C.S.A.J., F.R.I.C.S.A.K., F.R.I.C.S.A.L., F.R.I.C.S.A.M., F.R.I.C.S.A.N., F.R.I.C.S.A.O., F.R.I.C.S.A.P., F.R.I.C.S.A.Q., F.R.I.C.S.A.R., F.R.I.C.S.A.S., F.R.I.C.S.A.T., F.R.I.C.S.A.U., F.R.I.C.S.A.V., F.R.I.C.S.A.W., F.R.I.C.S.A.X., F.R.I.C.S.A.Y., F.R.I.C.S.A.Z.

Ferro-Concrete.

In the absence of Mr. W. Dunn the illness, a paper by him on "Ferro-Concrete" was read by Mr. R. Watson. The following is an abstract of the paper:—

Mr. W. Dunn said that, owing to unpleasant experiences, there was a feeling among many architects and builders that concrete was a treacherous and unreliable material. In all such experiences there is something mysterious; the cement, from a maker of established repute, has been specified "Best London" Portland cement, the sand and gravel looked clean, the builder was an honest man. Nevertheless, it failed to set; it cracked; it thrust out of walls, and generally led to a great deal of trouble. To make good concrete much care in the selection of the materials and in the mixing is required. The cement was the most important ingredient, and the only way to get good cement was to test it constantly and to get that which was faulty. That was the only way to ensure that only good cement was used. The fact that it is frequently tested by the known to the merchants, it will be found a dangerous article, such as bad cement would be less and less frequently sent to floors, walls, roofs, or pillars are made of concrete, a bad cement is really dangerous. It would be an excellent plan if the Institute of British Architects, and the cement makers could agree upon a standard suitable for architectural work. But until such a standard was fixed, architects must describe it themselves in their specifications. Many cement makers had given model specifications, but the same points in cement specification require building work which a cement expert should know.

Fineness of grinding is all important, and the very fine particles have cementitious qualities. Foreign makers were much ahead of us—two or three; now we can get English cement which will all pass a 76 by 76 and leave 10 per cent. on a 180 by 180 sieve.

This is a very fine cement, and perhaps good for ordinary work. All, however, to pass 50 by 50 and leave only 5 per cent. on a 120 by 120 sieve. A good cement is one which we make a stronger mortar or concrete with much less of it, so that the extra cost is more than repaid. The particles which are more than 50 by 50 sieve are practically so much waste.

The author strongly urged the use of the setting cement. Pats made with the minimum quantity of water should set in not less than five hours when the temperature is at 60° and in not less than twenty minutes when the temperature is at 75°, and proportional time when the temperature is between 60° and 75°.

Soundness or constancy of volume is the most important qualities a cement should have. Tests without elaborate apparatus are fortunately available. Make two cement balls on small pieces of glass, tap them out to a spherical shape, about 3 in. diameter, $\frac{1}{4}$ in. t.

the centre, and with thin edges; keep one under water and one in air for several days. The cement should then show no cracks, change of shape, or tendency to curl off the glass, if found. The author went on to describe other methods of testing, and strongly urged architects to test their cements by one and all of them as often as they could. It would save many after troubles.

Tensile strength he regarded as the least important; it is the test on which the most varied results may be got by different observers according to the method employed in filling the briquettes. A strength of 400 lb. per sq. in. at seven days and 25 per cent. increase in twenty-eight days is usually asked for and easily obtained; many briquettes he had found go up to nearly 1,000 lb. at seven days.

It is not unusual to specify that sufficient cement should be delivered on the works at starting, kept stored in a dry weather-proof shed to a depth of not more than 2 ft. and turned over daily for a fortnight before use. It is found that makers send out the cement hot from the mills, and (unless it is a very high-class cement) it is much improved by air slaking. Aeration seems to improve an inferior cement by the slaking of the free lime, which if it took place in the work would be dangerous. A thoroughly sound cement should have no free lime in it, and is not improved by air slaking; it rather suffers; cement in which there is no free lime can be produced by the maker, but it requires much care in the making, and is consequently expensive.

As regards the aggregate, the strongest concrete is made with broken stone and gravel; the size should vary from large sand to small stones, passing a 1 in. mesh, for floors or walls, to 1 1/2 in. even more for foundations. The cleanliness of the aggregate and the water is most important, as is also the cleanliness and sharpness of the sand. Small sand, such as would run in a hour-glass, is utterly useless—the sand must be fairly large and sharp; it should vary in size; the more uneven the sizes the smaller the voids. The finer the sand the less the strength. There could never be more than three of sand to one cement.

The author described the process of mixing concrete, which should always be done under supervision. Concrete mixing machines are such used in America and on the Continent, producing very good and uniform results. These machines are rarely seen here. One has frequently seen on a building a lot of concrete mixed up, and left for an hour or so before being put in place. If too stiff more water was added. The treatment of the material invites disaster; initial set begins very quickly, and the concrete should be put in position as soon as mixed, and without a moment's delay. When the concrete is eventually laid on the surface, or put in the moulds, it is put in in layers 2 in. to 3 in. thick, and beaten down by iron heaters very carefully all over. This is essential in order to prevent the formation of voids, and to increase the resistance of the concrete.

Mr. Dunn then treated in considerable detail of the strength of the material in place, describing various tests of cement made by eminent scientists, and illustrated by diagrams and mathematical calculations. For further mathematical investigation of the subject, he referred those interested to Professor Perry's *Applied Mechanics* (p. 345), and to M. Considère's experiments, the results of which are communicated to the French Académie des Sciences in a note of March 18 last—an extract of his communication appears in the *Revue Civile* for April 30. These writers base their discussion on "Rankine's Ellipse" of stress, which, as given in Rankine's own words, not easy to grasp. In Alexander and Thompson's "Elementary Applied Mechanics," however, the ellipse of stress is fully explained, and a preliminary reading of part of the last-mentioned book should enable anyone to follow M. Considère's or Perry's reasoning.

The resistance to the swelling and bursting of concrete to which columns in concrete alone could be subject, can be produced by binding the columns with iron or steel wire. Makers of concrete columns do so bind these according to the effect to be combated is more or less clearly understood. What is done in the Hennebique column is done by other concrete specialists. In all there is first the concrete; second, vertical bars of metal, iron or steel; third, bindings of sheet metal or wire. The method of construction is very simple.

A wooden box or mould is made in which the rods are set upright; one of the bindings is then put in, and about 6 in. or 12 in. of concrete well rammed down; another of the bindings is put in and the process repeated.

The special functions of the vertical rods are (a) to aid the concrete in resisting the compression due to the load; (b) to resist any tensile stress which may be set up in the concrete by unequal loading or by any want of homogeneity in the material itself, which tensile stresses cannot be safely left to the concrete to overcome.

Almost all the makers of reinforced concrete constructions put their trust in the vertical rods of metal, as the special element adding strength to the concrete, if we may judge by the large proportion of metal so used, and by the rules employed to fix the safe load, which rules take no account of the binding.

If there were no initial stresses in the combination the load would be carried by the two materials on the inverse proportion of their rigidities; that is to say, if the concrete were ten times as easily compressed as the iron or steel, the iron or steel would be carrying ten times as much per square inch as the concrete.

But the question is not so simple. Concrete setting in air shrinks, while concrete setting in water expands. Columns for buildings always set in air, and consequently the concrete shrinks. As the concrete adheres rigidly to the metal, the concrete is put in tension and the metal in compression—into a state of internal initial stress—before the load comes on. So strong is this action that the concrete may be at the limit of its tensile strength, and the metal at its elastic limit. No formula has so far been devised which takes this initial stress into proper account.

The function of the bindings is to prevent lateral swelling and bursting. M. Considère was the first to give this its proper consideration and importance. In almost all columns, except M. Considère's, these bindings are usually about 6 in. to 12 in. apart, showing that the true use of the metal is not yet fully recognised.

The author gave the results of some experiments on concrete in compression, armoured and unarmoured, referring to those carried out by Professor Gaetana Lanza, and reported in the "Transactions of the American Society of Civil Engineers," (1903; p. 487); by M. Gary, of the Ecole Polytechnique, at Charlottenburg; by the Commission des Vités de la Société des Ingénieurs et Architectes Autrichiens, reported on in 1901; and others by M. Considère described in his papers on "Resistance à la Compression du Béton Armé et du Béton Fretté," in *Le Génie Civil* (November and December, 1902). Reference was also made to Mr. Dunn's report of the armoured concrete column test in the "Journal" of the R.I.B.A. for November 21, 1903, and to the test of a column made by Messrs. Chittit & Co., and tested at Messrs. Kirkaldy's Testing Works in June, 1904.

The lecturer went on to give the formulae and rules which various constructors use to determine the necessary sizes of reinforced concrete pillars to carry given loads.

As regards fire-resisting properties, from all the reports on the Baltimore fire, whereas intense heat was experienced, as will ever occur, the armoured concrete constructions appear to have stood best. Concrete and iron or steel expand at about the same rate under changes in temperature, and the permanence of the concrete covering in fires is no doubt due to this. There is now no doubt that iron or steel buried in ordinary concrete remains unimpaired for generations.

When an architect decides upon adopting reinforced concrete for a structure, or part of it, he will probably put the work in the hands of a concrete specialist, who makes his own calculations for the strength of the members, and arranges the details of the construction according to his own ideas. But as the responsibility must always in some measure lie with the architect, he will naturally want to check the specialist's work, particularly when the contract has been let in competition, and there is an object in the specialist endeavouring to reduce cost to a minimum.

Monolithic Construction in Hennebique Ferro-Concrete.

M. L. G. Monchel followed with a paper entitled "Monolithic Constructions in Hennebique Ferro-Concrete." He said that it had been his fate to be the pioneer of the new

material in Great Britain. The work of initiation had been arduous, but was not without its compensations, as it had brought him in contact with many English architects and engineers whose courtesy and kind support had been a precious encouragement to him.

Having explained in detail the general principles of Hennebique ferro-concrete construction, M. Monchel said that it was to its great simplicity, to the common-sense which had presided at its conception, that it owed its startling success. Any labourer of ordinary intelligence could be made an apt workman in the material in a few days. He himself had had to form his own gangs of men when he introduced ferro-concrete into this country, and it took him very little time to drill them in the practice of arranging the various parts of a work in which robustness was combined with simplicity.

Respecting the theory of the system of construction, it was evident that the laws, formulae, and methods of calculation used for ordinary materials could not be applied in structures composed of such heterogeneous substances as concrete and steel. It had been objected that their formulae for ferro-concrete was empirical. It was not so, because they had not started their work on formulae. It was only after many years' patient observation of the results obtained that they deduced the formulae which were the bases of all their work.

Ferro-concrete was an absolutely new material, which had come in its time to enrich the engineering world. It could not be treated as a combination of steel and concrete in which the properties of the component elements could be considered and treated separately. It had its own laws of deformation. Experiment demonstrated that a rectangular bar of concrete, when subjected to tension, showed an elongation at rupture of, say, one-tenth of an inch; a bar of ferro-concrete, of the same external dimensions and made of the same concrete, showed at rupture an elongation of an inch; that is to say, ten times greater, before showing any crack or trace of disintegration, than in the first case. The elasticity of the new material was well known; it varied in notable proportions with the distribution of the steel in the mass of concrete.

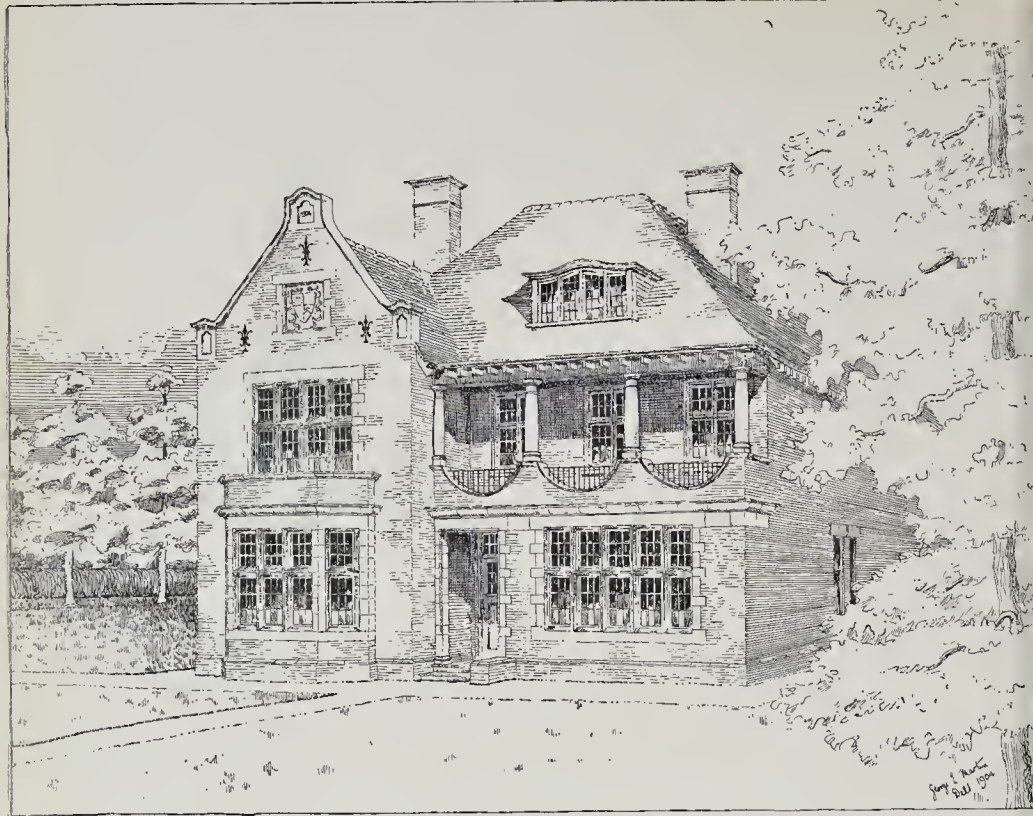
The so-called Hennebique's empirical methods could be relied upon with absolute confidence; for they had been the basis upon which over 12,000 different works had been constructed, and which, in almost every case, had been subjected to severe tests, the results of which had been carefully recorded.

As regards tests, the age of a piece of concrete is a most important element. Good concrete goes on increasing in quality year after year. It is not advisable to test to destruction samples a few weeks or a few months old. No two results will ever be alike, even on two samples of the same age, unless they are composed exactly of the same materials, mixed in identical proportions and by the same operator. The adhesion of concrete to steel increases with the age of the work. Unlike construction in ordinary materials, which, if left to itself, will deteriorate, ferro-concrete construction goes on improving endlessly in quality with age. Tests must be made on the structures themselves.

The Hennebique practice is always to test their structures within a very few weeks after completion with loads 50 per cent. in excess of the calculated load. When the load is removed, it is found that the floor, owing to the elasticity of ferro-concrete, regains its former level, or, at any rate, that the deflection, if any, will be quite inappreciable. It could not be otherwise, for any stress applied to any part of a well-made ferro-concrete floor affects not merely the part under load, but also a very large area of the floor surrounding the part under observation. This is due to the absolute monolithism of the work. Besides static tests, there should be severe dynamic tests; without these the trials of a structure in which concrete and steel are combined are incomplete.

The great security offered by ferro-concrete construction arises from the fact that it never collapses suddenly, but always gives, long beforehand, unmistakable warnings.

The author described an interesting test on a Hennebique beam which he had had carried out at Bermondsey. The beam was placed on two common concrete supports; 3½ tons—i.e., five times the calculated load—was put by degrees on the beam, when the operation had to be stopped, the pillars being



New Headmaster's House, Upper Latymer School, Hammersmith.

crushed and having taken a slanting position, which caused the beam to twist badly. The load was then discharged. The deflection was measured at that point, and the following morning it was found that the floor had sprung back by 1 in. The beam was cracked, but loading might have been continued for some time before complete destruction had not the supports given way.

Buildings of Hennebique construction have been subjected to very unforeseen tests. At Lens, in the north of France, coal silos had been constructed of ferro-concrete 40 ft. high, to contain 1,200 tons of coal. The silos were supported on fourteen pillars. One day, when they were quite full to the brim, a train of coal trolleys came into contact with one of the legs and broke it. The corner of the silo structure was thrown suddenly in cantilever, but, owing to the monolithism of the whole building, no injury resulted to the silos themselves, nor to the other three pillars of the silo affected. They merely had to reconstruct the broken pillar. A car-shed of Hennebique construction at Le Mans was divided in two spans of 21 ft. by a central line of ferro-concrete pillars. One of the cars coming down a gradient got out of control, ran off the metals, and dashed into the central pillar at the entrance of the shed and broke it. The span instantly became 42 ft. instead of 21 ft., but, notwithstanding this, the beams supported by that pillar held perfectly, and did not show the least trace of strain—another proof of the safety due to the monolithism of the ferro-concrete construction.

The construction of ferro-concrete piles the author described as one of the finest, most startling, and most useful applications of ferro-concrete. Their cost is little more than that of a timber pile, and they can bear safely a weight so much in excess of timber piles that a very considerable economy can be effected on the total cost of a foundation. At the present moment a foundation was being constructed in which the use of ferro-concrete piles procured a saving of over 12,000*l.*, as compared with the original estimate for timber

piles. Judicious distribution of steel in ferro-concrete is at the root of success, whether it is in a beam, in a pillar, or in a floor—but, above all, in a pile.

Owing to the absolute monolithism of Hennebique constructions, they are far less liable to vibrations than ordinary constructions. One of the things which strike one most when entering a factory constructed entirely of ferro-concrete, where heavy machinery is at work, is the absence of vibrations and of noise. It is an everyday practice to attach shafting direct to the Hennebique pillars, which consequently have to sustain powerful lateral pulls. Heavy machinery—such as disintegrators grinding heavy materials, dynamos, and dynamo-motors—is also fixed direct on the Hennebique floors; and, after years of that treatment, the quality of the concrete has been found not to have suffered in the least.

Indisputable proofs have been given that the very best material to protect steel is concrete itself. Oxide of iron cannot exist in contact with concrete; rusted bars embedded in concrete will, in the course of a month or so, be as bright as new.

Concrete used in ferro-concrete is markedly different from ordinary concrete, both in its composition, in its make, and in the way it is employed. It is composed of materials of small volume ($\frac{3}{4}$ in. maximum for the gravel or stone), and the materials used are very clean. The proportions of sand and stone are always adjusted so as to give a concrete quite full—it is used in small quantities at a time, and so vigorously rammed that no cavities or porosity are at all possible.

As regards the adherence of concrete to steel, its value is such that it justifies the practice of some ferro-concrete builders who only reckon on concrete to make the junction between the different metallic parts of a structure.

Experiments have demonstrated its surprising resistance to high temperature and sudden cooling. After the most destructive fires, Hennebique constructions have been found

as sound as ever. At the great Baltimore fire the Hennebique buildings stood the ordeal admirably, and they are again in use as before. One of them received on its roof the top store of a high "sky-scraper," and it resisted the shock as well.

As regards ornamentation, there is no reason why ferro-concrete buildings should not be made as artistic as constructions in ordinary materials. There is none that lends itself better, and more economically too, than ferro-concrete to any shape that one may wish to give to it. The author exhibited photographs of some buildings in Paris erected entirely of ferro-concrete which would be an eye-sore to anybody in London. To show the ease with which the material lends itself to ornamentation a photograph was exhibited of the main reception-room in the extension recently carried out at the French Embassy in London. Except the external walls, the whole of the building is in ferro-concrete.

In his concluding observations the author referred to the mischief of the building by force in London. London enjoyed the unique privilege of being the only city in the civilised world where ferro-concrete constructions are actually prohibited. Building regulations of nearly every other city in the United Kingdom did not, read strictly, permit the use of ferro-concrete; but, after intelligent and impartial investigation by the various authorities, Hennebique constructions have been allowed. Such buildings have been erected in London, but only on ground belonging to railway and dock companies. The facts had been brought to the attention of the London County Council when they had applied for permission to erect similar buildings on ground within their jurisdiction; in vain. They always met with the reply:—"The Act stipulates a certain thickness for walls. If you give your walls that thickness you can build." But to give ferro-concrete walls that thickness would be financially impossible and, practically speaking, absurdity, since the comparatively thin

of ferro-concrete are many times stronger and safer than those stipulated in the Act. He trusted that when the new London building by-laws were framed, ferro-concrete construction would no longer be excluded. Ferro-concrete construction is absolutely safe; it cannot lend itself to the malpractices of the jerry-builder. Trickery is impossible with it. Should the contractor try to cheat, try to escape the specification, detection will not occur months or years after, but at once.

The Chairman said the two papers they had listened to were undoubtedly of great interest, but at that late hour in the evening it was quite impossible to allow any discussion, although there were many gentlemen present who would have liked to have made remarks and to have asked questions. All they possibly had time for now was the passing of a formal vote of thanks to the readers of the papers. As it was such an interesting question, it would be quite possible and desirable for them to adjourn the discussion until the next business meeting on December 5, and probably M. Mouchel would favour them with his attendance again, and open the discussion with a few remarks which he had not time to give that night.

Mr. H. H. Statham asked if they would have the papers in print before that.

The Chairman said they would, and they would hope also to have Mr. Dunn with them and the other guests present that evening.

Mr. Graham proposed a hearty vote of thanks to the readers of the papers.

Mr. S. Perkins Pick, in seconding the formal vote of thanks, said he would add but one word. Mr. Dunn stated that the cement was the most important part of the concrete. He hoped when the discussion took place they would have a good deal to say on the aggregate, because in his opinion a great many failures of concrete had come about from the bad aggregate.

The motion was carried, and the discussion was adjourned till December 5.

NEW HEADMASTER'S HOUSE, UPPER LATYMER SCHOOL, HAMMERSMITH.

This house is in course of erection, and is being built in red Sittingbourne bricks and is being built in Monk's Park stone dressings. The house will occupy the site of an old riverside mansion, pulled down some years ago, and the balcony has been provided to take advantage of the excellent views of the river that the site affords.

The contract has been given to Messrs. Frank W. Harris and Co., of Barnsbury, and the joint architects are Mr. W. I. Chambers (of Messrs. Chambers and Martin), London, and Mr. J. H. Brown, Fulham.

RECENT EXCAVATIONS IN THE ROMAN FORUM.

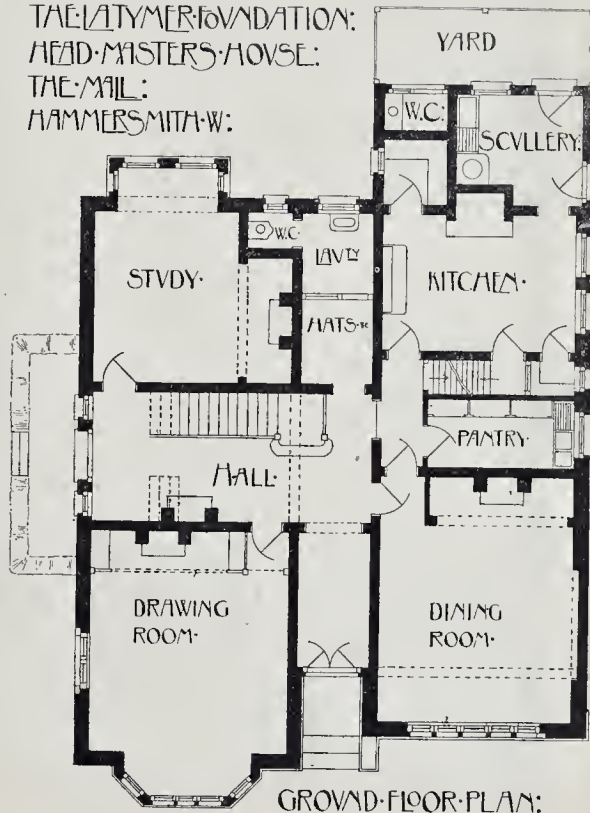
At the London Institution, on Monday evening, Mrs. E. Burton Brown gave a lecture on "Recent Excavations in the Roman Forum."

In the course of the lecture—which was illustrated by lime-light views—Mrs. Brown said her only claim to being privileged to speak about the Forum and the excavations of Comm. Boni was that for eight years she had followed them daily. She had watched so much what had been done and was being done that she could really claim to know at first-hand about the wonderful work he had achieved and was still achieving. He had found all the things which were most significant for their knowledge of the religion and of the political history of the early Romans, in the short space of between six and seven years. The Latin peoples began to come into Italy about the middle of the second millennium before Christ; they were in a pastoral stage, and they settled towards the west on the low hills. The Forum was simply a narrow low-lying marshy valley surrounded by hills, on the top of each hill there being a small community of those Latin peoples settled. The Forum became the market-place of these peoples, who came down from the hills to barter and exchange, and it was owing to the intense loyalty of the Romans to their old early traditions and to anything which had to do with the origin of their State, that the Forum Valley became the centre of the whole of the life of Rome. It was there that the criminal courts were held; that the triumphal processions

passed by; where the buying and selling was done; and where social meetings were held. It was this wonderful loyalty to their own traditions which was one of the great secrets of Rome's greatness, and why it lasted so much longer than the little republic of Greece did. First there were open stalls, and then the great bankers' shops, and so on, which became the cardinal points of interest in the Forum as a market-place. Mrs. Burton Brown proceeded to point out the principal features of the Forum and the buildings adjoining on the map thrown upon the screen. As they knew, records of early races had been found generally to be better preserved in tombs, and Comm. Boni pointed out some years ago that they knew there was a sanitary law in Rome which precluded the burial of the dead in houses, and he believed that as the Forum Valley lay in the midst of village communities there would probably be tombs there. He dug in many parts of the Valley, but most of the old tombs had been destroyed by the foundations of later buildings. Just at the end of the Esquiline Hill, however, he found an interesting and exceedingly primitive graveyard. The bottom stratum of these tombs dated from between 1300 and 800 B.C., and in one was found a warrior who had been buried and was not burned. But at the same level were found a great many other tombs of another character—they were not graves, but pit tombs. About thirty-seven such tombs were excavated, and at the bottom were found enormous jars. Inside the large jar was a smaller jar which contained the ashes of the dead man, and in the large jar also were from nine to thirteen vases containing the remains of food. In some of them the bones were so perfectly preserved that they could be identified as the bones of coats and sheep, and in one were the bones of a fish, which were exactly identical with the bones of a fish now found in the Tiber. The reason why food was buried was doubtful. The general belief was that it was placed there as food for the spirit of the deceased, but it seemed more probable that it was an act of simple sacrifice—the people

sacrificed what they found most difficult to get as an offering to the deceased. The pottery was exceedingly interesting, for it was all made by hand before the introduction into the country of the potter's wheel. Boni took out some clay from the district, and proved that these early people used the clay of this very place. In several of the tombs were found models of huts. They were round, with gabled roofs supported by cross beams with a peculiar little chimney. On the frontier between India and China some years ago she saw huts exactly the same as the models found in the tombs. They found also in the Forum graves of a later date with pottery which was well made. They were tombs of little children, and were about 800 B.C. The lecturer next dealt at some length with the pool of Juturna. She remarked that it had always been the duty of the women to go for water while the men were away fighting, and it was just the same in the Forum. The little group of shrines started with the water-spring of the Pool of Juturna, just at the end of the Palatine. To excavate this Comm. Boni had to dig down about 50 ft. He found many things, but nothing so interesting as this Pool of Juturna. What they saw on the screen was a great oblong basin made of concrete with a base intended for a statue, which only dated from the reign of Augustus. They found another large basin underneath, and underneath again were found traces of a little pool with yellowish sand. There was no doubt that the Romans thought the water of this pool had curative properties, for alongside were a number of little arched chambers which must have been erected for the sick, and there were also fragmentary statues of health-deities. They saw first that the Pool of Juturna was for the water supply for the Palatine women, and then was used as a health place. There had also been found, however, the statue of a horse and two torsos, which undoubtedly referred to the story of Castor and Pollux. When the Tarquins were turned out of Rome by Brutus and his army, they caused to be spread

THE LATYMER FOUNDATION:
HEAD-MASTERS' HOUSE:
THE MALL:
HAMMERSMITH-W:



the legend that Castor and Pollux had helped them to win the battle, and that after they had done so they washed their horses at a well. The well referred to was undoubtedly the Pool of Juturna, and statues of Castor and Pollux were erected just by. Beside that the temple to Castor and Pollux was erected, and the three remaining pillars were the most beautiful thing in the Forum. A few steps away from the pool was found a white marble well-head, but the peculiar thing was that there was no well. It looked down a shaft, and Boni found that it was supplied with water from a little leaden pipe from the Pool of Juturna. It seemed probable that this was to enable the Vestal virgins to obtain their supply of water, which it was their duty to get for all great expiatory sacrifices. The lecturer briefly referred to the remains of the Temple of Vesta, and the House of the Vestal Virgins, which she said must have been an exceedingly beautiful house. Coming to the Regia she (Mrs. Burton Brown) said that the basis of what may have been the sacrum for the sacred spears of Mars was unearthed. The Regia stood by the Via Sacra, and there were still two interesting shrines left. Going towards the Quirinal Hill they found the Comitium, what was the House of Commons of ancient Rome, and the Senate House, or House of Lords, and they discovered last May the Gulf of Curtius. Boni chose the Comitium for excavations, and found twenty-three layers. It was a regular record of Roman life—one floor above another. There were found traces of the Rostra. There was a mass of evidence that in the Comitium near the Rostra was the "black stone." The black stone was a great piece of black marble let into a white marble pavement. Boni shored this up, and got beneath to see what was there, and he found underneath the bases of two statues which might well be those of the lions said to guard the tomb of Romulus. Behind them were two columns, each of which was originally about 5 ft. high, but had been broken off. There was an inscription on one of the stones, but although about 87 papers and books had been written on this inscription, only one word could be made out. It was probably broken by the patricians in their anger against the Plebeians. There were records by Cicero that about the end of the third century B.C. these stones were broken. They were found surrounded with ashes and broken vases, and it was evident that a great sacrifice was made there, and the place burned away, although it was marked by the "black stone." In conclusion, Mrs. Burton Brown showed a number of photographs of the Forum of Cæsar, and of the great system of underground tunnels, by which Julius Cæsar hoped to provide better games for the people. These tunnels were 7 ft. high, and 4 ft. wide, and there were openings to the surface, and lifts were constructed, worked by windlasses, one of which Commendatore Boni found.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to sanction a loan by Hampstead Borough Council of 27,340*l.* for electric light installation, and to lend Mile End Old Town Guardians 1,310*l.* for poor law purposes.

Selected Lists of Contractors.—On the recommendation of the Education Committee, it was agreed that the name of Messrs. Lole & Co., of Trafalgar-square, Chelsea, be added to the selected list of contractors to be invited to tender for structural alterations and repairs to school buildings; and that they be allowed to tender for works to the value of 7,000*l.* That the name of Messrs. Kirk & Randall, of Warren-lane Works, Woolwich, be added to the selected list of contractors to be invited to tender for the erection of new schools and additions to schools. That the name of Mr. A. Fernhead, of No. 354, Caledonian-road, be added to the selected list of contractors to be invited to tender for the electric lighting of L.C.C. schools. That the names of the under-mentioned firms be removed from the selected lists of contractors to be invited to tender for works in connexion with L.C.C. schools:—(i) Mr. J. Watkins, Clapham; (ii) Mr. J. Burrows, Islington; (iii) Mr. T. Nicholson, Scho-square;

and (iv) Messrs. George Williams, Ltd., Holland-park-avenue.

Storm Floodings.—On the recommendation of the Main Drainage Committee, the following recommendations were agreed to:—

(a) That the estimate (No. 4324) of 10,000*l.*, submitted by the Finance Committee, and that expenditure not exceeding 10,000*l.* be sanctioned for the acquisition, in connexion with the scheme of flood relief works, of properties (including the site at Shad Thames) necessary for the erection of pumping-stations and the construction of storm-water outlets.

(b) That, subject to the consent of the Secretary of State to the compulsory acquisition of the property, the site at Shad Thames, Brompton, as shown by red tint and red hatched lines upon the plan presented to the Main Drainage Committee on 12th May, 1904, be approved as a site for the erection of a pumping-station in connexion with the scheme of flood relief works.

(c) That application be made to the Secretary of State for the Home Department for his consent to the compulsory acquisition by the council of such land and property as may be required for the purpose of a site for a pumping-station at Shad Thames; and that before such application is made the solicitor do take the steps prescribed by section 153 of the Act, 18 and 19 Vict., cap. 120.

Sewage of Claybury Asylum.—On the recommendation of the Asylum Committee, it was agreed that the estimate (No. 4342) of 1,150*l.*, submitted by the Finance Committee be approved, and that expenditure not exceeding that amount be authorised for the laying of a drain from the filter beds which deal with the sewage from The Hall, Claybury, to connect with the drainage system of the farm buildings.

Erection of Buildings at the Rear of No. 10, Parson's-green, Fulham.—The Building Act Committee recommended, and it was agreed, that the solicitor do take all necessary steps to obtain the decision of the High Court upon the case stated by the magistrate in the matter of the Council v. Heathman, re the erection of buildings at the rear of No. 10, Parson's-green, Fulham.

Arbitration Case: Hackney-wick to Abbey-mills Relief Sewer.—The Main Drainage Committee recommended, and it was agreed that the estimate of 750*l.*, submitted by the Finance Committee, be approved; that expenditure not exceeding 780*l.* be sanctioned in connexion with the award of the arbitrator and of the costs of and incidental to the arbitration proceedings and to the settlement, in the matter of the claim of Messrs. J. G. Nicholson & Sons in respect of damage to their property at Bromley-by-Bow by reason of the construction of the Hackney-wick to Abbey-mills relief sewer.

Rating of Site Values.—The Local Government Committee reported with reference to the meeting on October 7 last of a municipal conference on the taxation of land values, convened by the Glasgow Corporation, when resolutions were passed in favour of the introduction of legislation on the subject. The committee stated that the Glasgow Corporation had asked whether the Council was prepared to co-operate with the committee of the conference in endeavouring to secure that the principles for which the conference was contending should be placed on the Statute-book. The Local Government Committee were of opinion that the bringing into line of so many provincial authorities was the most important step yet taken towards the rating of site values, and the Council should do what it could to assist the conference in its efforts to bring about this reform of the system of local taxation, which the Council had long advocated. They accordingly recommended:—
"That the Council reaffirms its opinion in favour of the direct rating of site values, and that it be referred to the Parliamentary Committee to approach the members of Parliament representing London constituencies with a view to their balloting for a place next Session for a Bill on the subject of the rating of site values."

Mr. H. P. Harris moved as an amendment that the recommendation be referred back to the committee, with instructions to report upon the reference made to the committee in March, 1902, to report as soon as possible upon the proposals contained in the minority report of the Royal Commission on the Taxation of Site Values, and also to state the general provisions of the Bill which they desired members of Parliament to ballot for.

Mr. Sankey seconded the amendment. On a division the amendment was rejected by eighty-five votes to thirty.

Sir Melville Beachcroft moved the further amendment to leave out all words after "site values."

Mr. E. White seconded the amendment, which was rejected by a large majority. The recommendation of the committee was then adopted without further discussion.

The Council adjourned at 6.30 p.m.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Kensington.—The retention of a one-store addition at the rear of the Stockwell Railway Station, Clapham-road, abutting upon Binfield-road (Mr. W. F. Knight for the City and South London Railway Company).—Consent.

Fulham.—Railway station for the Metropolitan District Railway Company over the railway cutting at the corner of Gliddon-road and Margrave-gardens, Fulham, and to be known as Baron's Court Station (Mr. C. Estall).—Consent.

Kensington, South.—An iron and glass house in front of No. 23, Roland-gardens, Kensington (Mr. W. Willett for Mr. J. B. Ellison).—Consent.

Fulham.—A gas-motor house at Beaufort House School, Lillie-road, Fulham (Mr. T. Bailey for the Education Committee of the Council).—Consent.

Bow and Bromley.—A building on a site abutting upon the eastern side of Wick-lane and northern side of Monier-road, Bow and Bromley (Mr. T. Wilson for J. Chessum & Sons).—Refused.

Hampstead.—Buildings upon a site abutting upon the southern side of Fawley-road and western side of Crediton-road, Hampstead (Messrs. Boehmer & Gibbs for Mr. V. Walker).—Refused.

Islington, North.—Fence walls and gate and an open iron shed at the southern end of Windermere-road, Islington (Mr. J. W. Stevens for Messrs. Knowlton Brothers).—Refused.

Lewisham.—A temporary building on a site on the east side of High-street, Lewisham, northward of No. 203, abutting also upon Court Hill-road (Austin Cycle Company).—Refused.

Space at Rear.

Marylebone, West.—A modification of the provisions of section 41 of the Act, so far relates to the proposed erection of an additional storey to No. 35, Great Cumberland-place, St. Marylebone (Mr. R. G. Hammon for Mr. F. Dugdale).—Consent.

Formation of Streets.

Walworth.—That an order be issued, Messrs. Cluttons, sanctioning the formation or laying out of two streets for foot traffic only to lead from Liverpool-street to Merrett-street, Walworth (for the Ecclesiastical Commissioners).—Consent.

Line of Frontage and Construction.

Islington, North.—A temporary office building at No. 89, Fonthill-road, Islington (Mr. W. Grummit).—Refused.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The third meeting of the session was held at 18, Tufton-street, on the 16th inst., when Mr. W. Curtis Green read the following paper entitled

"The South Kensington Museum for Architects."

The subject of this paper was suggested to me by Mr. Lishman, and I accepted it with preference to unknown dangers. I imagine that if I could skim a few of the most possible subjects the museum offers and give you the cream, the object of the paper would be gained. My inexperience and the vastness of the subject are against such a possibility; but not only so, the museum is principally concerned with the handicrafts with which the craftsmen practising them can adequately deal; just as in architecture only the best can be learned from architects of practical experience. The crafts are, however, organically associated with architecture, and cannot properly be separated from it, and the more we study the better. It would probably be more profitable to begin in the workshop rather than in the museum. In the former we see the practice in the latter only the results, and it is with practice, i.e., the causes of the results, that should be principally concerned. To recognize good from bad in a museum we must understand the methods of the workshop, we must get down to the facts and work if possible among those whose eyes are open to distinguish good from bad, working in the spirit and traditions of those who fashioned the useful and beautiful things of the past. To understand our work is to be in sympathy with the simpler elements of

One reads of Michael Angelo spending years of his life quarrying his own marble—it is doubtful if those years were wasted. Or, again, whether the painter-architect who built the Campanile at Florence was not all the better that he began life as a shepherd? Ploughing, hewing, quarrying, iron smelting, weaving, moulding, all go to make up the complex conditions of modern building, lost sight of perhaps in modern specifications, but a due regard for which is at the root of all great success in building.

I think we must feel our relationship to the past and its workers to kindle the enthusiasm necessary to get us over the difficulties of to-day. Those who have been successful latterly have had this enthusiasm; they have had the genius at the outset of discerning the facts, and having mastered them—questions of design solved themselves—the weaving of fresh inventions became more easy than the revival of any style. They very likely did not feel at home the first time they entered a museum or gallery any more than you or I. Personally I have felt the chaotic sense of impotence in the museum, as in a big library without a librarian. It is only as we are enlightened outside under the sobering influence of technical knowledge that the "little miracles of art" begin to breathe for us. It is easy in the conditions under which we work to make mistakes. We may start with plenty of enthusiasm, but over confident, or unaware of the pitfalls that await us. To have spent hours drawing a subject the art of which at the time was a closed book; to have bought photographs of comparatively worthless objects and come home with copious notes and measurements without having seen the precious things we ought to have seen; to have measured carefully the *only* part of St. Paul's Cathedral not the work of Sir C. Wren—these are humiliating experiences to which I myself must own. Some students are better guided, or naturally do better; they browse in any pasturage, however rich, choosing wisely, referring from the first what they have before them back to their natural elements, or to recognised standards of taste which they have been so fortunate as to imbue from childhood. But there are a great many, perhaps the majority, who emerge from a home happy very likely in everything save in its pictures, furniture, and ideas of art. They have imbibed the current opinion that art is apart from life, an adjunct, a luxury, consisting of churches, pictures, and drawing-room statuary. Study at a museum may be the first corrective they will receive, and they enter it without the knowledge necessary to discriminate between the good and bad work which it holds. A museum represents a great change that has taken place in social life. The machine now rules us, and all that stands in the way of it and of the development of our mechanical faculties is in danger of disappearing. The State has at great expense gathered together the crumbs and fragments of the past that remain, and is engaged at last in properly housing them. It is affectation to rail against the present conditions of society unless we are willing to place ourselves outside its pleasures and conveniences; we cannot get back to the palmy days of mediæval art and romance even were it proved to be desirable. S. Bonaventura, writing in the XIIIth century on the arts, says that "the illumination of mechanical arts is a way to the illumination of sacred Scripture; and there is nothing in them which does not predict and foreshadow the true wisdom." I quote this merely to show that our art is a great enough concern for us for a lifetime, so near is it to the heart of things.

In the museum we see art in the humblest objects and materials. We can trace their relationships, and see that it was this relationship that made it so powerful in the past. It shows a close and healthy connexion with things of common use. There are no boundaries between the so-called "fine arts," the higher mechanical, and the lesser and useful ones. Hand and mind were trained in the same school, under master workmen, having for models contemporary work. Architecture, sculpture, carving, and painting were intimately connected, woven together of necessity and by Nature. As an instance of this, take the east of the monument of Walter Grey from York Minster, in the architectural room. It is a rather ornate work of the XIIIth century. The architecture adequate and refined; the sculpture of the recumbent figure simple and impressive, befitting an effigy neither dead nor sleeping; the carving of the foliage and the birds in the finials is fresh and pleasure-giving, while

touches of quaintness are allowed. There are two French fragments of the same date as the foregoing close by, one a charmingly-treated little Assumption of the Virgin from Notre Dame, the other a retablo from the Church of Saint Germer; each of them show a mastery of design, of figure sculpture, and carving. The easts of the doorways at Norwich and Rochester show the same connexion, and what would the Gothic portals from Amiens and Bordeaux be without their figure sculpture and carving? There is also a fine cast of Nicola Pisano's Pisan pulpit. Born at the beginning of the XIIIth century, it must not be forgotten that he grew up among some of the fine sculptures of the ancients, from which he got his inspiration. Classic as his figure work is, he has been called the founder of Gothic sculpture. Here you have a cast of his most famous work. It does not give the beauty of the material, the granite, jasper, and marble columns, but the sculptures are there, showing his study of classic models, some of the figures being direct copies from the Greek work in the Campo Santo at Pisa. I think it is the lovable humanity in the sculptured work of the XIIIth century that appeals to us. There is more reality about it than in the realism that succeeded it. The symbolism is less crude and mechanical. The later and richer work shows less restraint and less allegory; it fills us at once with a sense of the cleverness of the artist and with wonder at the command he has attained over his tools and material. As the admirer of the Renaissance craftsman said, his production seems "as if it were alive, a marvel too great to be believed." Such an end shows a misunderstanding of the purpose of art, which is not to exalt either the artist or the material into anything marvellous or unnatural. Neither is the artist to be a slave to technical skill and to imitation. You can judge of this by comparing the pediment of the doorway of Milan Cathedral with the work just mentioned. The east of this bangs on the north wall of the architectural east-room. Notice also the fine western portal of S. Sauveur at Aix, in Provence, the doors of which, the work of nearly a century later, very richly carved and sculptured, are treated in a manner much more suitable for bronze casting than for wood. The German work of Adam Kraft in the XVth century is also interesting; it seems to me too pictorial for architectural decoration. His large Sebreyer monument at Nuremberg is a design that would look more suitable executed in tapestry than in marble.

Besides enabling us to compare the characteristics of the different periods and the treatment suitable to different means and materials of expression, the museum gives an insight to any district or country. You can see the peculiarities of the work before visiting it, or remind yourself of the things you have seen on your return. To enter the Italian court is to desire to be in Italy again. It suggests cool white churches and rich colour decoration, sunny piazzas and polished marbles. We are in a new world, the world of the Renaissance. The fancy that inspired what we see is not that of the Gothic period; left behind are the XIIIth and XIVth centuries. What we see now is less lovable and homely, more scholarly, more refined and dignified; more dependent on exact workmanship and on fine materials; more the work of one individual who has coerced others to assist in the expression of ideas too great for them to understand. The architecture of the Renaissance is so dependent on greatness of idea, repetition and symmetry, that these fragments at the museum serve only to show the extraordinary skill and beauty of the workmanship. You can study Italian architecture better upstairs in the library from books and photographs. Here are only incidents; Italian history is the story of the art of the Renaissance. The whole field of art is widened and extended, and its study becomes more complex. Intellect is at work superseding the saintly artists of the XIIIth century. Arnolfo's fine Gothic church of Santa Croce at Florence passes almost unnoticed amidst the later work of the sculptor architects. In the east-room is a copy of the Renaissance pulpit in this church which attracts more notice from visitors than the church itself. It is the work of Benedetto da Miano; it shows the extent to which refinement with strength may be carried, and the attraction of elaboration. The detail is as beautiful as the general outline. The exquisite grace of the tiny statuettes set in their porphyry niches, as

well as the panels illustrating the life of S. Francis, is delightful. The execution of the whole work is carried to the last pitch of perfection, done by a man who began life as an intarsia worker. I speak with knowledge of this pulpit, having spent fifty precious hours at Florence making a drawing of it. Another example of the sculptor-architect's work at the museum is a cast of a window from the Certosa of Pavia. It is noticeable in these buildings that as the figure work improves the carving of the natural objects becomes harder and less free and graceful.

Unfortunately the great master architect, sculptor, engineer, and painter is not properly represented as far as architecture goes. There are no models of the Medici Chapel at Florence except for the statue of the Duke Lorenzo himself. In speaking of Michael Angelo I should refer to Alfred Stevens, so well represented in the museum. We cannot, in my opinion, study two greater masters of classic form applied to modern building. Their work was conceived in the round. With them sculpture and carving was not a thing to be added on afterwards or left out altogether as the funds allowed. When they employed either it was an integral part of the design. Besides the many interesting architectural fragments it is possible to study representative work of most of the great sculptors of the Renaissance. There are copies of the works of Orcagna Donatello, the della Robbia's Ghillerti, and the rest, each of their work distinctive and impressed with their own individuality.

Reverting to the bumber object of this paper, which is an endeavour to show the value of the museum for studying the handicrafts, we naturally turn to carpentry, which is so closely allied to architecture. Furniture, like building, was once intended to serve the everyday uses of common necessity; as this is more generally realised we shall be able to furnish our houses again so that they will be both convenient and interesting. We find very few varieties of furniture in the museum because there were very few different kinds of furniture made in the Middle Ages. The box was the principal item in a room; cupboards, stools or benches there were, but tables and chairs came later, and were something of a luxury. There is, unfortunately, little furniture of the XIIIth century in existence, but we know it was highly and beautifully decorated. The woodwork is simple carpenter's joinery with a character all its own from the straight-forward solution of the difficulties which the carpenter experienced in the course of his work. There are some coloured drawings of furniture of the XIIIth and XIVth centuries in the library, and some interesting reading on the subject in "Furniture and Woodwork," a book published some thirty years ago by Mr. Hungerford Pollen. Professor Lethaby's suggestive essay in the published volume of the Arts and Crafts Society is instructive and inspiring. These are all in the museum library, to which ready access can be got for a trifling sum. Professor Lethaby recommends the study of pictures in old manuscripts if we wish to furnish our rooms properly. I think a right understanding of furniture can only be arrived at by studying the earliest work, before the principles which govern its construction became lost sight of in the complicated work of later centuries. There is a fine collection of chests or boxes in the museum; the earliest are of the XIIIth century—one Italian, one French; the Italian one has a bowed top, the top and front are divided into six panels by thin bands of patterned metal; each panel is decorated with gesso-dunro ornament on alternate red and black backgrounds; the French example is more substantial and less ornate, its decoration consists of handsome wrought-iron scroll work with which the front and sides are well covered. The only English workwork of this date in the museum, besides fragments of carving, is an oak door. It is a lively piece of design worked in the solid in a primitive manner, with charming little beasts and birds and flowers carved with much simple skill. The chests were used for various purposes; they served indifferently as tables or seats; many of them are inlaid on top for chess, the players sitting at and on either end. They were used as portmanteaus when their owners went on their travels, being slung on horses. They were also used to keep the tapestries in which served as wall decorations on state occasions. These were usually of cypress-wood decorated with incised work in

scrolls or geometric patterns; they were not so substantial as the dower chests.

The early chests are dependent both constructively and for their ornament on the branching scrolls of iron work, of which the French example above mentioned is a fine specimen. There are many of these chests still to be seen in country churches. Some of them are very richly carved all over like that at Dersingham, Norfolk, a cast of which is in the English woodwork section; the front has the emblems of the four evangelists and a border of birds and rosettes; this is of the XIVth century. There is in the French section a small chest of this date showing two mounted knights in all the furniture of war, tilting; and there are both English and foreign examples of the fronts of chests carved with a perfect gallery of knights and ladies, showing on one plane the whole story of St. George and the Dragon. Much of this carved work was originally richly coloured. I read in Mr. Pollen's book that Henry III. directed that "the King's great chamber at Westminster be painted a green colour like a curtain, . . . and that the King's little wardrobe should be painted a green colour to imitate a curtain." The wardrobe of those days was a special room fitted with hanging closets for clothes, and for spices, etc. In the XIIIth century chests began to be furnished with panelled wooden backs and arms. Persons of quality used tapestry screens or dorsals at the back and sides to shelter them from draughts. It was this desire to give honour to individuals which created the invention of the separate chair. A survival of the chest and dorsal is still to be seen in village inns in the high-backed and sometimes roofed-in settles. I have just mentioned the introduction of chairs. You will notice in nearly all the early specimens at the Museum the great height of the seats from the floor. Was this to give extra dignity or to keep the sitter's feet above the draughts, etc.? Other early decorations of the chest are more suitable to modern furniture of a simple and serviceable kind than those above mentioned. They consist in emphasising the constructive features, beautiful patterned dove-tailing at the angles, the projecting lid or huck with purlled edges or gouge cuts in patterns or simple diaper work; or instead of being made of six planks of wood the sides and ends are framed and panelled, the framings being elaborately chamfered somewhat like the modern work of a wheelwright. Cupboards were originally panelled closets and sideboards called dressoirs originated the name of cupboard. The lively cupboards were the larders of the Middle Ages; a cloth was laid on the top—probably a coloured one powdered with worked flowers—and narrow shelves rose in steps at the back for keeping the pewter and other serviceable utensils on. The tables at this time were long boards hinged down the centre, laid loosely on folding trestles. There is a late and highly ornamented example of this in the Italian court on the west side, the top and legs being beautifully inlaid in geometric patterns with ivory. Note also the ivory inlay on the chest opposite to it which is of the XVIth century. I refer to the floriated panels which, instead of being a skilled imitation of Nature as in the later work, is rather a successful interpretation of it. All the bedroom furniture of the early period was of panelled wood, linen chests, settles, cupboards, and beds; in the last, printed or tapestried hangings played an important part in the design.

The Italians regarded furniture and woodwork as a fair field for decoration and their genius left its air of distinction upon it. Their work of the XVth century is full of interest as the type of later developments in all countries. The chests of this and the next century are very fine and there is a representative collection at the museum. Some of them are elaborately shaped and gilded, the fronts and ends decorated with gesso-duro showing brightly-coloured pictures of marriage ceremonies and classical stories. This is the sculptor's art of the time of Michael Angelo and Benvenuto Cellini which furnished the gorgeous palaces of Popes and nobles. Scholarship has got the upper hand of the arts of construction, carving, and painting. More beautiful, I am inclined to think, because more useful and less frail, are the exquisite inlays of this period to which I have already alluded. There are quite a number to be seen, showing what an immense output there must have been. Most of the pieces are inlaid marquetry of ivory and coloured woods low and rich in tone, decorated inside

and out, the inside no less beautifully than the out. The inside is fitted with little drawers and pigeon holes for jewels, money, and papers. Other chests of this period are lightly incised with a pattern, the excavated parts being filled with coloured mastics. One of these shows the judgment of Solomon on the front. Others again are quite plain without, like the XIIIth century chests, ornamented with metal work of more elaborate workmanship than the early ones. The metal work consists of very intricately pierced and chased lock plates, hinges within and without, handles at the ends, corner clamps, and bosses which are merely ornamental. In a few cases highly coloured textiles are placed beneath the metal showing through the piercings. The Italians are, however, outdone in richness of effect in this class of decoration by the Spaniards and Portuguese whose work may be seen in the gallery opposite the refreshment rooms. A phase of decoration in which the museum is not so rich is that more elaborate intarsia, inlaying with coloured woods whole pictures of figures and other subjects. There is a marvellous example from Augsburg of the XVIth century which is representative although it was an essentially Italian art. It is to be seen at its best in Bergamo in the decoration of the choir stalls of Sta Maria Maggiore, and at its worst in the late Dutch examples.

I cannot attempt to deal with the well-known periods of English furniture. I am afraid it is a fact that very little furniture was made in this country; most of it came from abroad, at least till after the Wars of the Roses. Later, again, most of the best English furniture, so-called, was made by Dutchmen in England or imported from Holland. And the Huguenots were responsible for a great deal. It is possible, I suppose, that inferior wood and workmanship is not confined alone to our own times, and that only the best has survived to our day. Anyway, it is disappointing that English work is not better represented. It seems to me that the good tradition of early work was more faithfully carried on in this country than any other.

If I may digress, I should like to add that I think it is to the early type that makers of the best modern furniture have turned. It allows more scope for the imagination and less for the machine than the later work of the Renaissance. Good furniture can never be made by machines, human or mechanical, therefore at the present time it cannot be procured at shops; one has to find individual craftsmen who make it themselves and treat them as we would that our clients would treat us. That is to say, they must not be asked to do impossibilities. Woods and their natures, and even the stock which they may have seasoned and in hand, must influence their work more than we may suppose. The labour of a thoughtful man following his craft is of much more value than of the artisan working from a drawing which we have made ourselves. We may conceive the furniture for the room, but intimate co-operation is necessary to bring it to a successful issue. The beautiful furniture now being made retains the simplicity that characterises all good work, often showing great ingenuity of construction and sometimes very elaborately decorated inlays or paintings. The experiments of William Burgess, Wm. Morris, Burne Jones, and Maddox Brown are bearing fruit, I believe, in a school of English furniture founded in reason and good workmanship.

No part of the museum is more interesting to me in itself than the ironwork gallery. There is so much variety; its contents show such a fascinating combination of simple ingenuity and intricate design. Where else can you see such door handles and knockers? or such locks and keys? so much mechanical skill allied to beauty of form and finish? The simplest rushlight-holder stuck in a log of wood is something more than a curiosity. Candlesticks in every form abound; really useful things down to great architectural corona and candelabra in the court below; German and Byzantine work of the XVth century; Italian Gothic of the XIIIth, and Renaissance of the XVth and XVIth centuries; window gratings and balconies; fire backs and fire dogs and irons, black or polished; hour glasses and vases painted in gay colours. Smiths' work in all its branches is interesting, especially applied to architecture. To have seen casting, puddling, and welding, is to ever afterwards have an interest in the material; to recognise its fitness in certain positions and in certain forms. Ironwork forms so important a part in

building it is a pity it is not more studied if it were, what still exists of the XVIIth century would be more valued and cared for. The lamp standards on Waterloo Bridge would not have disappeared and gas and electric standards would not be of the ugly and suitable type to which we are accustomed.

I suppose it is impossible for a mere man to know anything about the practical side of embroidery and needlework. Nevertheless, I think the English architect has a natural aptitude for the more homely arts. A chair covering, carpet, or the tiles on a hearth mean more to him than, for instance, such small things do to a Frenchman. As a friend said to me the other day, "abroad they have no fires, architecture," asking why? he replied, "because they have no fires!" And it is no doubt true that what we lack of continuity, orderliness and stately architectural effect our streets, we endeavour to make up for by comfortable homeliness in our houses. I do say that this is the better way, but it certainly adds to the pleasures of life to form a taste for the lesser arts. There is no more accessible place in London for the study of colour than the museum among the relics of the great times, early weaving embroidery and appliqué work. Not only should we find the gems of the Middle Ages and of the later work of the Huguenots both akin to our instincts and traditions, there is the richness of the East in Indian and Persian work. The beauty of the East work does not invite competition or imitation but it lets us into many secrets of colour, beauty of elaboration when all is fresh and inspired, and the value of patience in any work of art. Here, as in any other study we undertake at the museum, we shall be forced to the conclusion that the machine is impossible as a creator. No machine could have done these things, nor any man working as a machine. Such a person works against time, whose endeavour is to obliterate the gradations of texture of hand work done from day to day.

The mere fact of hand weaving being not so common a practice as to be almost though happily not quite extinct, tempts the architect into designing his own hangings and church furnishings. When this is necessary, it is the type that matters. Often the result is a dead-alive exercise in some "style" lacking the charm and the spontaneity of the Raphaelite work and the beauty of colour and texture of the more staid and scholarly work of the XVth, XVIIth, and XVIIIth centuries. The design is too often executed by machine or by ladies, accomplished in all the resources of stitchery, with machine-like accuracy.

We can become accustomed to good combinations of colour in the Italian Court and the majolica. In the Eastern Section among coloured tiles the pottery, china, and porcelain I think, too, the water-colour rooms have value for architects. The drawings of P. Roberts, Cattermole, Turner, and Hunt have something more than the architectural draughtsmanship of the present day. No representation of architecture seems to me complete without its colour and texture; any other kind of drawing is a make-shift, and as a rule a photograph preferable.

In one of the windows in the museum the Professor Moody has put a fine quotation which I must close. "The wisdom of a learned man cometh by opportunity—How can wisdom that holdeth the plough?—He giveth his mind to make furrows and is diligent to feed the kine fodder. So every carpenter and master that laboureth night and day; and the that cut and grave seals; the smith also sitteth by the anvil, and considering the iron work. The potter sitting at his work and turning wheel about with his feet, who is always careful to set at his work.—He fashioneth the clay with his arm and boweth down his strength before feet.—All these trust to their hands: With them cannot a city be inhabited: They shall not be sought for in public counsel, nor sit in the congregation: They shall not sit on the judges seat nor understand the sentence judgment:—and they shall not be found with parables are spoken.—But they will maintain the state of the world and all their desire is the work of their craft." I have taken up much of your time and leave the mass of subject to you untouched upon."

Mr. W. A. Forsyth, who opened the discussion said he was in agreement with Mr. Curtis G. The subject was a welcome one, and should lead to a better understanding of the pur-

of an architectural museum, and to a more suitable direction of its study. He apprehended that the subject was treated from the educational point of view, and it must be admitted that the South Kensington Museum formed an essential part of an architect's training. Mr. Curtis Green had said that only present day craftsmen could thoroughly understand the objects at South Kensington Museum, but he did not suggest how the many hundreds who were not craftsmen might best benefit by their study. Furthermore, as their study was surely to be taken on the comparative basis, there was, he thought, much to be wished for in the fuller explanation of the exhibits, and suggested as an instance the desirability of appending sales to photographs, sketches, etc., with notes of the history and sociology, together with a list of reference works and information where such could be found. In this way the telligent grasp of the subject would be facilitated and help to kindle that enthusiasm Mr. Curtis Green spoke of. In regard to that gentleman's remark "that hand and mind are trained in the same school under master workmen having for models contemporary work," this was, the speaker thought, sound and applicable to-day as it ever was, and the South Kensington Museum had, he ventured to think, acted wisely in its selection of modern work. He thought that the limited extent of the British examples formed one of the weak spots in this museum, and noted that there were no examples of such typical works as mediæval stone vaulting, colour decoration, flint, or plaster work, and apart from these such a national craft as Sheffield plate as represented by but one single case. He had always found this building trying from the "headache" point of view, and attributed it a great measure to the unsatisfactory nature of the light, especially at night, and he thought the open courtyards and exterior spaces might with advantage be used for exhibition purposes. He agreed with Mr. Curtis Green in advocating the study of early forms in furniture, and referred to the specimens of modern work on show at the last Architectural Association Innersession by Messrs. Bransley and Ineson as showing the advantage of such study. He thought the two panelled rooms in the South Kensington Museum were very valuable because being a "complete" idea of English decoration in furniture in earlier times. The objection to machine-made articles was, he thought, not within certain limits. In concluding he liked to paraphrase Mr. Curtis Green's statement and make it read thus: "To understand the simpler elements is to be in sympathy with our work."

Mr. F. Lishman thought that the smaller objects might be studied to better advantage on the larger, being more self-contained, and depending less upon their setting and surroundings. Some of the Italian and French mediæval "ivories" were instances in this connection, and examples from other sections of the museum also touched upon, with special reference to their colour and decorative—even neutral—suggestiveness for work on a large scale, whether secular or ecclesiastical. A satisfactory study of the ironwork on exhibition was possible, owing to the extremely bad lighting of the galleries where it is nominally on view. The Indian and Eastern sections deserved to be better known, for their contents offered a rich field for study.

Mr. T. Ryfe, in a brief speech, spoke of the comparison between a museum, and a library without a librarian, referred to by Mr. Ineson. Regarding the casts in this building, he sought a knowledge of the materials forming the original from which casts were taken was essential, otherwise they might prove a source of deception. It was, he thought, a good thing to guess at the materials first and afterwards prove or disprove these by making inquiries. He considered that some of the exhibits in the present building—for example, the Byzantine bronzes, could not properly be seen; and hoped that this might receive attention in Sir Aston Webb's new building.

Mr. A. H. Belcher said he knew very little of the South Kensington Museum, and regretted he trusted that Mr. Curtis Green's paper could be printed, for it was by open discussion in the public press that a great many desired improvements were effected with satisfaction at all parties.

Mr. H. Gregory Collins (chairman), on behalf of the meeting, expressed his gratitude to Mr. Curtis Green for his paper, especially the

practical side. Personally, he was not quite in agreement with Mr. Curtis Green as to the necessity of technical knowledge, for the museum had distinctly another side to it, and that was with regard to inspiration. He regretted the paucity of English work, although the beautiful examples of French must, he thought, be regarded as in some measure making up for this defect. The study of the gradual change from French Gothic to Renaissance was a matter of great interest to him, and doubtless many others. In concluding, he much appreciated the paper as being so exhaustive, a view fully shared by those present.

Mr. W. R. Lethaby, as Special Visitor, then summed up the discussion.

He prefaced his remarks by saying he held no brief for the South Kensington Museum, though possibly he had received more kindness at their hands than the usual visitor, but this was due to the frequency of his visits, he felt sure, more than anything else. At one of the late Mr. William Morris's lectures he remembered him saying that the South Kensington Museum had been built for him (Mr. Morris) and this remark showed the measure of his appreciation of the museum as a factor for education and inspiration. The speaker congratulated Mr. Curtis Green on the nice spirit and good taste displayed in his written paper, the reading of which had given much pleasure to him. He advocated the careful study of old manuscript pictures as tending to a better understanding of the principles underlying the design of old furniture, a study well worth while even though it were not undertaken with the view of immediate design for practical purposes. Mr. Lethaby said that he had known the South Kensington Museum for twenty-five years and had come to the conclusion that by a careful selection by one competent to judge, such an one might derive almost as much good from a tour of this building as by an actual tour in the country from which the examples came. A matter which had recently impressed him was the considerable number of mediæval sculptures in the museum. The point he most desired to emphasise was the need of concentration of which the late Mr. William Morris formed a conspicuous example. This master of crafts got his works up, so to speak, in passions, the last six or seven years of his life being concentrated upon printing, and to this end he exhausted every source of information and suggestion. Mr. Morris's life, as evidenced by the number and variety of his works, seemed to consist of, figuratively speaking, a series of giant-like gulps, each taking from four to six years. The whole of these times being given up entirely to the utmost concentration upon the particular craft in hand. The speaker urged the necessity of such concentration as leading to results which work based on a general scale fails to secure. He believed in the use of a museum for stimulating "our sense" of beauty, but old buildings he regarded as the best possible means of inspiration. He believed in no system that had for its object the "teaching" of beauty, that in his opinion, was impossible; what could be done, however, was to teach subjects and matters which would lead up to an appreciation and understanding of beauty and after that leave the rest to spontaneity. A matter of great regret to him was the sad waste of energy occasioned by the making of individual sketches based upon no organised system, and he thought there was great need of some such system being inaugurated, having for its object the collection, classifying, filing for reference, and such like of sketches, measured drawings, etc., as was done in certain departments in the British Museum. The Architectural Association *Sketch Book* had in this way done a great work for two generations, and he quoted it as an example of successful effort to a definite end. He would suggest that the Architectural Association might, seeing what fine new premises they now had, consider the matter. Perhaps the best advice he could offer those present was to look at things frankly and simply with "our own eyes," and not go to a museum with preconceived notions, as that was fatal to a proper appreciation of the contents of such a building. Lastly, he wished to say that the want of appreciation of a museum should not be a source of contention provided the person or persons concerned had an honest enthusiasm for something else. There must be a practical side to the community, and there was no doubt that too great an interest in ancient works tends to militate from success in more practical art for to-day.

Mr. Curtis Green briefly replied, and the meeting terminated with a hearty vote of thanks to him and the Special Visitor.

ARCHITECTURAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—At an ordinary meeting of the Architectural Association, held in the Rooms on Wednesday, the 16th inst., Mr. J. J. Gillespie, delegate from the Edinburgh Architectural Association, read a paper, illustrated by drawings and lantern-slides, descriptive of English towers and spires. Mr. Gillespie went closely into detail and sub-division, illustrating central and western towers of Norman Transitional and Gothic work, and similarly towers with spires and lanterns. It was announced that the next paper would be given on December 16 by Mr. Bromhead, on "Registration of Architects."

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the opening meeting of the Leeds and Yorkshire Architectural Society, at the Queen's Hotel, Leeds, on Thursday evening, the 17th inst., the President, Mr. C. Bertram Bulmer, in the course of his address, had some interesting and critical comments to make on Leeds architecture. Mr. Vickers Edwards, in proposing a vote of thanks to the President for his address, expressed the view that the Leeds New Markets might have been erected for less money, with due regard to the interests of the ratepayers. He thought that every man who entered upon the noble profession of an architect should be registered. Mr. W. H. Thorpe, of Leeds, in seconding the motion, mentioned that he was an old member of the Society, and had served on its Council for twenty-eight years. He praised the good work being done for architecture by the Leeds School of Art, and commented upon the excellent positions gained by the Leeds candidates in the professional examinations. In passing, too, he had a good word for the Leeds Arts' Club. Earlier in the evening the President distributed a series of prizes competed for by associates of the Society. Mr. Ralph Thorpe was awarded a silver medal and 5*l.* for some measured drawings of Hemingborough Church, near Selby. A prize for drawings, showing the construction of an entrance hall and staircase, was won by Mr. Martin S. Briggs. Prizes for design were awarded to Mr. Godfrey L. Clark (first), and Mr. J. Crust (second); and prizes for sketching were given to Mr. Martin S. Briggs and Mr. S. R. Wyvill (extra). The prize work was on view at the meeting. As usual, the annual meeting partook of a social character.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The session 1904-5 was opened on the 15th inst., at 32, Sackville-street, Piccadilly, the President, Mr. R. E. Leader, in the chair. A lecture was given by Mr. John Garstang on the Roman fort at Brough, and the results of recent excavations on the site. The lecture was illustrated by a large number of photographic views and plans exhibited by lantern light. The Roman fort at Brough, said the lecturer, was a unit in the general scheme of defence in the north and west of Britain, which belongs, in the main, to the early and middle Iron century. One well-defined Roman road joins ancient Brough with the Roman sites at Buxton (Agna) to the south, and Dinting (Melandra Castle) to the north. The Roman fort (castellum) and the Roman camp (castra) are not to be confounded, although there are points of resemblance between them sufficient to warrant a conjecture that both were based upon a common general plan. Both were regular four-sided enclosures with gates and ways and buildings always symmetrically placed. But the camp, whether of a temporary nature, an earthwork thrown up on the march, destined, perhaps, to be evacuated after a single night, or a permanent fortress, was in either case planned for a large number of troops, a whole legion or more, and consequently covered many acres of ground. The Roman fort, on the contrary, was definitely small and strong, the permanent quarters of a garrison. Its area was commonly four to six acres; in some cases it might be so small as three or so large as eight. The number of soldiers who might be quartered within it is not known, and necessarily varied in different places; but, judging from inscriptions, a cohort

of auxiliaries would commonly constitute the garrison. Mr. Garstang then proceeded to describe the general aspect and purpose of a Roman fort, together with the interior buildings, so far as their uses are at present known. It is hoped the excavations recently undertaken at Brough may result in clearing away the uncertainty which exists as to the use of certain of these buildings—such as the large building usually found about the centre of the enclosure, generally called the Prætorium. The fort at Brough was one of the smaller forts, and is situated a short distance from Hope station on the Dore and Chinley line through Derbyshire. The excavations made for the Derbyshire Archaeological and Natural History Society in August, 1903, were of a preliminary character, but, they have, nevertheless, revealed some very interesting features, which prove the plan of the fort to be nearly a regular four-sided and walled enclosure with rounded angles, and, seemingly, a gateway about the middle of each side. One feature of particular interest disclosed was an underground chamber about 8 ft. long by 5 ft. wide at its narrower end, but about 7 ft. wide at the opposite end. This chamber showed unmistakable evidence of having been altered at a period subsequent to its first formation, the upper part of the wall at the narrower end having been cut away to insert a flight of steps, which, about half the height from the bottom, are built up against the wall, and are formed of the stones taken out of the upper part. A very interesting and important discovery was made during the excavation of this pit, or chamber, in the shape of an inscribed tablet. Although the tablet was in four fragmentary parts they practically presented the whole of the essential part of the text, which Mr. F. Haverfield renders as under:—"In honour of the Emperor Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his country (erected by) the First Cohort of Aquitanians, under Julius Verus, Governor of Britain, and under the direct orders of Capitonius Fusus, prefect of the cohort." Only a few days before these fragments were unearthed an inscription of Antoninus Pius was found in the river Tyne,

at Newcastle, which also bears the name of Julius Verus. The discovery is the more valuable because hitherto Verus had not been known to have governed Britain. The photographic illustrations and the capital perspective and "bird's-eye" views, showing presumed restoration of Roman forts, gateways, and bastions, prepared from authentic details, enhanced the interest of the lecture. Dr. Birch, Mr. Forster, Mr. Emanuel Green, Mr. Gould, Mr. Kershaw, and others, took part in the discussion which followed.

Illustrations.

THE CARTWRIGHT MEMORIAL HALL, BRADFORD.

WE published a few weeks ago an illustration of what may be called a corner of this building, a portion of it shown in a drawing that had been exhibited at the Royal Academy.

We give now a plan of the building and a view of it as a whole, as well as a view from one end showing the side of the porch and loggia over it, and an interior view showing the main staircase.

The building was the subject of a competition which attracted a good deal of interest, and in which the design of Messrs. Simpson & Milner Allen, now carried out, was selected. The Hall was to be, as our readers may remember, a memorial museum and art-gallery; forming a monument to Cartwright, an eminent Bradford manufacturer who had been a benefactor to the city.

NEW ORGAN AND CHANCEL, KINGS WEIGH HOUSE CHURCH.

The present structure, built about fourteen years ago from the designs of Mr. Alfred Waterhouse,* is an oval building, with an iron and plastered ceiling domed up to the central oval ventilator. The gallery, which ran right round, stopped against the old organ

* An exterior view of the church was published in our issue of January 18, 1890.

case, which occupied the end wall-space. The design of the upper wall, above the gallery, was based on a system of niches alternating with windows.

In forming the new chancel the three niches were opened up, and a new wall came straight across, faced with terra cotta, and pierced with three windows corresponding to the opened niches, was built as a chancel end.

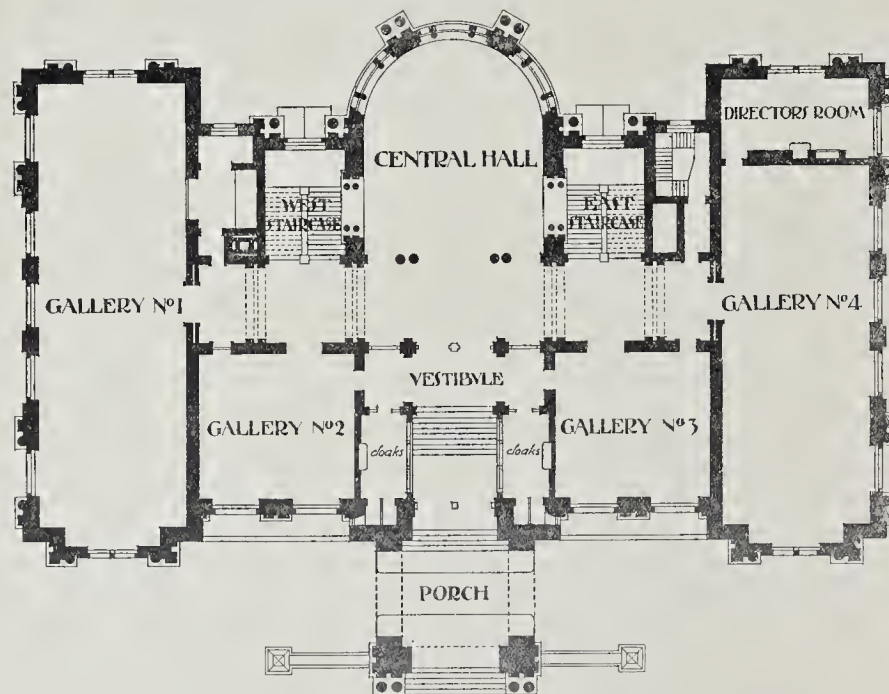
Part of the existing gallery was cut away on each side, and the new organ case, in two positions, was erected so as to form a chancel enclosure. The strong enclosing line of terra-cotta chancel end, and the projecting cornice over, were designed to emphasise the square form of the chancel.

Some slight alterations were effected in the pulpit, a reading-desk, and choir seats placed at the sides of the chancel, in front of the organ case. Seats for the minister and organ case were placed against the end wall, behind the Communion table; and above the space was 1 ft. for a hanging, or tapstry. The scale of the woodwork detail has been kept as far as possible in harmony with the present existing.

A niche for a font was formed in front of the left-hand organ case, and the base of this well as the pulpit base, the reading-desk, and the floor and steps of the chancel up to the choir seats, was finished with marble of various kinds.

The new organ case and all other new work was executed in Austrian wainscot oak. The contractors for the entire work were Messrs. John Shillitoe & Son. The sub-contractors were as follows:—Terra-cotta work, Messrs. Burmantofts (Leeds Fireclay Co.); masonry, Messrs. Galbraith & Winton (Glasgow); electric lighting and pendants, Messrs. Thomson, Ritchie, & Co.; heating and ventilation, Messrs. G. F. Haden & Son; upholstery, Mr. Thomas Hall.

The organ is by Messrs. Henry Willis & Sons. Mr. R. Anning Bell designed the stained glass windows of the chancel end, and they were executed under his supervision by Mr. Arthur J. Dix. Mr. John J. Burnet, A.R.S.A., is the architect.



GROUNDP PLAN

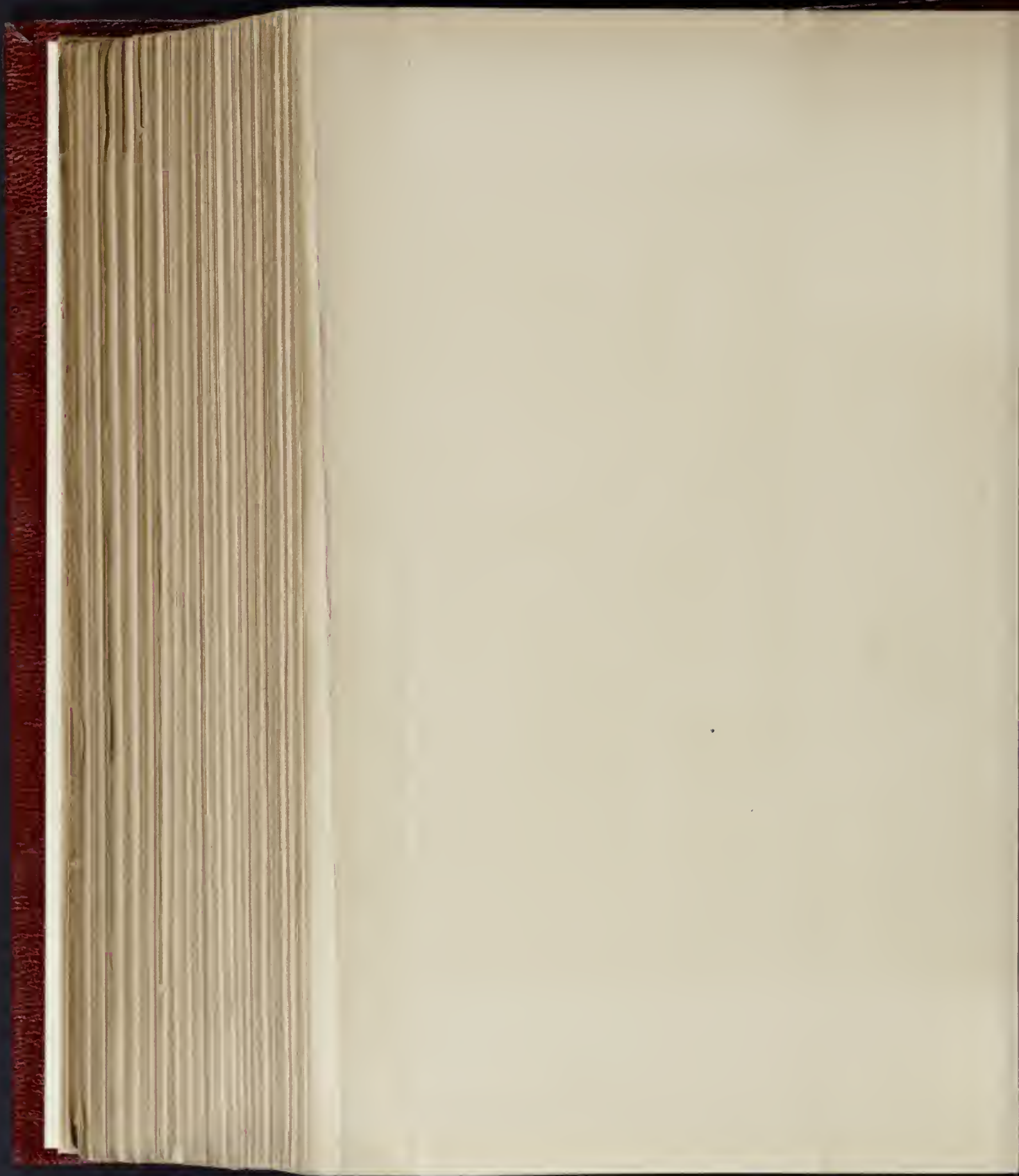
Cartwright Memorial Hall, Bradford.



PHOTOGRAPHED BY SIDFORD LEMER & CO. 147, STRAND, W.C.

1888 PHOTO SPRAGUE & CO. 17, 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

CARTWRIGHT MEMORIAL HALL, BRADFORD—MESSRS. J. W. SIMPSON & E. M. ALLEN, ARCHITECTS
GENERAL VIEW.





VIEW FROM END.

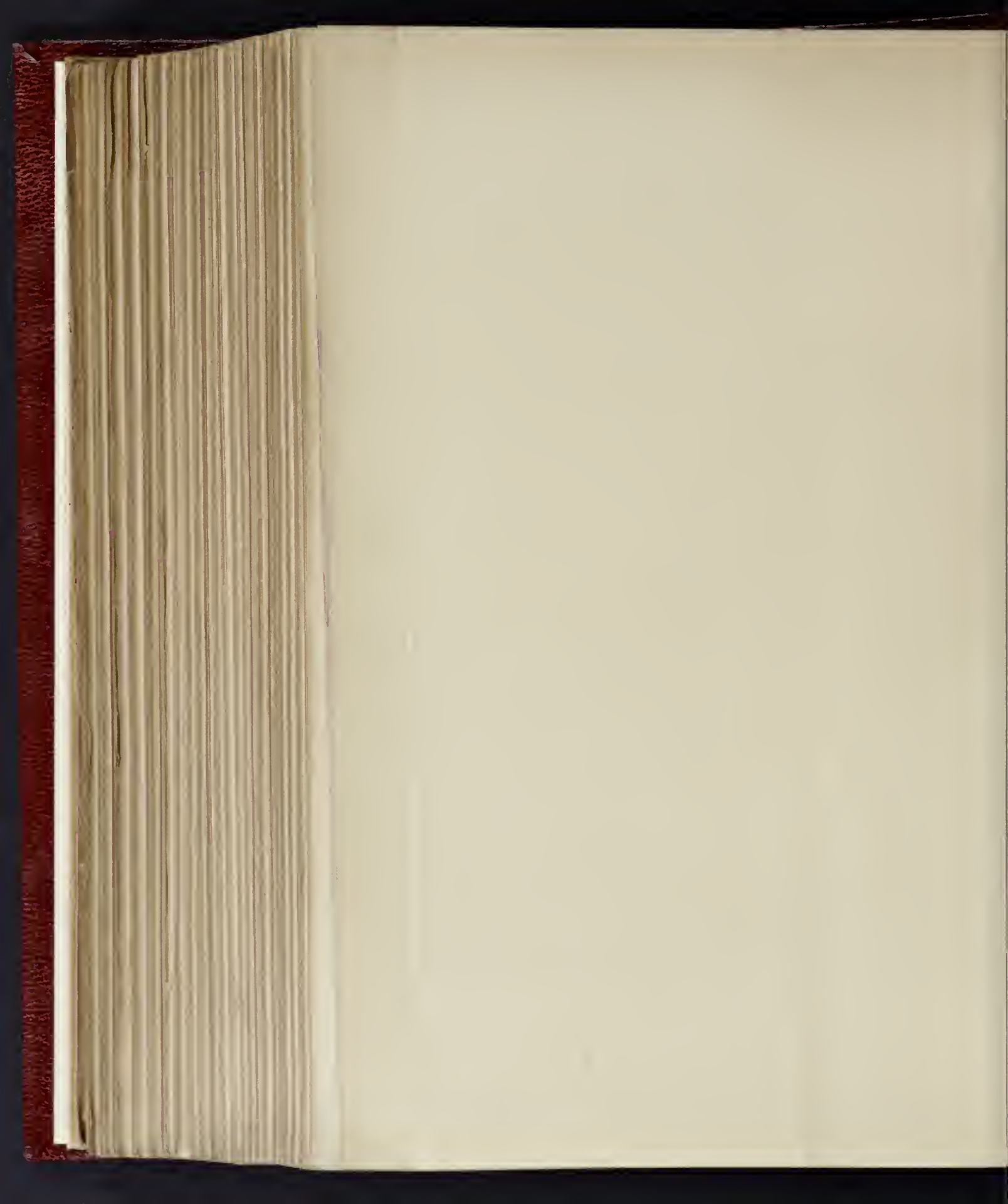


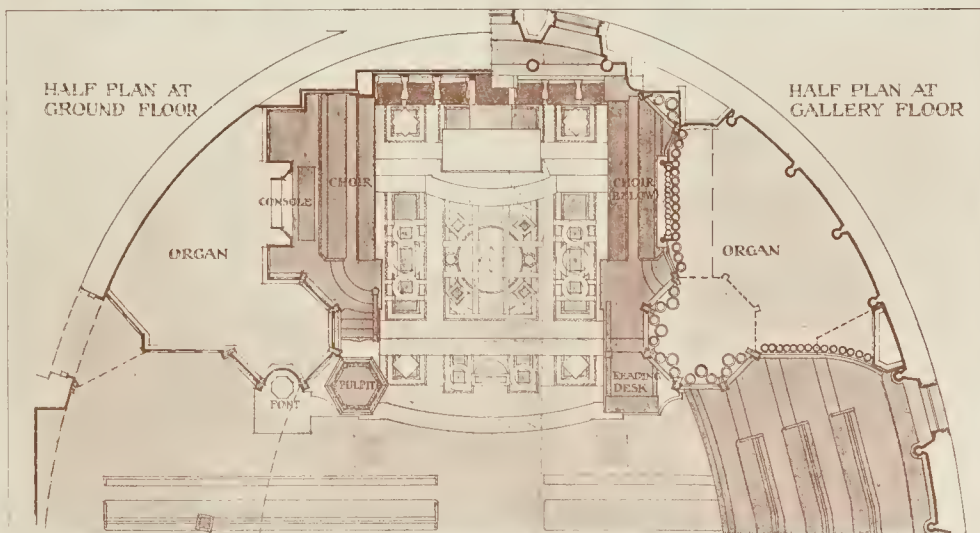
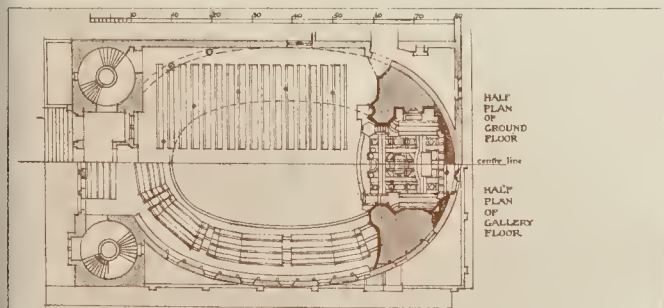
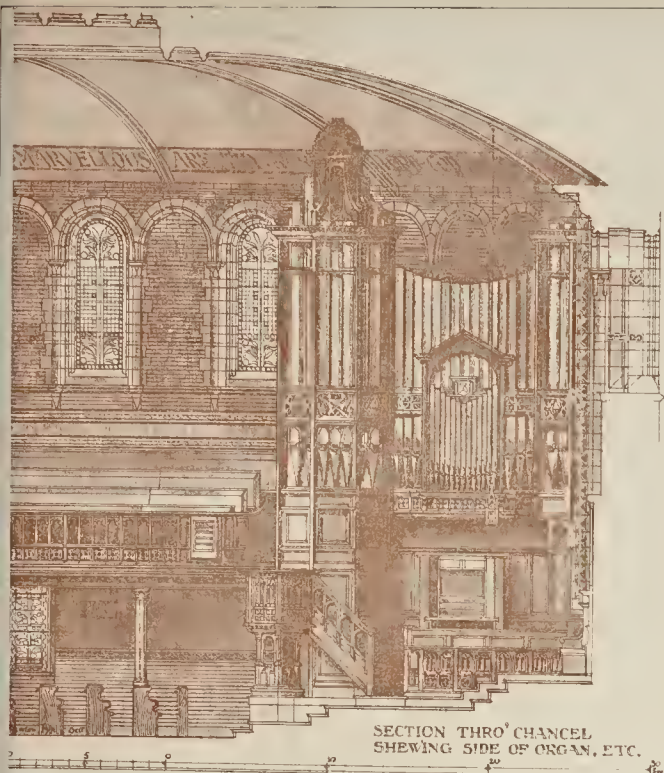
VIEW OF STAIRCASE.

CARTWRIGHT MEMORIAL HALL, BRADFORD—MESSRS J. W. SIMPSON & E. M. ALLEN, ARCHITECTS

DESIGNED BY BEDFORD LEMERE & CO. (INC.) STRAND W.C.

PHOTOGRAPHED BY SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE E.C.



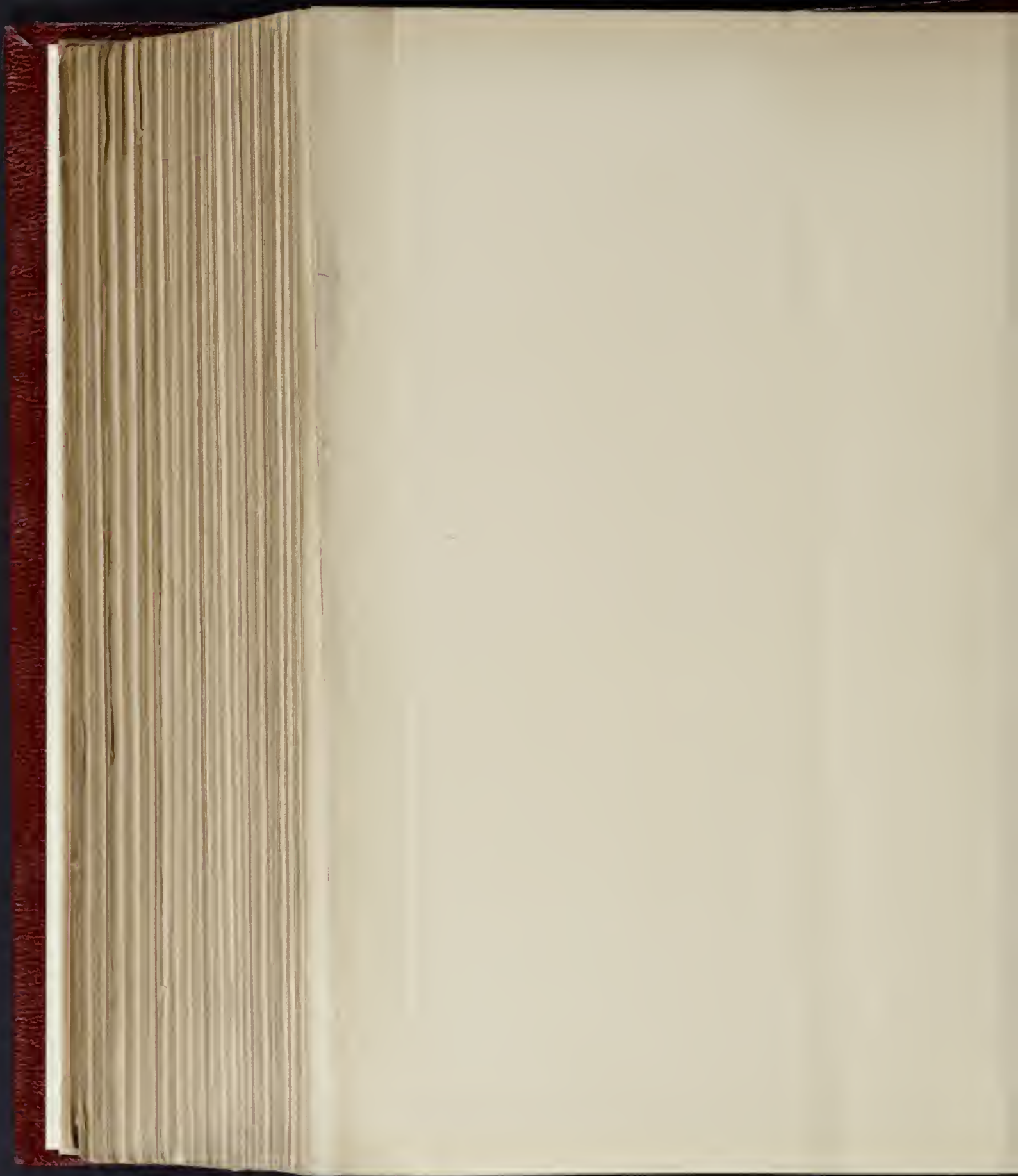


KINGS WEIGH HOUSE CHURCH
DUKE STREET, GROSVENOR SQUARE · W ·

NEW ORGAN AND CHANCEL

Wm. Sumner ARSA
Architect.

STAINED GLASS,
(EXCEPTED), AND
TAPESTRY, DESIGNED
BY R. ANNING BELL





1.



3.



2.



5.

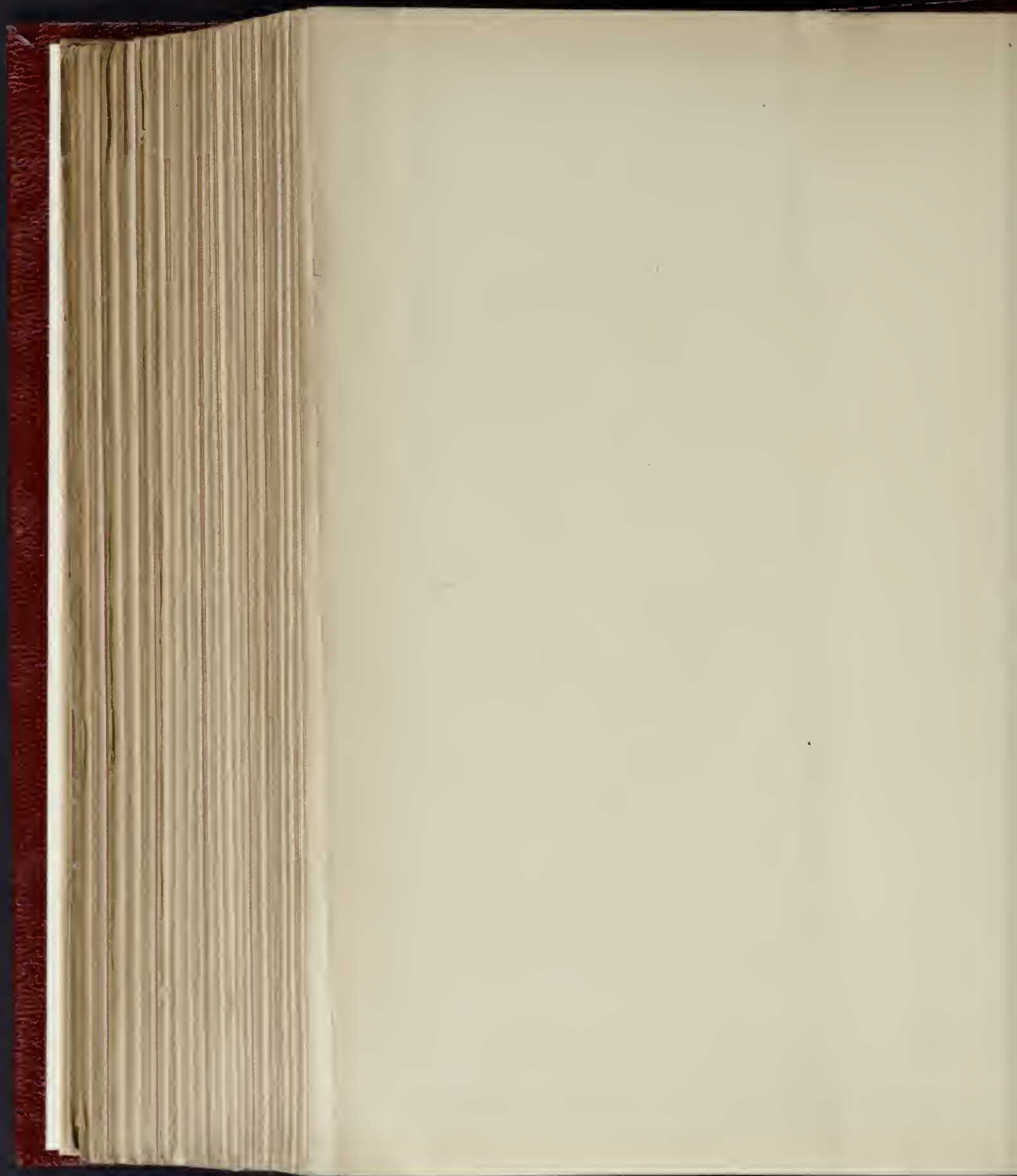


4.



6.

7.



WOOD CARVING BY STUDENTS OF THE ROYAL COLLEGE OF ART.

This illustration shows some of the work done by students of the Royal College of Art, and recently exhibited at South Kensington. Each of the panels are, in their way, fine examples of carving in wood; there is no straining after originality in design, but each student has attained freshness and sound decorative feeling. The hunting scene shows movement and rhythm; we like, too, the rendering of the bear at the mouth of the cave; the armorial panel is not quite finished; the mantling in this, and the foliage in the pilasters, is vigorously treated, showing far more life than we are accustomed to in work of this class nowadays. The horizontal panel also shows the result of thoroughly good training in rendering in conventional and suitable ways natural objects.

No. 1 panel is by Mr. A. E. Payne; No. 2, by Mr. E. Walker; No. 3, by Mr. J. H. Morton; No. 4, by Mr. W. Wetherell; No. 5, by Mr. W. Vetherell; No. 6, by Mr. A. H. Livens; No. 7, by Mr. J. H. Morton.

COMPETITIONS.

CARNEGIE TECHNICAL SCHOOLS COMPETITION.—We have received the programme, which forms almost a hook, of the competition (which has just been decided) for the selection of an architect for the Carnegie Technical Schools, to be erected at Pittsburgh, Pennsylvania, U.S.A. The scheme is an immense one, dealing with a site of the area of 32 acres, though of course a large portion of this land will not be actually built upon. Trustees of the scheme were appointed, who in turn appointed a Committee to carry out the architectural competition. The general features of the scheme may be best explained by the following extracts from the Programme:—

"For the purpose of selecting an architect the Committee have established this competition, and have engaged Professor Warren P. Laird, of the University of Pennsylvania, as their adviser in the preparation of its programme and the making of the awards. Five architects and architectural firms have accepted an invitation of the Committee to submit designs in a competition, for which service they will be paid 100 dollars each. They are Messrs. Carrere & Hastings, New York; Frank Miles Day & Brother, Philadelphia; Mr. Cass Gilbert, New York; Howells & Stokes, New York; Mr. George B. Post, New York.

The competition will be open also to all other architects whose experience and capacity in the design and execution of large work may warrant the Committee extending to them an invitation to take part. Architects desiring to enter are therefore requested to provide the Committee with information as to their professional rank upon blanks to be had upon application to the architect, Arthur A. Hamerslagh, 313, Sixth-avenue, New York, N.Y.

Also all other communications relating to the competition are to be addressed to the Director as above. The competition will be restricted to invited architects, selected as above.

Twenty-five 1,000 dollars each are offered to competitors, other than those who are named above, and the highest in merit, one of these five being assured may extend to Allegheny (see) County architects. These awards will be paid as hereinafter provided.

The prize of the competition will be the commission to design and supervise the erection of the buildings intended for portions of the County architects, and of other buildings, as hereinafter stated, and this prize will be awarded to the author of the design premiated, as hereafter provided.

The required buildings may be broadly classified by arguments, as follows:—
I. Administration.
II. School of Applied Science.
III. School for Apprentices and Journeymen.
IV. Technical School for Women.
V. School of Applied Design.
VI. Service.

The order in which these departments are named has been adopted only for convenience in designation, each will be known by its number, as a 'Group,' and one or more buildings are required for it."

The competition has been won by Messrs. Hornbostel of New York, the second being going to Mr. George B. Post, one of the specially invited and paid competitors; and third, fourth, and fifth places, each conveying an award of 1,000 dollars, to Messrs. Wood, and Deming with Corbett & Pell Assoc. (Washington and New York); Gram, Odine, & Ferguson (Boston and New York); Newman & Harris (Philadelphia), respectively. The highest rank among Allegheny* Architects, to whom was assured an award of 1,000 dollars, was taken by Mr. T. Billquist of Pittsburgh.

BURGH, GLASGOW.—Mr. John McIntyre, of

In the second communication we received, this is again spelt "Allegheny." Whether this is a clerical error or a new spelling, we cannot say. It is "Allegheny" in our atlas.—Ed.

8, Brunton Place, Edinburgh, has been awarded the first premium for his design of the new St. Paul's Church, Glasgow, which is to be erected in John-street, with frontages to Little Hamilton-street and Margaret-street.

BOOKS RECEIVED.

PORTLAND CEMENT FOR USERS. By the late Henry Faija. Fifth edition, revised by D. B. Btler. (Cassell Lockwood & Son. 3s.)

PICTURESQUE MIDDLESEX. By Duncan Moul and R. H. Ernest Hill. (F. E. Robinson & Co. 6s.)

CITY DEVELOPMENT: A STUDY OF PARKS, GARDENS, AND CULTURE-INSTITUTES. By Patrick Geddes. (Giles & Co., Edinburgh; and the St. George Press, Birmingham.)

CASSILL'S CYCLOPEDIA OF MECHANICS. Edited by Paul N. Haslock. Fourth series. (Cassell & Co., Ltd. 7s. 6l.)

A SYNOPSIS MONOGRAPH OF THE ABBEY OF FEGAMP. By J. Atwood Slater. (Sprague & Co.)

Correspondence.

ST. MATTHEW'S, FRIDAY-STREET.

SIR,—You may like to supplement your notes, in your issue of the 12th inst. (page 483), on the subject of St. Matthew's Church, Friday-street, E.C., by the following facts:—

A block of commercial buildings was erected upon the site in 1886, from my designs, when I introduced a portrait of Wren into the carving over the porch, and had the following inscription cut upon the south flank wall of the new building:

"THE SITE OF THESE BUILDINGS WAS FORMERLY OCCUPIED BY THE PARISH CHURCH OF ST. MATTHEW, FRIDAY-STREET, FOUNDED BEFORE THE YEAR 1322, DESTROYED BY THE FIRE OF LONDON 1666, REBUILT BY SIR CHRISTOPHER WREN, AND TAKEN DOWN IN 1885, WHEN THE PARISH WAS UNIED WITH THAT OF ST. VEDAST, FOSTER-LANE."
DELISSA JOSEPH.

THE JOINERY TRADE.

SIR,—I think the present state of depression in the joinery department of the building trade calls for some movement to alleviate the distress through lack of work. Why is it that so many hundreds of thousands of pounds are spent annually on the imported foreign rubbish, wrongly named joinery, when an infinitely superior article, worthy of the name, can be made here in "England" quite as cheaply? I have done it over and over again. The joiner of these days is not the man of thirty or thirty-five years ago, when he was, if not bitterly opposed to, at least exceedingly suspicious of, machinery; he now recognises it as a power come to stay, and to make further progress yet, and is willing to follow it up; in fact, he cannot help himself if his work is properly put to him. Were our builders to utilise their machinery to its full capacity, and by up-to-date methods, I am certain from long experience that this foreign stuff would, ere long, become as extinct as the dodo.

Neither would the builder be disposed to put his work out to some trade joinery works, but put the profits into his own pocket. I have had a very intimate connexion with several of these joinery works, and in the majority of cases, the work is rushed along at fever heat. Client after client clamouring for their goods, this job is put aside to push that, and that to push another, causing, in numerous instances, mistakes and an appalling waste of both labour and material; and, excepting in a few instances I could mention, the work is done piecemeal, underpaid, or by young and inexperienced hands, scamped to an alarming degree, oftentimes (as I have known) to be condemned by the architect or clerk of works. In a well-ordered builder's shop and mill these things could not occur; and, as before observed, if a thoroughly up-to-date method is adopted, and the machinery impressed for all it is capable of, the change would be wrought, architects and their clients benefited and pleased, the builder himself satisfied, and the rank and file made happy with work, where now there is none. J. C. W.

BUILDING SOCIETIES' STATISTICS.

The Chief Registrar of Friendly Societies has compiled his usual abstract, which has been issued this week as a Parliamentary Paper, of the annual accounts and statements of societies for the year 1903. It appears from the figures that the numbers of incorporated building societies in the counties of the United Kingdom are as follow:—Bedfordshire 15, Berkshire 14, Buckinghamshire 11, Cambridge-shire 11, Cheshire 53, Cornwall 7, Cumberland 16, Derbyshire 23, Devonshire 29, Dorsetshire 12, Durham 104, Essex 39, Gloucestershire 29, Hampshire 49, Herefordshire 7, Hertfordshire 15, Huntingdonshire 1, Kent 57, Lancashire 329, Leicestershire 27, Lincolnshire 15, London 416, Middlesex 29, Monmouthshire 16, Norfolk 12, Northamptonshire 19, Northumberland 64, Nottinghamshire 17, Oxfordshire 3, Rutland-shire 1, Shropshire 8, Somersetshire 34, Staffordshire 56, Suffolk 5, Surrey 28, Sussex 36, Warwickshire 34, Westmorland 6, Wiltshire 9, Worcestershire 13, Yorkshire 93, and Berwick-upon-Tweed 1—total for England, 1,773; Anglesea 1, Brecknockshire 2, Cardiganshire 1, Carmarthenshire 9, Carmarvonshire 11, Den-bighshire 3, Flintshire 1, Glamorganshire 77, Merionethshire 1, Pembrokeshire 2—total for Wales, 108; Aberdeen 10, Argyll 1, Ayr 7, Banff 2, Clackmannan 1, Dumbarton 7, Dum-fries 2, Edinburgh 13, Elgin 2, Fife 15, Forfar 9, Inverness 1, Lanark 35, Linlithgow 2, Nairn 1, Peebles 1, Perth 2, Renfrew 7, Roxburgh 1, Selkirk 3, Stirling 7, Wigton 1—total for Scotland, 130; Antrim 37, Armagh 1, Cork 4, Down 1, Dublin 26, Limerick 1, Londonderry 24, Louth 2, Tyrone 1, and Wicklow 1—total for Ireland, 95; total of incorporated societies for the United Kingdom, 2,109. To this total have to be added 62 unincorporated societies, all in England, making a grand total of 2,171. The number of members enrolled in the 2,171 societies is 601,204.

The total receipts of the societies during the last financial year amounted to 40,734,866l. 1,665 out of the 2,171 societies made advances on mortgage, and the amount so advanced during the year was 9,959,553l.

The liabilities of the societies at the time of making up the balance-sheets were—to the holders of shares, 38,312,729l.; to depositors and other creditors, 24,161,484l.; undivided profits, 3,836,273l.

The assets, on the other hand, were:—Balance due on mortgage securities (not including prospective interest), 51,396,980l.; amount invested in other securities and cash, 14,900,247l.; balance deficits—in England and Wales, 113,039l.; in Scotland, 221l.; in Ireland, nil.

The incorporated societies in the County of London have 117,845 members; their receipts during the year amounted to 5,768,165l.; the amount advanced on mortgage during the year aggregated 2,839,763l.; the liabilities were—to holders of shares, 9,202,460l.; to depositors and other creditors, 3,225,985l.; and the amount of undivided profit was 766,560l. Assets—balance due on mortgage securities (not including prospective interest), 12,245,934l.; other assets, 893,523l.; balance deficits, 55,548l.

The following figures indicate the total receipts during the last financial year of the individual building societies with over 1,000 members each:—Wolverton (Bucks.) Permanent Benefit, 1,026 members, year's receipts, 20,650l.; Cumberland Co-operative Benefit, 2,342, 131,997l.; Derbyshire Permanent, 2752, 79,994l.; Barnstable Permanent Mutual Benefit, 1,389, 12,243l.; Darlington Equitable, 1,166, 45,592l.; Industrial and Provident Permanent, Sunderland, 1,147, 42,867l.; Sunderland Working Men's Permanent, 1,401, 50,898l.; Durham and Yorkshire, Darlington, 1,876, 59,355l.; Bristol, West of England, and South Wales Permanent, 1,566, 171,206l.; Cheltenham and Gloucestershire Permanent, 4,719, 205,590l.; Isle of Thanet Permanent Benefit, 1,520, 55,576l.; Sheerness Permanent Benefit, 2,209, 80,203l.; Burnley, 5,666, 304,377l.; Chatham Permanent Benefit, Liverpool, 1,095, 29,107l.; Queen's Benefit, Manchester, 6,570, 64,348l.; Furness and South Cumberland Permanent Benefit, 1,882, 42,546l.; Colne Permanent Benefit, 1,179, 29,176l.; Marsden, Nelson, Lancashire, 1,446, 37,842l.; Hincley Permanent Benefit, 1,240, 16,913l.; Leicester Permanent, 9,623, 224,806l.; Market Har-borough and District Permanent Benefit, 1,566, 26,141l.; Leicester Temperance and General Permanent, 3,506, 37,381l.; Woolwich Equitable, 4,799, 459,774l.; People's Co-operative Permanent, Greenwich, 1,320, 44,327l.; National Freehold Land and Building, 25, Moorgate-street, 10,035, 544,156l.; Perpetual Investment, New Bridge-street, Black-friars, 2,580, 94,261l.; Temperance Permanent, Ludgate-hill, 9,100, 721,124l.; Fourth City Mutual Benefit, Gresham-street, E.C., 1,813, 226,271l.; Borough of Finsbury Permanent

building has been designed to find sleeping accommodation for about seventy-five men, each having a separate cubicle. The ground floor of the building has a dining-room, in connexion with which is a kitchen for the men to cook their own food; also a shop at which they will be able to purchase provisions which, if it is wished, will be cooked for them. There is also a smoke-room provided. The remainder of the floor is occupied by the sisters' and caretakers' rooms. On the first floor is placed the chapel, which is so arranged that in the event of a detached chapel being erected, it can be divided into cubicles, and thus obtain accommodation for fifteen more men. There is also a recreation-room and five cubicles, sisters' room, etc. The remainder of the floors are given over entirely to the sleeping accommodation for the men. In the basement of the building ample kitchen accommodation has been provided, also a laundry for the lodgers. The architects for the building are Messrs. Brodrick, Lowther, & Walker, and the contractors Messrs. G. Jackson & Son, of Hull. The engineering works have been carried out by Messrs. Bradford & Co., of Salford.

LIBRARY, WALSALL.—A new Carnegie Library is about to be erected in Lichfield-street, Walsall, from the designs of Mr. J. S. Gibson, London. Messrs. Willcock & Co., of Wolverhampton, are the contractors.

BUSINESS PREMISES, BELFAST.—New premises are being built in High-street, Belfast, for Mr. C. McCullagh. Messrs. Blackwood & Jury are the architects for the work, the contractors being Messrs. McLaughlin & Harvey. A "Carara" front is being supplied by Messrs. Doulton & Co., London.

COUNCIL OFFICES, ABRAM, LANCASHIRE.—The District Council of Abram have erected new offices, and these have just been opened. The site of the offices is on the east side of Warrington-road at Abram-brow, opposite St. John's Church. The ground floor contains offices for the clerk, rate collector, nuisance inspector, and pay office. The first floor contains council chamber, 30 ft. by 20 ft., surveyor's office, chairman's parlour, and spare office. There is also a house adjoining containing six rooms, which can be attached to the offices when further accommodation is required. There are three fireproof safe-rooms, and the basement contains cellar for the heating apparatus. The entrance hall is paved with encaustic tiles, and the walls have ornamental glazed tile dado, and the offices have wood-block floors laid on concrete bed. The front elevation is of terra-cotta. The out-buildings consist of stabling for five horses, and hay-loft over, waterman's workshops and store-room, and shed for vehicles. The buildings have been erected by Messrs. Joseph Wilson & Co., of Wigan, and the furnishing by Messrs. Barlow and Messrs. Pendlebury, Ltd., and the heating by Mr. W. H. Gaskell. The total cost has been about 3,400l., and the work has been carried out from the designs and under the supervision of Messrs. Heaton, Ralph, & Heaton, of Wigan.

NEWSPAPER OFFICES, DUNDEE.—New premises are now in course of erection at Meadowside, Reform-street and Euclid-crescent, for the *Dunfer Courier*. The style of the buildings is Renaissance, the material used will be stone from Dumfriesshire quarries, and the total cost, including site, will be over 60,000l. The contract was obtained by Mr. Thomas C. Stooks, builder, Dundee. To secure a stable foundation ferro-concrete piles are being driven, and on these is being laid a bed of ferro-concrete, braced throughout with steel. The building will have seven floors, including basement and mansard, and the main entrance will be in Meadowside. The counting-house and advertising department will be on the street level, editorial departments will be accommodated on intermediate floors, and the composing-room will be on the top. Messrs. Niven & Wigglesworth, architects, prepared the plans for the work.

VICARAGE, THORPE ARCH, YORKSHIRE.—The foundation-stone was recently laid of the new vicarage which is being erected in this village. The design of the building is XVIIth century in style, the lower half being of Pateley Bridge stone, and the upper of hard brick, rough cast, and coloured. The roof will be of tiles, and the windows of leaded lights. Part of both house and stable are to be finished in half-timber work. The architects are Messrs. Oliver & Dodgshun, of Leeds and Carlisle.

SCHOOL EXTENSION, GRAYS, ESSEX.—A local inquiry was held recently at Quarry Hill Schools, Grays, by members of the Essex Education Committee into applications by the Governors of Palmer's Endowed School, Grays, with respect to proposed alterations and extensions. Mr. C. N. Sbiner, architect,

submitted plans to provide accommodation for 100 pupils, teachers attending half-time. Additional classrooms on the boys' side were proposed, to provide for 181 students as against 106 at present, together with a common-room for day boys coming from a distance, and a proportionate increase on the girls' side. It was estimated that the total cost of the land and works would be about 10,000l.

EXTENSION OF BUSINESS PREMISES, HAMMER-SMITH.—Alterations and extensions have been carried out at the premises of Mr. John Broughton, in Kings-street, Bridge-avenue. Mr. D. Carmichael was the architect, and Messrs. Henry Lovatt & Co., London and Wolverhampton, were the builders.

RENOVATION OF THE AQUARIUM, BRIGHTON.—Plans have been prepared by Mr. C. F. W. Gillam, architect, Brighton, for the improvements and alterations which are shortly to be made to the Brighton Aquarium. The scheme provides for the enlargement of the theatre, for a winter garden in place of the existing skating rink, and for the re-roofing and general renovation of the whole building. The work is estimated to cost 12,000l.

BELFAST MATERNITY HOSPITAL.—The new Maternity Hospital in Townsend-street, Belfast, was opened on the 7th inst. The site has a frontage along the east side of Townsend-street of 98 ft., and extends back 183 ft. The entire site is now occupied by the building, which is planned in the shape of the letter T, with the head towards the street. The hospital has three floors, the ground floor being used for the executive, etc., and containing the kitchen wing, the matron's room, committee, and nurses' dining-rooms, the quarters for the resident doctor, a room for students, and at the extreme end of the building the extern department. The principal entrance is in the front facing Townsend-street. The kitchen entrance, the students' and patients' entrances, are from a wide passage along the southern side of the building. The extern department contains a waiting-room and a consulting-room, a bathroom and lavatory, and it is by this portion that all patients will enter the hospital. The principal staircase faces the front entrance, and provision has been made in the stair well for a passenger hoist, communicating with each of the floors. The first or middle floor is devoted to the accommodation of patients, and contains the couchroom, and near it the observation-room, and a room beside it for the use of the nurse on duty for this ward. There are also four wards, each containing four beds, and some smaller one and two bed wards for separate cases or paying patients. Provision has been made for an extension in the future over the extern department, but in the meantime this portion terminates with a garden roof, level with the first floor, at the end of the building, and is reached from the lateral corridor that communicates with the wards. The lavatories, bathrooms, etc., are contained in a sanitary tower as an annexe, separated from the main building by a disconnecting passage. The third or top floor is, with the exception of one four-bed ward, occupied by the sleeping apartments of the staff, the larger rooms being sub-divided by cubicles. The laundry has been placed at the end of the yard. The yard also contains a disinfectant, as well as other hospital requirements. Owing to the floor level being kept well over the surface of the ground, a basement passage has been formed under the corridor, in which all the water, gas, and electric mains are carried. The coal store is also in the basement. The works have been carried out to the designs of Mr. W. J. Fennell, by Messrs. McLaughlin & Harvey, builders. The sanitary fittings and plumbing were entrusted to Mr. S. N. Gray, while the electric lighting was carried out by Messrs. Richard Patterson & Co., Ltd., under the supervision of Mr. John Woodside, consulting electrical engineer.

LABOUR HOME, ANCOATS.—The Lord Mayor of Manchester, on the 7th inst., opened the new wing of the Manchester and Salford Men's Mission Home and Workshop in Hood-street and Murray-street, Ancoats. The new wing provides accommodation for 180 beds, and provides also a day-room, which is to be used for recreative educational purposes in the evenings, besides certain kitchens and other departments. Messrs. Sankey & Cudbon have designed the structure, and the building has been carried out by Messrs. Gerrard, of Swinton.

THEATRE, KIRKCALDY.—The new King's Theatre, Kirkcaldy, was formally opened recently. The new playhouse, which is seated to accommodate from 2,000 to 3,000 persons, has been provided at a cost of 20,000l. It occupies a site on Redburn Wynd and High-street. It has been built from plans prepared by Mr. J. D. Swanston, architect, Kirkcaldy.

On the ground floor are the orchestral pit stalls, and pit, while on the first tier the lower gallery is the dress circle, and the second tier the amphitheatre. The upper gallery is divided into tiers. At each there are five boxes. The stage is 60 ft. by 30 ft., with proscenium opening of 28 ft. Tiring-rooms are provided to the various sections of the house.

STAINED GLASS AND DECORATION

MEMORIAL TO THE LATE MR. HUGH P. HUGHES.—A stained-glass memorial window in memory of the late Mr. Hugh P. Hughes, was unveiled in the Wesleyan Church, City-road, on the 17th inst. The central figure of the window is in a crimson robe, members of the Last Supper on the left, but in the upper part are figures of "Faith," "Hope," and at the base the subjects of the calling of the Apostles St. James, St. John, and St. Peter. Under the central figure are two inscriptions. Mr. H. J. Salisbury, the artist.

SANITARY AND ENGINEERING NEWS

NEW BRIDGE, ABERDEEN.—The new girder bridge connecting Guild-street, Bridge-street, and forming a part of the Aberdeen Joint Station extension works, now almost completed. The total width of the structure over the outside parapets is 57 ft. 6 in., comprising a carriageway 35 ft. clear width, and two footways each 8 ft. wide. The total length between abutments is over 180 ft., divided into two spans of 90 ft. each, and supported on the centre platform of two steel-bulb and riveted octagonal columns, which have each to carry a weight of 450 tons when the bridge is fully loaded. The main girders, which, owing to the limited headroom, project about 8 ft. above the level, in the line of the kerbs, vary in length from 90 ft. to 94 ft., and are 11 ft. deep at centre. They are of the multiple lattice type, with a curved top boom, the latter being the box shape. The main girders are fixed to the abutments, and are provided with machined bearing plates placed between them and the cast-steel bed plates. The top flanges of the girders consist of cross girders averaging about 22 ft. apart, nutted to the top booms of the main girders, and so arranged in position that they lie directly above, and in line of the 6-ft. ways of the railway below, thus utilising as much of the available headroom as possible. Between the main girders, and lengthways of the bridge are fixed lower girders, about 5 ft. apart, the top flanges forming the framework supporting the roadway. The spaces between the main girders are spanned by brick arches, 2 ft. thick, the lower ring being of brick, with concrete haunching above, finished level with the top of the girders, while the surface is spread over with asphalt 1 in. thick. The roadway is formed of 4-in. granite set in sand in the ordinary way, and finished off at the sides with a cast-iron kerb. The footways are similar, but of lighter construction, and are carried on cantilevers projecting in line of the cross girders. They are coated with asphalt, and paved with asphalt slabs. Provision is made below the footways for carrying gas and water pipes, and electric mains, openings being provided for them through the cantilevers and intermediate ports. On the outside of the footways a cast-iron parapet is formed in panels 3 ft. deep, and on the inside a lattice guard railing attached to the main girder. At the ends of the parapets granite ashlar parapets were built. The girder blocks and column bases were built of Rubislaw granite, while the top portions of the masonry work were of Portland cement concrete. The contractors for the whole are Messrs. Findlay & Co., engineers, Melville, and the sub-contractors—Mason & Mr. George Hall; joiner work, Mr. J. Anderson Hall; cast-iron, Messrs. James J. Mathy & Co.; and painter work, Mr. Doxey. The structure has been built from plans prepared by Mr. P. M. Bennett, Engineer-in-Chief of the Great North of Scotland Railway Company.

WATER SUPPLY, GOWDEN AND UPPER HEDGECOTE.—An inquiry was opened by Col. W. P. Black, R.E., on behalf of the Government Board, at Gowden, on the 17th inst., into the application of the Owe Rural Council for sanction to borrow 2,500l. to meet the cost of providing the village of Gowden and the Upper Hedgecte with a proved supply of water. Mr. E. J. Gray, M.P., explained that it was intended to pump a small proportion of the water from two springs in the neighbourhood, the water from which flows into a stream known by the name of Mardy. It

posed to extend the new supply to Whittington. Mr. F. Berrington, the Council's engineer, explained the details of the scheme, and the inquiry was adjourned.

FOREIGN.

FRANCE.—The Académie des Beaux-Arts appointed M. Saint-Saëns Director of the Villa d'Isti, but he has declined the appointment. M. M. Barrias and Bernier also withdrew their names. The architect M. Carou-Duran sole candidate. This apparently is not what was desired or expected, and the Académie is on a look-out for further candidates.—M. Cartran, the painter, has designed a special order for the tickets of the Opéra Comique. The design shows the figure of a Muse in front of a Grecian landscape, in which the Acropolis of Athens is introduced.—On September 3 the monument to Gavarni, by Denys Puech, is to be inaugurated on the site of the ancient fountain of the Place St. Georges. The architectural portion of the monument is by M. Henri Guillaume.—The specialist members of the Paris Municipal Council are demanding the secularisation of a church of the Sacré Cœur at Montmartre, in order to transform it into a "Maison du peuple." A vote of Parliament, however, would be required to carry any such scheme.—M. Georges Ernant, architect, of Laon, has been elected President for 1904-5 of the Société des Architectes de l'Aisne.—The library and the museum at Valence are to be rebuilt, at an estimated cost of half a million francs.—M. Weerts, the painter, has been commissioned by the Government to decorate a grand staircase of the Ecole Nationale des Beaux-Arts at Chaussees, Rue des Saints Pères.—Rodin is at work on a bust of Falguière.—Mme. Garnier, the widow of Charles Garnier, has presented to the Académie Nationale de Musique the bust in bronze, by Dupuis, of the eminent architect. The bust has been placed in the Foyer de la Daise, on the pedestal of Cippolino marble.—The Municipal Council of Paris has under discussion a scheme for a new architectural treatment of the façade of the Bibliothèque de l' Arsenal, and the formation of a square in front of it in the centre of which would be a statue representing "La Gloire Nationale."—M. Perron, the medallist, has just completed the design for a medal in commemoration of the jubilee of Academies. The composition includes draped female figures who symbolise the various Academies; they are crowned with laurel and grouped, under the presidency of Minerva, in a landscape suggestive of the architecture and scenery of Greece.—The new buildings of the Conservatory of Music, at Lyons, were formally opened on Sunday last.—The "Société Protectrice des Animaux" has opened a competition for designs for advertisements, which are now on view at the Grand Palais, at Paris. There are about 150 designs, many of them showing a great deal of taste and originality.—M. Pierre Capoulart, architect, of Toulon, has died, at the age of sixty-nine. He was a pupil of M. Mas, architect, of Brive, and carried out many country houses in that part of France.—The death is also announced, at the age of seventy-two, of M. Kuwasseg, the painter, pupil of his father, and of Durand Brager, who exhibited first in the Salon of 1859, and received a medal in that of 1862. He was especially a painter of sea pictures and marine subjects.

GERMANY.—A new theatre is to be built at Charlottenburg from the plans of the architects, Heilmann & Littmann, of Munich.—The new Catholic church at Ulm, designed by Herr Max Meckel, was consecrated on September 8.—The Commission for the Preservation of Memorials in the German Kingdom have arranged that Professor Dehio, of the University of Bonn, shall compile a "Handbook of German Memorials"; the Commission consists of Professor Cornelius Gurlitt, of Gießen, Professor A. von Oechelhäuser, of Strasbourg, and Herr Loersch, of Bonn.—The altar at Dortmund, designed by Professor Arthur Dülfer, of Munich, was opened on September 17.

AUSTRIA.—The Town Council of Prague have accepted the plans of Professor Koula for the new bridge over the Moldau.—The engineer architect Franz M. Griesbach, died on September 17, at Brüx, in his sixty-sixth year; he had possessed the gold cross of merit, which was granted him on his completion of law courts, at Brüx.

SWITZERLAND.—Important alterations and extensions are to be undertaken at Lausanne, which the "Commission d'Art Public," consisting of five architects, sat in September.

The new museum at Geneva is being built on the plans of Herr Marco Camoletti; the

foundation stone of the building was laid on September 17.—The Swiss Society for Preservation of Historical Memorials held its annual meeting at Locarno on October 25.

A NEW GERMAN ART PAPER.—A new German publication, entitled *Hobe Warte*, has just appeared. This paper, the title of which is best rendered by the English *Watch Tower*, is perhaps equivalent to the *Studio*, though smaller and not so copiously illustrated; but the scope is more limited, and seems only to include what may be termed the "household arts," from external architecture, interiors, furniture, and decoration, to embroidery and photography. In an introductory note the editor announces his intention of showing, where possible, examples of the artistic and inartistic side by side, thus contrasting the good and bad, and leaving the reader to draw his own conclusions. This idea is effectively carried out in the first number by illustrations of model workmen's houses at "Port Sunlight" and "Bournville," as contrasted with a typically hideous row of small dwelling-houses of the old-fashioned kind. There is also an article on "Old Furniture in Modern Houses," by the architect, Franz Messner, illustrated by photographs of a room, the furniture of which dates from the beginning of the XIXth century. Herr Paul Schultze-Naumburg, in an article entitled "Villages," writes an urgent appeal to modern German architects to return to the simple, beautiful, and practical style so prominent in the old German farmhouses, and to leave the more ornate designs for more suitable occasions. Interesting, as showing a return to this simplicity of outline, are the designs by the architect, Professor Joseph Hoffmann, for furniture suitable for use in small modern dwellings. The object of this new magazine is given in the closing words of the editor's introductory note:—"Everywhere are indications of an eager desire for true artistic culture; and, in our opinion, this indication only needs to be constantly guided and turned in the right directions."

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Norton & Gregory, Photographers and Lithographers, etc., have removed from Artillery-row, Victoria-street, to Castle-lane, Buckingham Gate, S.W.

MINERAL OUTPUT FOR 1903.—According to the returns collected by the Inspectors of Mines and Quarries the total output of the principal minerals from all mines, from quarries, and from certain other workings in the United Kingdom in the year 1903 was as follows (in tons):—Alum shale, 5,224; arsenic, 922; arsenical pyrites, 57; barites, 24,271; bauxite, 6,123; chalk, 4,469,974; chert and flint, 73,151; clay and shale, 16,198,021; coal, 230,334,469; copper ore, 6,428; copper precipitate, 439; fluor spar, 11,911; gold ore (auriferous quartz), 23,600; gravel and sand, 2,245,757; gypsum, 219,897; igneous rocks, 5,425,538; iron ore, 15,715,645; iron pyrites, 9,539; lead ore, 26,567; limestone, 12,222,971; manganese ore, 213; celestine and amber, 14,150; oil shale, 2,009,602; phosphate of lime, 70; salt, 1,836,992; sandstone, 5,408,502; slate, 531,612; sulphate of strontia, 22,842; tin ore, 7,351; uranium ore, 6; wolfram, 272; zinc ore, 24,898.

THE INCORPORATED CHURCH-BUILDING SOCIETY.—This Society held its usual monthly meeting on the 17th inst., at the Society's House, 7, Dean's-yard, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Heigham, St. Barnabas, near Norwich, 105*l.*, and Smethwick, St. Alban, near Birmingham, 150*l.*; rebuilding the church at Sparkwell, All Saints, near Plympton, Devon, 20*l.*, and towards enlarging or otherwise improving the accommodation in the churches at Aberystwyth, St. Michael and All Angels, Cardigan, 60*l.*; Borstal, St. Matthew, near Rochester, 50*l.*; Cardigan, St. Mary, 50*l.*; Clevedon, St. Andrew, Somerset, 40*l.*; Compton, St. Mary and St. Nicholas, Berks, 25*l.*; Egg Buckland, St. Erasmus, near Crownhill, Devon, 10*l.*; Heckmondwike, St. James, Yorks, 50*l.*; Hednesford, St. Peter, near Stafford, 60*l.*; Hilton, St. Mary Magdalen, near St. Ives, Hants, 25*l.*; Little Ilford, St. Barnabas, 25*l.*, making in all 100*l.*; and Usworth, Holy Trinity, Durham, 35*l.* Grants were also made from the special Mission

"The Watch Tower" illustrated fortnightly magazine for the cultivation of home interests, artistic, intellectual, and practical. Founded by Josef Aug. Lux with the collaboration of the highest authorities. (*Hobe Warte*, Illustrierte Halbmonatsschrift für die künstlerischen, geistigen und wirtschaftlichen Interessen der Städtischen Kultur. Begründet von Josef Aug. Lux unter Mitwirkung erster Autoritäten). Lux and Lässig, Vienna. Carl Fleischer, Leipzig.

Buildings Fund towards building mission churches at Leyton, St. Edward, Essex, 50*l.*; and Skewen, near North Glam, 30*l.* The following grants were also paid for works completed:—Winterton, All Saints, near Doncaster, 25*l.*; West Bergholt, St. Mary, near Colchester, 60*l.* on account of a grant of 100*l.*; Ilenny, St. David, Glam., 100*l.*; Gainsborough, St. John, Lincs., 10*l.*, making in all 110*l.*; Brechfa, St. Teilo, Carmarthen, 20*l.*; Westham, St. Paul, near Weymouth, 25*l.* on account of a grant of 200*l.*; Downe, St. Mary, Kent, 5*l.*; Newcastle-on-Tyne, St. Matthew, 40*l.*; Leicester, St. Mark, 75*l.*; Bristol, St. Aidan, 130*l.*; Cutworth, St. Michael, Somerset, 25*l.*; Plymouth, St. Augustine, 75*l.*; Simpson, St. Thomas, near Blechley, Bucks., 20*l.*; Goresfield, near Wisbeck, 20*l.*; Heath Hayes, near Cannock, Staffs., 50*l.*; Bushey, Herts, 50*l.*; Eltham, St. Luke, Kent, 25*l.*; and Llaunsadwrn, Capel Dewi, Carmarthen, 25*l.* In addition to this a sum of 431*l.* was paid towards the repairs of twenty-five churches from trust funds held by the Society. Before proceeding to the usual business of the meeting, the following resolution was unanimously adopted:—"The Committee of the Incorporated Church Building Society, at its first meeting after the death of their friend and colleague Mr. F. C. Dobbing, desire to record their sense of the great value to the Society of his ripe experience, which, by his frequent attendance at their meetings, was placed at their service. They take this opportunity of recalling with gratitude his generosity to the Society, especially to the Mission Buildings Fund, to which he was a regular and most liberal contributor; they recognise with thankfulness his work for the church by his untiring zeal to promote the increase of free church accommodation, and they tender to Mrs. Dobbing and her family this expression of sincere sympathy."

AN ARTISTIC ALMANACK.—We do not usually notice the crowd of almanacks in sheet form which are sent out at this time of the year, and which seldom have anything in their design worth special notice. The sheet issued under the title "Calendariarum Londinense" (W. Monk and Elkin Mathews, Vigo-street) is, however, an exception. It is merely one folio sheet, the lower half of which contains the days of month and week in the year, the upper half contains an etching of a London subject by Mr. W. Monk. This is the third year of issue. The subject on this year's sheet is a view towards Westminster from the bank of the Thames at Grosvenor-road, a little way west of Lambeth Bridge; the shipping and staging, etc., forming an effective foreground, and the upper part of the Victoria Tower appearing over the houses. It is an admirable etching, and represents a corner of London which, when ever Lambeth Bridge is rebuilt, will probably be very much altered. The object of the publication is really to issue every year, for 2s. 6d., an etching of some point of interest in London, combined with an almanack. Such an almanack merits the support of architects.

BIRMINGHAM MASTER BUILDERS' ASSOCIATION.—The annual meeting of the members of the Birmingham Master Builders' Association was held on the 17th inst. at the Grand Hotel, the President (Lieut.-Colonel John Barsley) in the chair. The committee, in their report, regretted to have to still record the continuation of the depressed condition of trade referred to in the last two annual reports. Having secured the omission from the Operative Plasterers' general rules of the objectionable clause in Rule 3, Clause 15, the committee resigned the old rules with the operatives for twelve months, from April 1 last. Although the present state of trade fully justified notice being given for a general reduction in wages, the committee, after careful consideration, had decided not to disturb the trade this year. The committee recorded with pleasure the election of Mr. C. H. Barsley to the office of President of the Institute of Builders, and also the election of Mr. E. G. Whittal as one of the vice-presidents of the Midland Federation of Building Trade Employers. Satisfactory conclusions had been arrived at with the Architectural Association as to the interpretation of the prime-cost clause in the conditions of contract, and "on the question of making good after other trades." A prize of one guinea had again been offered by the Association for competition amongst the masonry students at the Municipal Technical School. The committee recommended that next year a total sum of five guineas should be offered to the students in the classes connected with the building trade at the Municipal Technical School, the details to be arranged after consultation with the headmaster. The total membership was now ninety-two. The balance sheet was described as satisfactory. The President, in

moving the adoption of the report, said the work of the Association during the past year had been chiefly of a routine character. The report opened with an expression of regret that the condition of trade had not improved during the year. They had to deplore depressed trade last year, and he thought, on the whole, they had again to deplore still more depression this year. The motion was seconded by the vice-president (Mr. J. B. Whitehouse), who remarked that the committee were refraining from giving notice of reduction of wage, although many considered that the depression in trade justified such a course. He thought they held that trade was not to be revived by cutting down men's wages. What they wanted to do was to encourage the men to give them of their best. Lieut.-Colonel Barnsley was re-elected President for the ensuing year, and Mr. J. B. Whitehouse vice-president. A committee and other officers were appointed. The annual dinner followed in the Grosvenor Rooms at the Grand Hotel. Lieut.-Colonel J. Barnsley, V.D., occupied the chair, and among those present were the Lord Mayor (Councillor R. H. Berkeley), County Alderman J. Bowen, Councillor Whittall, Messrs. J. Cooper (President Birmingham Architectural Association), J. B. Whitehouse (vice-chairman of the Master Builders' Association), C. H. Barnsley (President, Institute of Builders), J. Sharman Wood (President Midland Federation), and Alderman Bigwood (secretary). The loyal toasts having been honoured, the toast "Success to the Birmingham Builders' Association and the Trade of the City" was proposed by the Lord Mayor, who expressed regret that the state of trade generally was not satisfactory. The building trade might fairly represent what was happening in other trades, and it was significant to observe that the number of plans submitted last year at the city surveyor's office numbered 1,563, as compared with 2,352 in the preceding year. He hoped that there were better times in store in the near future. They could not, however, help looking with anxiety at the great number of men unemployed at the present moment. If it should be a hard winter that number would be increased.

The Corporation committees, who were in the habit of engaging temporary workmen, would, he felt sure, do all that was possible in the way of putting work to the front. The President, acknowledging the toast, said Birmingham men were proud of its institutions. The year had been crowned with that crowning blessing—the Welsh water. The toast "The Architects and Surveyors" was proposed by Alderman Bowen, and Mr. Thomas Cooper replied on behalf of the Birmingham Architectural Association. "Kindred Associations" was submitted by Mr. Whitehouse, and acknowledged by Mr. C. H. Barnsley. Councillor Whittall proposed the health of "The Visitors," and Mr. W. H. Kenrick replied.

BUILDING BY-LAWS.—The dispute between Mr. Justice Grantham and Chailey Rural Council in regard to the plans of a cottages which the judge proposes to build at Barcombe advanced another stage on the 18th inst. Sir William had given notice to the Council that, in spite of their refusal to pass the plans, he intended to go on with the building, and, in accordance with instructions, Sir William's employees started work. They met with no interference on the part of the Chailey Rural Council's officials. The clerk has written to Sir William stating that, in the Council's opinion, his letters to that body fully establish the necessity of any action the Council has taken in the discharge of its duty as the sanitary authority. A special meeting of the Council is to be held to decide what action shall be taken now that Sir William has gone on with the building before the plans have been passed.

THE TAIRY COMMISSION.—The Tariff Commission has held four meetings during the past fortnight at the Whitehall Rooms, under the chairmanship of Sir Robert Herbert, making seventy-five sittings to date. At the last four meetings evidence was taken in regard to the engineering, building, furniture, and textile trades. The witnesses examined in each section were as follows:—*Engineering*—Mr. John McLaren (J. & H. McLaren, Midland Engine Works, Leeds, engineers), and Mr. George Cradock (Geo. Cradock & Co. Wakefield, wire drawers and rollers). *Building*—Mr. J. Howard Colls (Colls & Sons, 5, Coleman-street, E.G., builders and contractors). *Furniture*—Mr. W. H. Greenfell (M.P. for the Wycombe Division Bucks.) made a preliminary statement on the history and development of the trade of High Wycombe and district, and the following witnesses were examined:—Mr. Walter Birch, of William Birch, Ltd., High Wycombe, and 370, Euston-road, London (chair manufac-

turers, cabinet makers, and upholsterers); Mr. Charles Skull, of W. Skull & Sons, Ltd., High Wycombe, and 45, Berners-street, W. (chair manufacturers, cabinet makers, and upholsterers). *Textiles*—Mr. James Mackay (Palmer & Mackay, Trowbridge, woollen manufacturers); Mr. H. Lovell Hewitt (Kemp & Hewitt, Ltd., Innox and Silver-street Mills, Trowbridge, woollen manufacturers); Mr. Alfred Sykes (Joseph Sykes & Co., Ltd., Brockholes, near Huddersfield, woollen manufacturers).

THE LECKY MEMORIAL, DUBLIN.—A meeting of the executive committee of the Lecky Memorial was held on the 20th inst. at 45, Merrion-square. It was proposed by the Dean of St. Patrick's, and seconded by Mr. Justice Ross, and passed, that Mr. W. Goscombe John, A.R.A., be commissioned to execute the statue of the late Right Hon. W. E. H. Lecky, for which a site has been granted within the precincts of Trinity College, Dublin.

APPOINTMENTS.—The members of the Officers and Clerks Committee sat at the Guildhall on the 22nd inst. for the purpose of making a final selection of candidates for the vacant position of City Surveyor. The list of twelve candidates previously selected was reduced to five, their names being:—Mr. F. Brown, of the London County Council Department, 19, Gharing Cross-road; Mr. J. E. Crouch, 29, Basinghall-street; Mr. S. Perks, 5, Crown-court, Cheapside; Mr. G. W. H. Prescott, Urban Council Office, Tottenham; and Mr. F. Sinner, Surveyors' Department, Plumstead. *The City Press* understands that an effort will be made by several members to induce the Corporation to increase the commencing salary of the office from 1,000*l.* per annum to, probably, 1,400*l.*

ROLLER BEARINGS FOR RAILWAY CARRIAGES.—An experiment, which serves to demonstrate in a striking manner the efficiency of roller bearings, has been in progress by the London, Brighton, and South Coast Railway Company since January last year. In that month the company commenced the regular use of a bogie coach fitted with the "empire" type of roller bearings. After experimental runs extending over an aggregate of 80,000 miles, the results were considered so satisfactory that further tests are now being conducted with the aid of a complete train of vehicles with similar bearings. For the purposes of comparison, a train of identical composition but with ordinary bearings is to be run along the same route and for equal distances. Records will be kept of coal consumption in each case, and if the anticipated saving of 10 lb. per train-mile should be realised, there is every reason for hoping that the adoption of roller bearings may become universal. It has already been demonstrated that the motion is far more pleasant for passengers, and that trains can be started much more rapidly than with ordinary bearings. This last point is of considerable importance to lines upon which it is necessary to provide services with very short intervals between the trains.

REVERDS, ST. MARGARET'S CHURCH, MOUNTAIN ASH.—At St. Margaret's Church, Mountain Ash, recently, the Bishop of Landaff unveiled and dedicated a reredos. The design of the reredos is Early English in character, and is executed in Caen stone. The spandrels between the gables of the central portion, and the arches of the wings are of selected alabaster. The clustered columns carrying the canopies of niches, in which are placed the sculptured figures, are of green Gonnemara and red Orwell marble. The copings of the gables between the niches rest on carved angels with extended wings, and the reredos proper is surmounted with richly-carved ornament. The retable is of pink alabaster. The plinth immediately under the base of the old structure is green stone from the Bridgend quarries. The work has been executed from the designs of Mr. Bruce-Vaughan, of Cardiff, by Messrs. H. H. Martyn & Co., Cheltenham.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—Employment in the building trades continued dull during October, and on the whole was rather worse than in September. It was also worse than a year ago. Employment with carpenters and joiners was bad generally, and worse than a month ago and a year ago. The percentage of unemployed trade union carpenters and joiners was 83 at the end of October, compared with 70 at the end of September, and 56 at the end of October, 1903. With plumbers it was dull generally. The percentage of unemployed trade union plumbers was 91 at the end of October, compared with 95 at the end of September, and 66 a year ago.—*Labour Gazette.*

Legal.

ACTION BY AN ARCHITECT FOR FEES.

The case of Worley v. Jay came before Justice Ridley, sitting without a jury, in King's Bench Division on the 17th inst. action by the plaintiff, Mr. C. H. Worley, architect, to recover from the defendant, J. W. Jay, 115*l.* professional fees.

Mr. Abel Thomas, K.C., and Mr. M. J. F. Banks, K.C., and Mr. Ernest Pollock for defendant.

Mr. Abel Thomas, in opening the case, the action was brought by the plaintiff who for many years had practised as an architect in Welbeck-street, W., to recover from the defendant his fees for services rendered. It appeared that Worley had a private residence in the neighbourhood of Potters Bar, and Mr. Jay, defendant, also resided there. The plaintiff claimed 115*l.* for work done in preparing and getting estimates for the erection of stables, coach-house, and cottages on defendant's premises. The pleaded deal was that plaintiff did no work at the request of the defendant and that his fees were excessive. The building work was never carried out, but an estimate was obtained, and a fore-plaintiff was entitled to the amount claimed. The defendant also pleaded that condition precedent to the plaintiff's claim was that the building of the stables, coach-house, and cottages from the plaintiff's plans should not exceed the cost of 100*l.* This the plaintiff denied.

Mr. Banks said that the defendant's was that the plaintiff understood that he not prepared to build unless plaintiff produced plans of buildings which would cost more than 1,000*l.*, and that if the defendant did not build he should pay the plaintiff 5*l.* for the plans and 3*l.* for the defendant's quantities. The defendant only obeyed the plaintiff's instructions to do the work, the stipulation that he was not going to exceed 1,000*l.*, and if the plaintiff should produce plans of buildings which would cost more than 1,000*l.* to erect, that was his own risk.

Mr. C. H. Worley, F.R.I.B.A., examined Mr. Thomas, said he had been in practice about twenty-five years. On February 3, 1904, defendant called at his office and said he desired to build stables, etc. Defendant asked him to advise him on the matter. Witness did so, and took down particulars of accommodation required. A question was asked as to what his fees would be. Witness replied that they would be 5 per cent. of cost, with the additional charges of taking the levels. Defendant did not raise any objection to that. It was not true, said witness, that at any other agreed to prepare the plans for the stables and cottages for 5*l.* At this interview defendant never said anything about 1,000*l.* being the amount wished to spend. Having regard to the particulars he took from the defendant, it was impossible to erect the buildings for 100*l.* or anything like it. Shortly after this witness went with the defendant to the site, that he prepared two alternative sketches. They were drawn 16 ft. to the inch. Defendant approved of one, from which the plans were subsequently drawn. It was decided that he should draw them to the usual scale of 8 ft. to the inch, so as to obtain ten copies. About March 18 he had an interview with defendant, when he returned the sketches. Defendant then asked if the building would be likely to cost 1,000*l.* Witness replied that that was an absurd figure, but the cottages themselves would cost about 100*l.* each. Then the defendant suggested that (plaintiff) should go on and get tenders to see what the price actually would be. Defendant afterwards instructed him to prepare tenders. He afterwards attended on the site and took levels, prepared the specifications, and got a tender from a Mr. Lewis. Witness saw him some time after that. Defendant said that the estimate was a good deal more than he desired to spend, and witness suggested that he should endeavour to reduce the cost. Defendant, however, did not tell witness the amount he wished to spend. Witness altered the plans and reduced the cost to some 300*l.* or 400*l.* The next thing he saw was on September 23, when the defendant rang him up on the telephone, and said he had decided to abandon building altogether. Defendant said, "I suppose I owe you nothing." Witness replied that he did not. Defendant said, "I propose sending you a cheque for 5*l.* 5*s.*" Witness replied, "You are joking," and then the telephone was rung.

to then sent in his account in the usual way. His charges were usual. He had never understood that he was to prepare plans for buildings which were not to cost more than 1,000l. He had charged the defendant 5l. 5s. with respect to the work he had done in connexion with some negotiations between Mr. Alderman Strong and the defendant as to the purchase of a piece of the defendant's land by Mr. Alderman Strong. He had prepared a plan and discussed the matter both with Mr. Jay at his house and also with the architect representing Mr. Alderman Strong.

Cross-examined by Mr. Bankes. He was a busy man, but he recollected the details of this business pretty fairly. He told the defendant what the Institute charges were. He did not have a discussion with the defendant as to whether he should receive 2 per cent. or 2½ per cent. He had never suggested that he should have the quantities got out for 3l. 3s. He could not have suggested such a thing, as such a figure as that was ridiculous.

His lordship: The figure is ridiculous. I do not think that any architect could have said that.

Cross-examination continued. I suggest that at every interview you have had with the defendant he always endeavoured to make it plain that the utmost he would spend was 1,000l.?—I cannot help what you suggest, but it is not the fact.

This being the plaintiff's case, Mr. Bankes said he would at once call his evidence. According to—

Mr. Jay, the defendant, examined by Mr. Bankes, said he was a partner in a business in Oxford-street. His house was a small one, his present stables being close by. The accommodation he had at present was a two-stall stable, coach-house, harness-room, and cleaning-room. He was on visiting terms with the plaintiff, who told him that his stables were a disgrace to his house, and an eyesore. Witness told him that he had got 1,000l. to spend, and plaintiff said he would get out plans for buildings at that price. At a subsequent interview he asked plaintiff what his charges would be, and he said 5l. 5s. and 2½ per cent. Plaintiff prepared the sketches. At several interviews the question of price was mentioned. Plaintiff said he would get a builder's clerk to get out the quantities, but that would cost 2l. 3s. Witness agreed to pay that. He afterwards told plaintiff that he could not afford to spend so much as 2,400l. on the buildings, and offered to send him on a cheque for the 5l. 5s. and the 3l. 3s. Plaintiff told him over the telephone that he must be silly to suggest such a figure.

His lordship at this stage said he did not think the plaintiff could substantiate his claim of 5l. 5s., his fees in connexion with the negotiations with Mr. Alderman Strong.

Mr. Thomas: I agree, my lord. The defendant was then cross-examined by Mr. Thomas. He said he wanted four stalls, two loose boxes, room for six carriages, and two cottages. He was under the impression that building these would cost him about 1,000l.

As a business man, do you think they could be built for 1,000l.?—Well I think from 1,000l. to 1,500l.

Cross-examination continued. He approved the plans. It did not strike him that he was getting a good deal for his 5s.

Re-examined. He had never had any experience of building at all. He did not know what a brick would cost. He should not have gone into the matter at all if he had thought that the cost of the buildings would be something near 1,000l.

Mrs. Florence Jay, the wife of the defendant, having given evidence, the defendant's case was closed.

Mr. Bankes then addressed his lordship on behalf of the defendant, Mr. Thomas not being called on to reply.

Mr. Justice Ridley, in giving judgment, said he did not think the defendant had made it that it was a term of the plaintiff's employment that the cost of the buildings should not exceed 1,000l. Having regard to what the defendant wanted, it was quite impossible for it to have been in the mind of either the plaintiff or the defendant that all that could be got for 1,000l. He thought he ought to be in favour of the plaintiff. He accordingly gave judgment for him for the sum aimed, less the 5l. 5s. he had previously mentioned.

Mr. Thomas: That will be judgment for the plaintiff for 94l. 19s. beyond the 15l. 15s. bid into court.

His lordship: Yes. Mr. Bankes: I suppose the plans will be sent to us on payment of the money?

His lordship: Yes. I had a case about that the day before yesterday. I then said I should follow the ruling in Ebdy v. McGowan. Mr. Thomas said the plaintiff would hand the plans over, of course.

ARCHITECT'S ACTION AGAINST SURVEYOR FOR FEES.

THE case of Norton v. Tracy came before Mr. Justice Lawrance and a common jury in the King's Bench Division on the 21st inst., an action by the plaintiff, Mr. Chas. Harold Norton, an architect, against the defendant, Mr. C. F. Tracy, a surveyor, for fees. The defence was a denial of liability. The defendant had also counter-claimed against the plaintiff for damages, but the counter-claim was now withdrawn.

Mr. Oliver appeared for the plaintiff, and Mr. Shaw for the defendant.

Mr. Oliver, in opening the plaintiff's case, said his client brought the action to recover from the defendant two sums of 50l. each, and also a sum of 20l. for extra work. The plaintiff had given the defendant credit for 20l. received, but he should have given credit for 30l., so that that reduced the claim to 30l. The facts of the case were as follows:—In the early part of 1899 the plaintiff and the defendant were very friendly, and the defendant was desirous of erecting a block of flats in Stoke Newington, and he approached the plaintiff to draw the plans and specifications. After negotiations it was agreed that the plaintiff should receive for this work a fee of 50l. The plaintiff promised to look after the work and to see that it was carried out according to the plans. The erection of the flats having been started, defendant had to get assistance, and he applied to the plaintiff to go to the works more often than he had expected he would have to do, and to give certificates. As this entailed extra work on the plaintiff, defendant agreed to give the plaintiff 20l. extra remuneration. As the work went on the defendant advanced to the plaintiff sums which amounted in the aggregate to 30l. After that work was finished negotiations were again entered into with regard to building another block of flats, and the result was that the defendant promised, in consideration of the plaintiff drawing the plans for the second block of flats, to give plaintiff 50l. The plaintiff made the plans and defendant approved of them. Then the defendant found he was not in a position to commence building, and the result was that the work had to stand over. This went on until the latter part of 1903, when there came about some small disagreement between the parties. Subsequently the plaintiff wrote to the defendant stating that he must have some money, and ultimately the defendant wrote that he did not consider he owed the plaintiff any money at all, saying that the plaintiff's work had been no use to him. Plaintiff then commenced the present action. Defendant had claimed damages against the plaintiff, saying that through plaintiff he had lost 1,500l., but that claim was now withdrawn. The only thing to be decided now was whether the plaintiff had carried out the defendant's instructions.

Mr. Chas. Harold Norton, examined, said he was an architect, practising in Bedford-row, W.C. In 1899 the defendant approached him with regard to making plans for the erection of flats at Stoke Newington. He arranged with the defendant that he was to be paid 50l. for drawing the plans. The defendant built these flats. Witness obtained the sanction of the District Surveyor to the plans, and he prepared the specification. Defendant afterwards asked him to superintend the building of the flats, and to give certificates. Defendant agreed to pay him 20l. for that work.

His lordship said if the plaintiff relied on a letter, dated August 21, 1900, as a contract, it required a stamp.

Mr. Oliver said he would withdraw the letter in these circumstances.

Examination continued. After the buildings were finished the defendant applied to him to make the plans for another block of flats. After negotiations witness agreed to do the work for 3 per cent. on the estimated cost of the building, if erected, and 1 per cent. if the scheme should fall through. On May 5, 1902, the defendant wrote offering to pay witness 2½ per cent. on the estimated cost of the building. On May 7 witness replied, agreeing to reduce the amount to 2½ per cent. on the cost of the building. He prepared the plans for the block of flats, and also the specification; but the defendant never erected the flats. He had applied to the defendant for the 1 per cent. on the estimated cost of the building—viz., 50l. Defendant had at various times paid him sums amounting altogether to 30l. Up to November,

1902, defendant had never denied his liability. He heard on Tuesday, the 15th inst., that the counter-claim had been withdrawn.

Cross-examined.

At the time the contract was entered into it was proposed to build both blocks of flats at the same time. At the time that the contract of May 12, 1899, was entered into two sets of sketch plans were prepared by a Mr. Stubbs, an architect, and were given to witness by the defendant. He thereupon prepared the plans for both the blocks of flats it was proposed to erect. The defendant at that time was only able to obtain enough money for putting up one block of flats. The erection of the first block was very disastrous to the defendant. The first builder failed to carry out the work, and a new builder had to complete it at an extra cost. There was a great deal of trouble in the erection of the buildings.

Did not the defendant call your attention to the fact that he had been a very heavy loser over the erection of the first block?—No; he said he was not making much profit on it.

Did you not on that occasion say that if he would employ you as architect to superintend the next block at 2½ per cent. you would waive the balance owing to you on the first block?—Certainly not.

His lordship (to Mr. Oliver): What is it you now claim?

Mr. Oliver: My claim is for 50l. in respect of the first block, and 50l. for the second, and from that there is to be deducted 30l. That will leave 70l.

This being the plaintiff's case,

Mr. Tracy, the defendant, called and examined, said that in 1899 he was very friendly with the plaintiff, who was a young man just starting business. At that time he proposed to put up both blocks of flats at the same time. The letter of May 12, 1899, referred to plans for both blocks. As a matter of fact plans for both blocks were passed immediately, and were passed by the District Surveyor shortly afterwards. He failed for the time to get the necessary finances to enable him to put up the whole scheme. He therefore proceeded with the erection of one block only at that time. There was a great deal of trouble with regard to the flats—it was a fearful job. The first builder overdraw, and he had to employ another one at a great deal of additional expense. It ruined the job. Subsequently he had a conversation with the plaintiff with regard to the scheme altogether. A conversation took place between them about payment. Plaintiff said they had both had a loss on the first block, and the best thing was to wipe the whole thing out and start afresh with the new block. Witness was to pay plaintiff 2½ per cent. on the cost of the buildings. He stipulated that that was only in the event of the buildings being proceeded with. There was no foundation for saying that he agreed to pay plaintiff an extra 50l. whether the buildings were erected or not. He had, up to the present, failed to raise the necessary finances for the erection of the second block of flats.

Cross-examined.

Mr. Smith, the builder of the first block, was a friend of his. He used to write to the architect for the certificates for Smith. He was a surveyor himself, but at that time he was not practising. He had never suggested to the plaintiff that he was to receive 50l. for preparing the plans for the first block. It was understood that plaintiff was to receive 50l. for the plans of the two jobs. The second block of flats would be put up as soon as he could get finances to do so. The plaintiff took on the work in a speculative manner.

This being the defendant's case, his lordship asked the learned counsel what the questions for the jury were.

Mr. Oliver said that the reason why the jury were asked to try the case was because there was a counter-claim. That counter-claim was now withdrawn. If it had not been for that counter-claim the case would have been tried before his lordship without a jury. The only question seemed to be whether there was the agreement by the defendant to pay the 1 per cent. upon the second block of flats made on May 5, 1902.

His lordship said he should tell the jury that it was a question for him to decide whether there was a contract which entitled the plaintiff to the 1 per cent. There was no acceptance by the defendant in writing of the plaintiff's suggestion that he should have the 1 per cent. He thought it was an attempt to add to the contract of May 5 something which was not accepted by the defendant.

Mr. Oliver contended that the three letters taken together made the contract.

His lordship: It was only a proposal made by the plaintiff to the defendant that if the

building was not proceeded with he should have 1 per cent. That was never accepted by the defendant at all. There must be judgment for the defendant, with costs, on the claim, and for the plaintiff on the defendant's counter-claim, with costs.

Mr. Shaw said that the defendant withdrew the counter-claim last week, and he did not see what additional cost the plaintiff could have been put to by it.

His lordship said that was a question for the taxing-master to deal with.

ACTION BY A SURVEYOR FOR FEES.

THE case of Klencz v. Farris and others came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 15th and 17th insts., on the appeal of the plaintiff, Mr. J. M. Klencz, a surveyor, from judgment entered at the trial before Mr. Justice Darling and a common jury in the King's Bench Division on April 14 last. (The case was reported in the issue of the *Builder* of April 23, 1904.)

The action was brought by the plaintiff against the defendants, Messrs. C. Farris and E. F. Fitch, churchwardens, and Messrs. A. W. H. Little and T. Freeman, overseers of the parish of St. Ethelburga, to recover 78l. 15s. for work done by the plaintiff as surveyor for and on behalf of the defendants. The defence was a denial of liability.

The plaintiff's case was that he had, before the year 1900, been engaged on many occasions by the overseers of St. Ethelburga in the valuation of property, etc. In 1900 there was a scheme to run tube railways through the parish of Bishopsgate, it being proposed that one of the lines should pass under the church of St. Ethelburga. It was thought that the railway might injure the church and other buildings, and on December 6, 1900, a meeting of the vestry was held, at which the defendants were present. At the meeting a letter was read stating that it was proposed to call a meeting on behalf of the Ward of Bishopsgate to decide the question of opposing the Bills for the railways in Parliament. It was then decided that the two churchwardens should attend that meeting, and the plaintiff's case was that he was instructed also to attend the meeting, as an expert on behalf of the vestry. The plaintiff attended the public meeting, when it was decided to start an organised opposition to the railway Bills, and a committee of subscribers was formed. The plaintiff was one of the committee, and he attended the meetings of the committee. On December 12, 1901, he prepared a report addressed to the overseers and churchwardens, and that report was read at a meeting of the vestry. At that meeting one of the members asked the plaintiff if he expected to be paid for his services, and the plaintiff replied that he did. In April and July, 1902, the plaintiff sent in further reports, and in March, 1903, he sent in his account, but received a letter stating that it could not be entertained, as he had no instructions to act for the parish. In cross-examination the plaintiff said he had subscribed 5l. 5s. to the funds of the committee, and had attended frequently before the Board of Trade and the Parliamentary Committee. The committee, owing to lack of funds, ceased to exist in February, 1902. After this he still continued to act on behalf of the parish, and sent in two reports to the vestry. About one-half of his claim was for work done before the committee ceased to exist, and the remainder for work done after February 3, 1902, when the committee ceased to exist. The defendants' case was that all that the plaintiff was appointed to do was to represent the vestry at the public meeting, and so far as he did any work he did it as a voluntary member of the committee of subscribers. Mr. Justice Darling said he should take the opinion of the jury on the question of amount in case there was an appeal on the point of law. He accordingly asked the jury to say what amount the plaintiff was entitled to for work done down to February 3, 1902, and for work done after that date. The jury found that the plaintiff was entitled to 25l. under each head. Mr. Justice Darling then gave judgment for the defendants on the point of law, but granted a stay of execution in view of the plaintiff appealing from his judgment. Hence the present appeal of the plaintiff.

Mr. Lewis Thomas appeared for the appellant, and Mr. Ernest Pollock for the respondents. At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, after stating the facts, said it was admitted that the defendants could not be sued as individually liable. It was said, however, that, by virtue of the Act, 59 George III, cap. 12, section 19, the defendants could be sued as representing the parish. That Act

did, for certain special purposes, vest certain buildings in the churchwardens and overseers of a parish, and created a limited power in certain circumstances to sue them as representing the parish. It did not, however, cover such a claim as the present one for services rendered in advising those who were opposing the tube Bill in Parliament. The case was not within the section. There was, therefore, no statutory power to sue the defendants in their representative capacity, and the action accordingly fell to the ground. He was also of opinion that there was no evidence of any contract to employ and pay the plaintiff. He thought the appeal failed on all grounds. The Lords Justices concurred, and the appeal accordingly was dismissed, with costs.

PLASTERER'S ACTION AGAINST A BUILDER.

THE case of Morris v. Cooke came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 22nd inst., on the appeal of the plaintiff from a judgment of Mr. Justice Ridley at the High Court Assizes.

Mr. Disturnal, Mr. J. B. Matthews, and Mr. Bosanquet appeared for the appellant, and Mr. Amphlett, K.C., and Mr. Adler for the respondent.

Mr. Disturnal said the action was brought to recover damages for personal injuries sustained by plaintiff through the alleged negligence of the defendant or his servants. At the time of the accident the defendant was engaged as a builder and contractor in the erection of a post-office at Ledbury, and under his contract with the post-office authorities he had, of course, to find all materials and plant necessary for the building. The plaintiff was a plasterer, and he was engaged by the defendant upon the post-office under a contract to do a certain small amount of the plastering work on the outside of the building. His contract was made upon the basis of an extract from the original quantities relating to this particular plastering, and the plaintiff tendered upon that basis for a sum of about 33l., and he was engaged by the defendant to do that work. In the course of that work the scaffolding upon which plaintiff was standing broke down by reason of one of the putlogs being defective, and plaintiff was precipitated to the ground, and he was seriously injured. The plaintiff complained that the learned judge did not deal with what was the real issue in the case, but decided the case against him on an issue which was really not relevant, and as to which he said there was no evidence to support it. One of the putlogs used for the scaffolding was admittedly defective, and it broke in two by reason of the weight put upon it, and brought about the accident. It was admitted, and it was common ground at the trial, that it was the defendant's duty to provide the materials for the scaffolding. It was proved beyond a doubt that the scaffolding broke down through the defect in the putlog, which was part of the material it was the defendant's duty to supply. He (counsel) submitted that, if that were so, there was, at any rate, a *prima facie* case for the learned judge to consider.

The Master of the Rolls: Who made the scaffolding? Mr. Disturnal said there was a controversy about that. His first point was that there was that duty upon the defendant to supply the material from which the scaffolding had to be constructed. The scaffolding broke down, and the learned judge had not considered how far that negligence was the cause of the accident, and how far the plaintiff himself was guilty of anything which contributed to it. There was a controversy during the course of the case as to which person had constructed the scaffolding, and there was some conflict of evidence on that matter. The plaintiff's evidence was that the putlogs which had previously been there for the building of the wall for some reason had been removed, but the holes were in the wall where they previously had been. He said he told one of the defendant's men that he wanted scaffolding for his work, and that thereupon the defendant's foreman directed one of his men to go and build the scaffolding. That man's name was Nichols. Nichols got the assistance of a labourer in the employment of the plaintiff, named Preece, and Nichols handed up the putlogs to Preece, and the latter put them in the wall. The plaintiff's view was that he, wanting the scaffolding for the purpose of his work, the defendant's foreman gave Nichols instructions to put it up, and the latter got the plaintiff's man to assist him. On the other hand, the defendant said that it was the duty of the defendant to erect the scaffolding.

Lord Justice Mathew: This was a question of fact of a simple kind, and I understand the learned judge found it against you—that it was your duty to erect this scaffolding. Mr. Disturnal: I submit there was reasonable evidence to support the learned judge's finding. It was admittedly the duty of the defendant to supply this material which caused the accident. Even though it was the duty of the plaintiff to erect the scaffolding out of the material supplied by the defendant, it was necessary for the learned judge to decide whether the plaintiff had been guilty of contributory negligence. He never considered that point at all. What the learned judge decided was this. He said it was the duty of the plaintiff to erect the scaffolding out of materials supplied by the defendant, that man did erect it, and therefore that the plaintiff was responsible for that, and he could not attribute his injuries to the defendant. The plaintiff said his contract was to do the plastering, and to use the scaffolding which was on the building. The defendant said it was the duty of the builder to supply scaffolding and erect it, but in order to get rid of a *prima facie* duty which arose from his contract to erect the scaffolding, he sought to draw distinction, which he said depended upon scaffolding custom, between what he called scaffolding and staging. The defendant said: "Although I am bound by my contract to erect scaffolding, yet a putlog is not part of scaffolding, but is part of the staging which, by the custom of the trade, it is the duty of the sub-contractor to put up." Upon that the learned judge found against the plaintiff. That custom was never suggested before the trial, and it was never put to the client. He was never asked specifically whether there was any such trade custom that. All he was asked was as to what had been his practice under other contracts he had. When the defendant got into the box, he stated there was such a general custom, that it was the duty of the builder to supply materials, and the duty of the sub-contractor to erect the scaffolding, and his duty to do the putlogs.

The Master of the Rolls: There is abundant evidence to show that the defendant filled his contract to supply material for the purpose of the scaffolding.

Mr. Disturnal said it was a breach of contract on the part of the defendant to leave 15s. about the place a piece of timber which was improper to be used for scaffolding.

Lord Justice Mathew disagreed with submission.

Mr. Disturnal argued that, the case had been properly tried, and said it ought to be sent back for a new trial.

Mr. Matthews followed on the same side. The Master of the Rolls, without calling upon counsel for the respondent, in his judgment, said he thought there was evidence to justify the learned judge finding as he had done. In his opinion there was no evidence of liability on the part of the defendant for what had happened.

The Lords Justices concurred, and the appeal was accordingly dismissed, with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

16,221 of 1903.—F. M. MCLARY: *Apparatus for Coating, Dressing, Moulding, or Dyeing Metal, Stone, or the like, and for Analogous Operations.*

This relates to a machine, the arrangement consisting in the combination with the slides and saddles, and parts for carrying tools, or tool holders, and the portion of frame necessary to carry the same, of means for traversing, independently of the main slide of the machine, the main slides, saddles, or part carrying the tools, or tool holders, which means for enabling the material to be operated upon in lines corresponding to the line travel of the table whether or not the counterbalancing arrangement be used in combination therewith.

22,725 of 1903.—J. H. WHITTINGTON: *Appliance for Forward Drying of Bricks, the like, in Continuous Downdraught Kilns.*

An appliance provided with grates near the bottom of the large chamber on which the rests and means being so arranged that heat of the products of combustion generated in the appliance are drawn first upwards through the opening into the small chamber and thence downward through feed holes in the kiln for the purpose of heating or drying.

22,801 of 1903.—THE MISERO FOUNDRY COMPANY, LTD., and G. H. BOARDMAN: *Bull-Head Fire Grates.*

This invention applies mainly to barless fire grates.

* All these applications are in the stage in which opposition to the grant of Patents upon them may be made.

places which are fitted with splayed tile panels either slatted or fixed in a metal frame. A raised platform extending to these splayed panels forms the top cover of a chamber containing a siphon, the front of which chamber is formed by a movable vertical panel or plate fitting up to the platform and extending to the full opening of the splayed panels. The above-mentioned platform forms the front part of the well, containing the fire, and the admission of air to the chamber below it can be controlled.

27,271 of 1903.—J. RUSSELL: *Means of Joining Together Pipes, Rods, and the like.*

Means of joining together pipes, rods, and the like, consisting of screw threads of different diameter and different pitch, formed upon the contiguous and portions of the respective members to be united, and a union socket having its opposite end portions threaded to screw upon said threaded end portions of the respective members, with or without a washer or packing ring of compressible material interposed between the contiguous extremities of said members.

27,338 of 1903.—R. W. HORDEN: *Method of and Means for Constructing Staircases.*

A method of constructing fireproof staircases, consisting of the employment of trough-shaped cast-iron plates which are first placed in position to form the staircase, and then filled with cement or other suitable material.

27,510 of 1903.—E. KOLBASSIEF: *Manufacture of Impermeable Blocks and Composite Structures from Cork, and other Material.*

A process for manufacturing impermeable material, consisting in sub-dividing a mass of suitable nature into any desired number of smaller parts, in coating subsequently each of these parts with a layer of impermeable substance, and finally in cementing them together in the required shape or form.

27,706 of 1903.—COMYNG CHING & CO., LTD., and W. THWAITES: *Ventilators.*

A perforated baffle plate or grating formed of plastic materials, for use in or as a ventilator, provided with holes which traverse the thickness of the plate or grating obliquely and have their area greater at one extremity than at the other, said holes being produced by pressing the material between dies having projections adapted to enter the thickness of the plate, and to co-act with one another from opposite sides thereof.

28,463 of 1903.—S. OLIVER and HATERSLEY BROTHERS, LTD.: *Kitchen Fire Ranges.*

Kitchen fire ranges, consisting in the combination with a hinged grate, of a pivoted ratchet lever comprising a forward operating arm, and an inner toothed engaging arm, whereby the grate may be adjusted to different heights vertically.

28,469 of 1903 S. OLIVER and HATERSLEY BROTHERS, LTD.: *Kitchen Fire Ranges.*

Kitchen fire ranges, consisting of a bar frame provided with horizontal projections on its inner sides, and outstanding vertical ribs on its front faces, in combination with a separately-constructed shelf formed with rear projecting arms having engaging recesses formed in their outer sides adapted to take on the projections, said shelf being also formed with recesses in its rear edge adapted to take over the ribs.

28,493 of 1904.—J. GARDNER: *Chimney Tops or Ventilators.*

Chimney pots or ventilators in which there is a hood placed some little distance above the terminal of the chimney pot, and a pair of flaps hinged to this hood, and connected rigidly with each other, the whole being arranged in such a manner that while there is plenty of exit for the smoke or foul air the hood at the highest point and the flaps below cover the crevices and prevent the wind from entering the chimney.

28,505 of 1904.—J. WELLS and J. JACKSON: *Machinery for Grinding Slurry, Applicable also for Grinding other Substances.*

A machine for grinding slurry or other substances, comprising a rotating cylinder, the inner periphery of which is formed with a number of troughs or gutters, and a series of grinding discs of a shape and size such that they roll freely in the troughs.

28,021 of 1904.—R. C. MATHEWSON and G. ANDERSON & CO., LTD.: *Apparatus for the Dressing and Moulding of Stone, Marble, and other like Materials.*

An apparatus for the dressing and moulding of stone, marble, and other like materials, consisting of a reciprocating table, to which is pivoted a top table which can be made to vibrate by means of a lever pivoted to such reciprocating table, the one extremity of the

lever working in a guide in the top table, while the other extremity slides backwards and forwards in an adjustable guide which can be set at any desired angle, the tools for cutting the material being mounted on a side standard, such tools being capable of cutting both forwards and backwards, of being adjusted to move towards or away from the material being operated upon or upwards or downwards as may be found desirable, the combined movements allowing of the stone being cut in a convex, a concave, or in a straight surface.

8,705 of 1904.—J. P. O'DONNELL: *Sand Screening and Shaking Apparatus.*

A sand screening or shaking apparatus in which a vibratory movement is imparted to the screen or sieve by the reciprocation of a piston or plunger directly attached thereto whose movement is controlled by a fluid-actuated piston valve which alternately admits fluid pressure to and exhausts it from either end of the cylinder in which said piston or plunger works.

16,975 of 1904.—J. M. McDOWELL: *Machines for Moulding Building Blocks.*

A machine for moulding building blocks, consisting of a frame, a bed-plate movable within the frame, means guided by the frame and supporting the bed-plate for moving the same, means for moving the supporting means, means for pivotally supporting the frame whereby it may be tilted, and means for locking the frame in position.

18,410 of 1904.—F. NORDMANN and F. SAUERLAND: *Water-closets.*

A water-closet installation, frost-proof, and without stagnant water, in which the inlet pipe opens into a two-way valve placed behind the water-closet seat. When the water-closet is used this valve admits the water to the flushing cistern placed a little above the seat, and after use causes the water still left between the two-way valve and the flushing cistern to run off into the drain in such a way that each time the water-closet is used the weight applied to and removed from the seat produces, through the agency of a suitable system of levers, the filling and complete emptying of the pipes and the flushing cistern, the parts exposed to frost.

18,895 of 1904.—D. DOYEN: *Extensible Railings, Gates, and the like.*

This consists in the use of levers joined together in the form of trellis work so as to form lozenge-shaped parallelogram-shaped openings in the construction of extensible railings, doors, gates, and the like.

19,438 of 1904.—J. W. LEADLEY: *Seats for Water-closets.*

A water-closet, consisting in the combination with a back rail integral with the pedestal, of bushed pockets in said back rail, projections on the seat, and pins or studs passing through the projections and into the bushed sockets to form the pivot for the seat.

28,317 of 1903.—J. H. CUTTELL: *Apparatus for Moulding or Casting Paving Slabs, and the like.*

This relates to moulding or casting paving slabs, and the like, and consists of apparatus for causing the plastic substance to settle in the mould, comprising a frame or stand, a table loosely mounted upon said frame, a pair of horizontal shafts geared together and provided with lifters or their equivalent, adapted to alternately raise and let fall the table upon which the mould-box is placed, a heavy metal plate mounted at the end of an arm attached to a vertical shaft, means for raising said plate, and means for swinging said plate clear of said table.

19,132 of 1904.—J. LENNON: *Excavating Apparatus.*

An excavating apparatus, comprising a receiving truck and a transmitting truck, the receiving truck having means for supporting a load, and having its truck frame constructed to permit the transmitting truck to be run completely through it, below the load supported thereby.

20,260 of 1904.—F. SHAY: *Cleansing Openings for Drains, and the like.*

This consists, in the combination with the ferrule, having at its upper end a cap providing an interior downwardly-facing valve-seat, of a float valve, and a valve support, comprising bent wires arranged diametrically of the ferrule, and having their ends journalled in perforations in the walls thereof, said wires being notched to receive each other in final position.

20,281 of 1904.—G. F. RYAN: *Soil Pipe Fittings.*

This consists, in the combination with a main sewer conduit, of a sewage branch and a revert branch both entering the sides of said main

sewer conduit, said revert branch having its opening into said main sewer conduit arranged with the lower portion of its wall at said opening within the path of flow from said sewage conduit, whereby the interior of the end of the revert branch is flushed by the discharge from said sewage branch.

20,322 of 1904.—G. BARKER (Perfect Sewer Trap Main Company): *Sewer Traps or Valves.*

This consists in the combination of a valve casing provided between its ends with a reduced portion having a valve-seat, having a groove flared from bottom to top, and a valve located in said seat having a body portion shaped to conform to the valve seat, whereby a tight fit is produced between the same.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

November 5.—By SEDGWICK, SON, & WALL (at Watford)	
Hunton Bridge, Herts.—Premises lately used as gas works, 1, p.	£260
November 10.—By TOOTELL & SONS (at Maidstone)	
East Peckham, Kent.—"Hall Place Farm," 16 a. 2 r. 22 p. l.	1,300
A plot of freehold land, 2 a. 1 r. 30 p.	150
Meadow and woodland, 8 a. 1 r. 8 p. l.	300
"Manor Field," "Buckhurst Field," and "Lord's Mead," 18 a. 3 r. 18 p. l.	400
"Hale Cottage," f.	540
November 11.—By HARRY BALL (at Bedford)	
Bedford.—1 to 15 (odd), Little Thurlow-st., l. w. r. 83. 1/2, 61.	988
2, 4, and 6, Little Thurlow-st., l. w. r. 32. 10s.	420
Thurlow-st., freehold stabling and coach house, y. r. 10s. 10s.	130
November 14.—By KEMSELEY'S	
Woodford Green, Essex.—"SNAKES-LA," "Oakley," f. or. 45l.	570
Chigwell Row.—Hog Hill, freehold building land, 2 a.	400
Romford, Essex.—Hog Hill, freehold building land, 2 a.	170
Chadwell, Essex.—Romford-road, a block of building land, f.	1,500
By E. W. & H. O. POTTER	
Hampstead.—106, Heath-st. (s.), l. p.	1,400
By P. W. TALBOT & CO.	
Pimlico.—Ebury-st., l. gr. 10l., u. t. 18 1/2 yrs., g. r. nil.	110
Brompton.—Felliam-pl., l. gr. 40l., u. t. 18 1/2 yrs., g. r. 2l.	110
Ovington-sq., l. gr. 60l. 10s., u. t. 19 1/2 yrs., g. r. 22l.	470
Portman-square.—DUKE'S MEWS, l. gr. 60l., u. t. 2 1/2 yrs., g. r. 20l.	490
Regent-street.—Nos. 313 and 315, l. gr. 63l., u. t. 18 1/2 yrs., g. r. 10l. 2s. 6d.	730
Hampstead-road.—Robert-st., l. gr. 38l., u. t. 12 1/2 yrs., g. r. 12l.	295
By WILKINSON, SON, & WELCH (at Brighton)	
Brighton.—71, Beaconsfield-villas, l. p.	1,100
Nov. 15.—By DAVID BURNETT & CO.	
Commercial-road East.—37, Dean-st. (b. h.), u. t. 60 1/2 yrs., g. r. 15l., y. r. 35l.	410
By DEBENHAM, TEWSON, CO.	
Bushey, Herts.—High-st., the Herkmer School of Art and 1/2 an acre, l. p.	1,300
An antique oak ferrous.	650
Carved oak raised paneling in studio.	220
By E. H. HENRY.	
Chislewick.—1A, Blenheim-rd., u. t. 77 yrs., g. r. 14l., p.	1,010
By MARTIN, WHITE, & CO.	
Sydenham.—37 and 39, Champion-pk., u. t. 75 1/2 yrs., g. r. 12l. 12s., y. r. 60l.	350
By HEPPER & SONS (at Leeds)	
Leeds.—Newton-rd., "Newton Green Hall Estate," 14 a. 2 r. 24 p. l.	7,000
Harrogate-rd., "Laurel Bank," 1 a.	1,700
By MADDISON, MILES, & MADDISON (at Halesworth)	
Bramfield, Suffolk.—Two freehold houses, with shop, making farm buildings, etc., area 1a. Freehold house and 0 a. 3 r. 30 p.	660
"Scott's Hall" (house) and 0 a. 1 r. 29 p. f.	118
By MORLEYS' (at Mason's Hall Tavern)	
South Kensington.—152, Earl's Court-rd. (the Earl's Court Restaurant), u. t. 17 yrs., y. r. 200l. with goodwill.	510
November 16.—By BISLEY & SONS.	
Old Kent-rd.—5 to 23 (odd), Trafalgar-rd. ("Scott's-ter."), u. t. 69 yrs., g. r. 100l., y. r. 450l.	3,000
Peckham.—Radnor-st., l. gr. 64l. 16s., u. t. 36 yrs., g. r. 11l.	880
Rotherhithe.—15 and 16, Matsou-st., u. t. 41 yrs., g. r. 3l. 10s., w. r. 4l. 12s.	270
By H. DONALDSON & SON.	
Islington.—7, Prospect-pl., l. c. 39l.	350
Hoxton.—35, Bookham-st., u. t. 30 yrs., g. r. 5l., y. r. 36l.	270
15, 16, and 17, Napier-st., u. t. 2 1/2 yrs., g. r. 10l. 10s., y. r. 94l.	180
Dalston.—122, Forest-rd., u. t. 46 yrs., g. r. 7l. 3s., g. r. 45l.	415
By C. P. WHELFLEY.	
Batham.—20, 28, and 32, Henderson-rd., u. t. 83 yrs., g. r. 30l., y. r. 155l.	1,455
By BALLARD & MARSH (at Teddington)	
Hampton Court, Middx.—Main-rd., a freehold building site.	290
Teddington, Middx.—1 to 4, Regent's-cottages, l. w. r. 50l. 14s.	470
5, Regent's-cottages (s.), l. w. r. 10l. 10s.	270
By FOX & VERGETTE (at Sandy)	
Willington, etc., Beds.—Portions of the Copie and Willington Estate, 228 a. 2 r. 0 p., f. (in lots).	8,190

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Requirements.	Names by which invited.	Designation of the Authority.
Library Buildings, Links-place, Burntisland	Burntisland Town Council	Not stated		Dec. No. da
*Proposed Northumberland War Memorial	Committee			

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tender to be Delivered by
Stores	Swansea Harbour Trust	Engineer at Harbour Office	Nov. do
Paving with Granite Setts Tramway Margins	Devonport Town Council	J. E. Burns, Borough Surveyor, Municipal Offices, Devonport	do do
Constable's House at Tynmilt	Argyle County Council	F. O. Barrow, Council Offices, Barker's-lane, Ashton-upon-Mersey	do do
Alters, etc., Council Schl., Waverley-rd., Small Heath	Birmingham Education Committee	A. Rowse, Surveyor, 117, Colmore-row, Birmingham	do do
Entrance of Council School, Jenkins-st., Small Heath	do	do	do do
Counter & Showcase, Dewsbury-rd., Branch Library	Leith Town Council	Burgh Surveyor's Office, Charlotte-street, Leith	Nov. do
Slating Pond, Rothes	Leeds Corporation	City Engineer's Office	do do
Stores	Bombay, etc., Central India Ry. Co.	A. Robb, Burgh Surveyor, Rothes	do do
Seaverging	Ashton-upon-Mersey U.D.C.	T. W. Wood, Sec., Gloucester Hse., Bishopsgate-st. Without, E.C.	do do
320 yds. of 9-in. Stoneware Pipe Sewers, Sydney-rd.	Walton-on-Thames U.D.C.	R. Wilds, Engineer, Council Offices, Walton-on-Thames	do do
Street Work, Swindon	The Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon	do do
Road Works, St. Ives-road	Maldenhead Town Council	P. Johns, Borough Surveyor, Guildhall, Maldenhead	do do
Seaverging, Houghton Regis	Luton R.D.C.	W. Austin, 7, George-street West, Luton	do do
Sewerage Work, Rathfrum, Ireland	R.D.C.	G. T. Moore, C.E., 1 and 2, Foster-place, College-green, Dublin	do do
Elementary School near East-street	Eastbourne Corporation	F. G. Cooke, 2, Hyde-gardens, Eastbourne	do do
Repairs to Leuchars School	Elgin Highways Committee	J. Wittet, Architect, Elgin	do do
Road Metal	do	A. Rogg, Surveyor, 24, Academy-street, Elgin	do do
Painting, etc., at Dispensary, 43, North-st., Plymouth	Waterloo with Seaford U.D.C.	W. Adams, 43, Princess-square, Plymouth	Nov. do
Road Works, Waterloo, etc. (Contract 1)	do	F. Spencer Yates, Surveyor, Town Hall, Waterloo, Liverpool	do do
Road Works, Waterloo, etc. (Contract 2)	do	do	do do
Tramway, Old-street, etc.	Ashton-under-Lyne Tramways Com.	J. T. Earnshaw, Boro. Surveyor, Town Hall, Ashton-under-Lyne	do do
Electric Lighting of Old Nurses' Home, Withington	Chorlton Guardians	G. R. Peers, Architect, Westgate-chambers, Newport	do do
Twenty-eight Dwelling Houses, New Main-road	Aberbargoed Estates, Ltd.	G. Kenbale, Architect, Bargoed	do do
Shop and Dwelling House, New Main-road	do	do	do do
Painting, etc., of Hunslet Baths	Leeds Corporation	City Engineer's Office	do do
Public Library, Brynmaur	Free Library Committee	do	do do
Dock Bridges	Southern Maritime Railway Co.	Secretary, 46, Queen Anne's-gate, S.W.	do do
Steel Rails and Fish Plates	do	do	do do
Wrought-Iron Dog Spikes	do	do	do do
Steel Sleepers and Keys	do	do	do do
Laying out Ground, etc.	S. Staffordshire Smallpox Hosp. Bd.	G. Green, Engineer, Town Hall, Wolverhampton	do do
Cowshed, Dairy, etc., Bradley, near Bilston	do	do	do do
Repairs to Wesleyan Chapel, Flamborough	The Trustees	S. Dyer, Architect, 23, Quay-road, Bridlington	do do
Council School, Southwater, Sussex	West Sussex County Council	F. Wheeler, F.R.I.B.A., Bank-chambers, Carfax, Horsham	Nov. do
Mortuary at Infectious Diseases Hospital, Bucknall	Hanley, etc., Hospital Board	Eliph Jones, Architect, 10, Allport-street, Hanley	do do
Water Storage Tank	do	do	do do
Cast-Iron Pipes, Special Castings, etc.	Birmingham Water Committee	E. Antony Lees, Secretary, 44, Broad-street, Birmingham	do do
Repairs, etc., Fellislife Provided School	West Riding County Council	West Riding Committee Offices, Town Hall, Leeds	do do
Steel Boiler Plates, etc.	East India Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do do
Paints, etc.	do	do	do do
Wrought-Iron Piping	do	do	do do
175 yds. of Unclimbable Iron Fencing	Farnham Guardians	Master of Workhouse	do do
Making-up Roads, Little Thurrock, Essex	Great R.D.C.	F. Lowry, A.M.I.C.E., Hornchurch	Dec. do
*Alterations, etc., Grand Aquarium and Winter Gdns.	Brighton Borough Council	W. C. F. Gillam, Arch., Central-chbrs., 3, North-st.-quad., Brighton	do do
Gunmetal Ingots	Burma Railways Co., Ltd.	A. G. Begbie, 76, Gresham House, Old Broad-street, E.C.	do do
Beater Picks and Plovers	do	do	do do
Copper Inroils	Gravesend Town Council	Borough Surveyor's Office, Town Hall, Gravesend	do do
Making-up Havelock-road	Ruislip-Northwood U.D.C.	E. R. Abbott, Clerk, Northwood, R.S.O., Middlesex	do do
Broken Granite, Gravel, and Spitzing	Salford Water Committee	L. C. Evans, Town Clerk, Town Hall, Salford	do do
200 Socket and Spigot Pipes (3-inch)	do	do	do do
300 Socket and Spigot Pipes (4-inch)	Bolton Corporation	E. L. Morgan, Borough Engineer, Town Hall, Bolton	Dec. do
Hacken Sewage Works Extension (Contract No. 1)	Welton R.D.C.	Mr. Gilbert, Inspector of Nuisances, Welton-by-Lincoln	do do
Seaverging for Nettleham	Messrs. Burns	30, Jamieson-street, Glasgow	do do
Stores	Steyning West R.D.C.	F. Slughter, Engineer and Surveyor, High-street, Steyning	do do
Hacken Sewage Works Extension (Contract No. 2)	Glasgow and South-Western Ry. Co.	Engineer to Company, St. Enoch Station, Glasgow	do do
Rebuilding, etc., of Eschme Bridge, near Wessath	Dublin United Tramways Co.	Secretary, 9, Upper Sackville-street, Dublin	do do
Rebuilding Widdale Head Bridge, near Haves	Worsley U.D.C.	J. A. Corson, Engineer and Surveyor, District Offices, Walkden	do do
*New House at Greenock	Newcastle-on-Tyne Finance Com.	M. Fitzmaurice, Engineer, County Hall, Spring-gardens, S.W.	Dec. do
Public Conveniences, George's-square, Halifax	London C.C.	Engineer, Public Health Department, Guildhall, E.C.	do do
Stores	Corporation of London	W. Farrington, Surveyor, Council Offices, Woodford-green	do do
Telegraph Stores	Woodford U.D.C.	do	do do
Five Tip-Wagons	Brentford U.D.C.	Connell's Surveyor, Boston-road, Brentford	do do
Sanitary Fittings for Public Conveniences	Corporation of London	Engineer, Public Health Department, Guildhall, E.C.	do do
Lavatory in Duke-street, at Cattle Market	Tottenham U.D.C.	Council's Clerk, Council's Offices, 112, High-road, Tottenham, N.	Dec. do
Store at Free Wharf, Shoreham	Dublin Port and Docks Board	Secretary, Port and Docks Office, Westmoreland-street, Dublin	do do
Drainage of Bouth, Ulverston	do	Y. From Port and Docks Office, Westmoreland-street, Dublin	do do
Lossiemouth Waterworks	Guardians	G. E. Bond, Architect, Pier-chambers, Chatham	do do
School	Blackpool Highway Committee	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do do
Wetwyn Sewage Disposal (Contract No. 1)	Birmingham Public Works Com.	J. Price, City Engineer, Council Offices, Birmingham	do do
Steps at Trinity-street to Anchor-road	Malling R.D.C.	C. Souter, Inspector of Nuisances, West Malling	do do
Surface Water Drain, etc., Lancing	Kilmarnock District Committee	J. Sturrock, jun., Engineer, 65, King-street, Kilmarnock	do do
Dredging at Tross Harbour	Manchester Corporation	City Surveyor, Town Hall, Manchester	do do
Stores	Borough of Fulham	Borough Surveyor, Town Hall, Fulham, S.W.	do do
Retain. Walls, etc., Worsley Brow, etc., Road-widening	Woking U.D.C.	G. J. Woodridge, Arch. and Surv., Bank Chambers, Woking	Dec. do
Painting, etc., Byker Baths, etc., Shipley-street	Chatham Corporation	C. Day, Borough Surveyor, Town Hall, Chatham	do do
Three Main-Driving Gas Engines, York-rd., Battersea	Mr. W. H. C. Thurman	F. Malby, Architect and Surveyor, South-street, Dorchester	do do
Various Works	Baling Town Council	Borough Engineer, Town Hall, Baling, W.	do do
Road Works, Main Roads	Commissioners of H.M. Works, etc.	J. Wager, H.M. Office of Works, Storey's-gate, S.W.	do do
Road Works, other Roads in District	do	do	do do
*Supply of Broken Granite	do	do	do do
*Carps, Plumbers' Patrs., Smiths' Engrs., Job Wk.	do	do	do do
*Sinking Well and Borehole, etc., at New Baths	do	do	do do
Paving Setts	do	do	do do
Corfage	do	do	do do
Re-roofing at Workhouse, Strood	do	do	do do
950 yds. of Ornamental Railing	do	do	do do
1,310 yds. of Brick	do	do	do do
800 yds. of Pipe Storm-water Sewers, etc.	do	do	do do
Seaverging, Woolham	do	do	do do
Hurdfor, etc. Waterworks	do	do	do do
*Plant for Manufacture of Artificial Paving	do	do	do do
*Making-up Wood Lawn-road (Section II.)	do	do	do do
Public Offices, Commercial-road, near Station	do	do	do do
Stores	do	do	do do
Alterations to No. 17, South-street, Dorchester	do	do	do do
*Making-up Roads, etc.	do	do	do do
*Enlargement of Eastern District Post Office, London	do	do	do do

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be Delivered. Includes entries for iron steam buoys, electrical travelers, and various building contracts.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Includes an entry for Assistant Civil Engineers.

Those marked with an asterisk (*) are advertised in this number. Competitions, iv. Contracts, iv, vi, viii, x. Public Appointments, xix.

TENDERS.—Continued from page 561.

Table of tenders for building work, including items like Knight & Son, J. & M. Patrick, and others, with amounts and dates.

Table of tenders for Queen's Jubilee Hospital, West Epsom, and other projects, listing architects and amounts.

Table of tenders for the enlargement of the sorting office at East Croydon, listing various contractors and amounts.

Table of tenders for Hackney, N., Wordsworth-road, listing contractors like H. Runham and amounts.

Table of tenders for Islington, E., and other areas, listing contractors like G. S. S. Williams and amounts.

LONDON BOARD OF EDUCATION TENDERS.

Table of tenders for cleaning schools during the Christmas holidays, listing contractors like Clapham, Haselrigge-road.

Table of tenders for Westminster, Horseferry-road, listing contractors like F. G. Minter and amounts.

Table of tenders for Malvern, listing contractors for a public library, including Mr. H. A. Crouch.

Table of tenders for London County Council, listing contractors like A. H. Marshall and amounts.

Table of tenders for London and County Builders, Ltd., listing contractors like Kent and amounts.

MERTHYR (Wales).—For erecting two shops and dwelling appurtenances in High-street, for the Trustees of Pontmorris Chapel:—
 J. Jenkins £1,951 M. Warlow, Warlow-street, Merthyr* £1,740
 S. Hawkins 1,750 E. Williams 1,890
 Jones & Davies .. 1,750 Jones 1,510
 J. Williams 1,745 E. Sullivan 1,126

MITCHAM (Surrey).—For clearing site and erecting a relief station and other's house, etc., Cranmer-road, for the Guardians of Croydon Union, Messrs. Chart, Sons, & Reading, architects:—
 Mile & Upson... £1,410 0 H. Lumsden .. 2982 0
 Ferguson & Co. 1,100 0 G. E. Everett.. 973 10
 Ltd. 1,098 0 E. Pearce 973 0
 Ballard & Co. 1,097 0 S. H. G. O. M. & W. Bowman .. 970 0
 Martin, Wells, & Co. 1,090 0 W. Bowman .. 965 0
 Smith & Sons... 1,070 0 E. J. Burnard... 958 0
 R. Jones & Son 1,054 0 Truett & Steel 955 0
 Grace & Marsh 1,020 0 Sedgewick Bros. 949 0
 C. E. Haydon... 1,019 10 H. Bacon 919 0
 D. Steward & Sons .. 1,018 10 Powell & Pitt.. 910 0
 D. Waller 998 0 Burgess & Sons 890 0
 Foster Bros. ... 993 0 C. S. Sayers, High-street, Mitcham* 887 0

RICHMOND (Surrey).—For 875 yds. of 9-in. sewers along Mortlake-road, North Sheen, for the Town Council, Mr. J. H. Brierley, Borough Surveyor, Town Hall, Richmond:—
 Ballaras, Ltd. £1,164 12 0 Benbau & Co. 2784 0 8
 G. Wimpey & Co. 874 17 3 Newell & Co. 7577 8 8
 C. W. Kibling-back & Co. 884 5 6 F. Hoffmann .. 724 14 2
 J. Jackson .. 855 10 8 Kavanagh & Co. 711 13 6
 E. Tabor ... 807 2 7 Surliton* .. 656 6 0
 T. Watson ... 739 2 4 J. Howell 656 6 0

SOUTH SHIELDS. For new operating theatre, for the Inham Infirmary, Westoe, South Shields. Quantities by the architect, Mr. Fred Renoldson, South Shields:—
 Sheriff & Sons £2,164 2 10 A. Ross... £2,092 9 6
 J. Carruthers 2,145 5 2 R. Harper... 2,076 7 3
 W. Wilson & T. Banks .. 1,951 15 10
 J. C. Nichol .. 2,144 6 10 T. W. Turner & Co. 1,961 12 5
 J. Young .. 2,128 17 0 J. Christie* 1,900 5 0
 W. J. Robertson & Sons 2,100 0 0

THATCHAM.—For erecting a bridge, 54 ft. by 18 ft., over the river Kennet at Thatcham, near Newbury, for the Berkshire County Council, Mr. J. Morris, County Surveyor, Broadway-buildings, Reading. Quantities by Mr. Morris:—
 A. Findlay... £1,669 3 0 G. H. Tucker 8881 0 0
 Cleveland Bridge Co. 1,231 11 6 Woods & Moir ... 880 0 0
 R. Moreland & Son... 1,108 0 0 T. James .. 860 0 0
 A. Thorne... 1,146 0 0 W. A. Baker & Co. 850 0 0
 A. D. Daway... 1,064 18 7 G. Thompson & Co. 850 0 0
 Fulham Steel Works .. 1,000 0 0 M. E. Pitt... 846 0 0
 E. C. & J. Keay ... 912 0 0 A. J. Ellis... 824 18 0
 E. Finch & Co. 894 12 10 J. O. Brettell 779 0 0
 J. Westwood 890 6 3 Needham & Lowe 771 12 0
 J. Coulson, Stokes, & Co. 890 0 0 C. W. Cox & Sons, Maidenhead* 746 0 0

B. NOWELL & Co.,
 Stone Merchants & Contractors.
 Chief Office, —Warwick Road, KENSINGTON.
 Norway, Guernsey, and Leicestershire Granite, Kerb, Pitching, and Yorkshire Stone.
 ESTIMATES GIVEN FOR EVERY DESCRIPTION OF ROAD MAKING.

TRURO.—For sea-wall works, etc., for the River Committee, Mr. Meaham Lea, City Surveyor, Truro:—
 G. Lawson £18,687 0 0 W. E. Blake £4,920 0 0
 T. Rieckard 4,882 6 0
 T. H. Dredging & Contracting Co. 6,629 13 11 J. Collyer .. 4,771 3 0
 E. H. Page 5,919 9 0 Truro* .. 4,255 1 3
 Pethick Bros. 5,619 0 0 Ellacott & Sons 3,495 14 0

WELLS.—For 9-in. bore, 350 ft. deep, near Wells, for the Committee of Somerset and Bath Asylum, Mr. W. Phelps, C.E., Croscombe, Wells:—
 Steel tubing per ft. s. d. s. d.
 W. Brown & Son £732 10 .. 12 0
 Cheeld & Co. 637 10 .. 15 0 to 32 6
 T. Trigg 609 0 .. —
 Duke & Ockenden ... 587 10 .. 7 6
 C. Chapman & sons... 450 0 .. 14 0 to 19 0
 E. Timmins & Son ... 450 0 .. 10 0 to 13 6
 J. Henderson & Son .. 437 10 .. 10 6
 T. Matthews 490 0 .. 17 0 to 22 0
 A. C. Potter & Co. ... 329 0 .. 6 0
 W. Matthews & Co. ... 310 0 .. 7 6 to 8 6
 H. Brown & Co. 290 0 .. 13 6
 C. Iser & Co. 290 0 .. 12 0
 British American Well Works 218 15 .. 5 8
 2 in. thick. 2 in. thick.

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The Builder.

VOL. LXXXVII.—No. 3226.

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ILLUSTRATIONS.

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New Public Baths, Chelsea.....	Messrs. Wills and Anderson, Architects.
New Church, Spiddal, Co. Galway	Mr. W. A. Scott, A.R.I.B.A., Architect.
The Mill House, Aldeburgh	Mr. E. A. Briggs, F.R.I.B.A., Architect.

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Reinforced Concrete.



IN a series of articles published last year, we set forth some of the more important facts relating to the new building material, consisting of concrete and steel combined in

such a manner as to present distinctive characteristics of the greatest value to architects and constructional engineers. The employment of this material in such a manner as to meet the varying requirements of every-day practice requires something more than a familiarity with the properties of concrete and steel, for the designer must be qualified to analyse the stresses established or likely to be established in every part of the structure under consideration, and to apply the results obtained by recent investigation when calculating the proportions of the various members as well as the relative proportions of the two constituents, and the exact disposition of the steel reinforcement. Finally, he must be imbued with complete confidence in the strength, stability, and durability of the structure designed. As in other departments of constructive work, such confidence comes only with knowledge, based on theory and confirmed by practice. We may add the remark that if theoretical knowledge is itself founded upon observed facts, as it actually is in every branch of constructional science, there is an additional

reason for accepting theory as a reliable guide.

Much still remains to be learned with regard to the remarkable properties of concrete when reinforced by steel. Considerable and other eminent European scientists are still pursuing their investigations, and, as we pointed out in a recent "Note," an influential joint committee has been appointed in the United States for the purpose of collecting facts and formulating conclusions. In this country, architects and engineers alike appear to remain in a state of expectancy, and are making no effort to throw light upon this most interesting subject. A recent work by Mr. Charles F. Marsh* is particularly welcome at this juncture, and the comprehensive review of reinforced concrete therein presented cannot fail to stimulate interest in a material whose practical utility is beyond question. This treatise, including 530 quarto pages, obviously represents an enormous amount of labour, and, as a summary of information hitherto to be found only by the laborious process of searching through sundry foreign treatises, the proceedings of sundry engineering institutions in various parts of the world, and innumerable articles in technical journals published in Great Britain, the Continent, and the United States, it ought to be widely appreciated by architects and engineers who desire to make a systematic study of reinforced concrete construction.

* "Reinforced Concrete," by Charles F. Marsh, A.M.Inst.C.E., A.M.I.Mech.E., with 512 illustrations and diagrams. London: Archibald Constable & Co., Ltd. 1904.

In Part I. the author gives a good "General Review of the Subject," and, among other questions, refers to the history of reinforced concrete, its limited employment in England, and its advantages and disadvantages. Regret is expressed "that engineers and architects in England are so conservative, one might almost say prejudiced in their ideas, that many of them will not use this form of construction, even though their Continental and American *confrères* have proved to them so clearly its usefulness and economy, and, above all, its safety." We quite agree with these remarks and believe that in this particular respect engineers are even more conservative than architects. But the fact must not be overlooked that reinforced concrete can never come into general use until our building regulations, and especially the Metropolitan Building Act, are amended so as to permit the economic possibilities of the material to be fully developed. So long as building rules continue, for some purposes, to base the proportions of structures upon the strength of brickwork, so long will the use of superior material be retarded, and progress stifled. While dealing with this point, Mr. Marsh refers to the regulations which govern building construction in several Continental and American cities, and shows that intelligent recognition is therein made of the modifications rendered possible by the employment of reinforced concrete.

Under the sub-heading entitled "Advantages and Disadvantages in the Use of Reinforced Concrete," the reader

will find a good deal of useful matter. The fire-resisting qualities of reinforced concrete are emphasised by official reports, which have already been printed in an excellent trade catalogue known to many of our readers. This testimony, although reliable, is somewhat old, and, even assuming that the conclusions deduced from the great Baltimore fire were not available until after the author's pages were in type, some records of more novel character could have been given with advantage. An important point made, however, is that, even after exposure to severe fire and water tests, the elasticity and strength of reinforced concrete is practically unimpaired. The immunity of the reinforcing metal from rust is clearly a meritorious characteristic, which is demonstrated by several investigations quoted in this section of the treatise. Various opinions have been expressed as to the imperviousness of the new material by water. For details of some of these we must refer the reader to the work itself. The author again quotes largely from the catalogue before-mentioned, repeating data obtained as long ago as 1886 in the city of Grenoble, but the evidence is of little assistance in a general way, the most valuable guidance being afforded by the statement that where resistance to the penetration of water is required, "the concrete should be of sand and cement only, and in proportions not more than three to one." We may add that it is frequently desirable to finish the surface of water-tanks and similar structures with a rendering of neat cement. So far as concerns durability, the statement that "reinforced concrete compares very favourably with steel and iron structures" certainly does not err on the side of exaggeration, for, apart from the constant painting and supervision required by steel structures, we have no reason to believe that they can possibly endure for periods anywhere approaching those attained by works in simple concrete. So far as reinforced concrete is concerned, sufficient evidence is afforded by pieces of iron embedded in lime concrete hundreds and even thousands of years, that the life of the combined material is not likely to be limited by destruction of the metal. Several other points relative to reinforced concrete are discussed in the general review made by the author. All of these are of importance, but in view of the voluminous records awaiting attention in succeeding parts of the work we cannot notice them individually. We must, however, take exception to the suggestion that the work of designing may advantageously be restricted to those who are interested in the different systems of reinforced concrete construction. Our view is that architects ought to make it their business to master the principles involved, so that they may be able to apply reinforced concrete freely and confidently, as timber, brick, and stone have been applied in the past, for the realisation of architectural conceptions. So long as the mind of the designer is fettered by the requirements of another intelligence, it will be impossible to obtain really satisfactory results. In other words, if the new material is to achieve the success it deserves in artistic building

construction, the architect must learn to think in concrete-steel as he has hitherto thought in brick and stone.

Part II, entitled "Systems Employed," is probably the most complete summary of the kind yet published. It includes detailed descriptions and illustrations of more than forty different patented systems of construction, of which thirty are of Continental, seven of American, and only one, we are sorry to say, of English origin. This analysis serves to demonstrate the backwardness of our own country, and, taken in conjunction with the fact that several of the Continental and American patentees have established agencies here, affords one more suggestion that we no longer aspire to lead the world in the way of progress, but are reluctantly dragged forward by more enterprising nations. Most of the information presented in the present part appears to have been collated from catalogues and pamphlets issued by the firms concerned, but it is no less valuable for that reason. Only a few of such publications find their way into Great Britain, and many of them, being published in foreign languages, are not so convenient for perusal as might be desired. The summary made by Mr. Marsh, although merely descriptive, will be found extremely useful for purposes of comparison, and should afford many valuable hints to the studious reader. Notwithstanding the numerous patents extant, the main principles of construction are not, and cannot be, protected, and, as a general rule, the valid patents generally rely upon comparatively insignificant details, and do not militate against the general use of reinforced concrete. One of the objections frequently raised against the adoption of this combination is the variable strength of concrete, which is affected not only by the quality of the cement, the character of the aggregate, and the proportions of the constituents, but also by the thoroughness of mixing. In practice, however, the variation of strength should be small if reasonable care be exercised, and if the mixing be performed by suitable machines.

In Part III, the author deals with the constitution and properties of cement, mortar, and concrete, giving data from a number of well-known authorities. He also includes a table showing the proportions of concrete as used for different classes of work by various reinforced concrete firms. While the proportions in question vary considerably, it will be seen that in some of the most reliable systems, 1 to 3 and 1 to 4 concrete are usually employed for beams and columns. Some general remarks by the author on this part of the subject will be found helpful to those requiring guidance as to the best proportions for adoption. Only a small space is devoted to "Reinforcing Metal." There is comparatively little to say about this constituent of reinforced concrete, as ordinary bars or rods are most generally employed. We observe that the author does not appear to be quite convinced as to the superiority of mild steel to wrought iron. For some special purposes wrought iron is still useful, but for ordinary structural work steel is far preferable, and, considering its greater strength and

uniformity of quality, far cheaper well as more reliable than iron. The advice that "when steel is at a low price than wrought iron it is always the better material to use" is somewhat curious reading, and, taken in conjunction with other passages in the paragraph relative to reinforcing metal, seem to indicate that the author's experience as a buyer and user of iron and steel has been of somewhat limited extent.

Part IV, on "Practical Construction," deals with methods employed in the erection of reinforced concrete structures. This part of the general subject will perhaps be more suitably placed in the two succeeding portions of the volume, but the point is not of great importance as the reader can easily skip and advance return to the present part. Under the sub-headings entitled "Moulding" and "Falsework," will be found a large amount of most instructive matter, the value of which is considerably increased by reproductions of sectional and plan drawings illustrating the methods adopted in the construction of columns, flues, beams, floors, arched roofs, and chimney shafts. Some of the details in the next two sections, the "Treatment of Reinforcing Metal" and "Special Reinforcements" are more or less repetitive of descriptions given in Part II, and some again would have been more appropriately placed under the previous sub-heading devoted to "Reinforcing Metal." Still, the descriptions will gain many useful hints from a careful study of the particulars furnished, and the methods adopted by various engineers for placing and inter-connecting the reinforcement, and in depositing the concrete.

The question of "Moulding in Advance" is one that deserves attention in connexion with many classes of reinforced concrete construction, not only in regard to bridges and structures, but also in the different members are, or should be, mutually dependent, the author is quite right in saying that "Moulding in Advance" should be universally adopted for important parts," for when moulded separately in advance, it is exceedingly difficult to insure proper connexion between the different members, and, further, unnecessary labour and expense would be incurred in packing, transporting, and handling heavy masses of finished material. Portions of any floor should be moulded in advance, for the beams, joists, and panels have all to be combined to form a perfectly homogeneous structure, the slabs actually constituting the ends of the compression flanges of the beams and joists. Similar considerations point to the desirability of constructing columns on the site, but it may be remarked that there are reasons for favouring the advance moulding of compression members, and the treatment is distinctly advantageous in the case of various details, such as lintels, sills, and portions that do not contribute directly to the stability of the structure as a whole. The advantages to be gained by moulding in advance are well summed up by the author as follows:—(1) It is more economical to mould beams, slabs, etc., in a shed than to cast false work. (2) The moulding can be carried on in all weathers, and

considerable saving in time. (3) There is more freedom and space where no falsework, or very little is employed, than with the mass of props, boxes, and staging rendered necessary when moulding *in situ*. (4) The erection can go on without intermission. (5) The structure will bear its final loading immediately the parts are in place. (6) The building up of the structure is greatly facilitated in consequence of the beams, slabs, etc., merely requiring lifting and placing in position. (7) The pieces can be tested, if required, before being placed in position." As stated above, the chief reason against the separate moulding of members in ordinary building construction is to be found in the difficulty of insuring absolute connexion between them when built together, but if this obstacle could be got over, the practice would have everything in its favour. The last two sections under the head of "Practical Construction" relate, one to the moulding of ornamental work and facings—a subject of special interest to architects—and the other to methods of forming the hinges in reinforced concrete arches of long span.

"Experimental Research and Data Deduced Therefrom" is a title which promises most interesting matter for study, and in Part V. Mr. Marsh clearly justifies anticipation of the kind. There is no finality in experimental investigation into the properties of reinforced concrete, and it is not to be expected that a volume of such portentous dimensions as that now before us should contain records of the most recent investigations. Still, Mr. Marsh is very nearly up-to-date, a result upon which he is to be congratulated. Some of the most noteworthy records presented in this part are those referring to the ratio between the coefficients of elasticity of concrete in compression and those of iron and steel, to the limiting stresses for concrete in compression and in tension, to the resistance of concrete to shear, to tests of reinforced concrete beams, and, finally, to the remarkable properties of "hooped" concrete columns, as recommended by the distinguished French engineer, M. Considère. The names of the investigators quoted as authorities by Mr. Marsh sufficiently vouch for the reliability of the data given. A suggestive recommendation made at the end of Part V., is that "the present method of treatment may not be the best, and that instead of resisting the stresses by placing bars or wires in such positions that they may take up the direct stresses, greater strength will be obtained by so placing the reinforcement, that instead of directly resisting the imposed stresses, they may always act in tension, the concrete being compressed, whatever the nature of the main stresses may be." The elaboration of this idea, which probably has been suggested to the author by the remarkable investigations of M. Considère, would lead to the design of members in such a way that swelling of the concrete might be resisted by the tensile strength of reinforcement disposed in rings, spirals, or netting.

Part VI., on "Calculations," may be regarded as the most important chapter in the entire volume. It is divided

into three portions:—I., Necessary Hypotheses; II., Loads, Bending Moments, Shearing Forces, etc.; and III., Formulae.

At the outset we must say that none of the many theories hitherto propounded are more than approximately correct. Some rules are expressed in the most approved mathematical form, and present a sufficiently terrifying appearance to practical men who have never wandered far into the intricacies of this fascinating branch of science, or to those who may have forgotten much of the knowledge acquired of it at school or college. Other formulæ are expressed in far more simple terms, and others again are purely empirical. At the present time, it is exceedingly probable that rules of the last-mentioned class may be quite as reliable as those stated in the most severely mathematical terms. Still, it is desirable that all formulæ should be expressed in correct form, with due account of all essential factors. Then, as further data are ascertained, the coefficients employed will simply require correction, and the results obtained will approach more closely to absolute accuracy than is at present possible. It is now necessary to make certain assumptions upon which to base calculations, and these are the hypotheses which form the subject of examinations in the first portion of Part VI. Among the usual assumptions several are admittedly inexact, and to those who desire information on the point we recommend a study of the opinions and arguments collected by the author. We may pass over the second portion of Part VI., as the subject matter is common to many text-books on applied mechanics. The reader ought to note, however, that the author reproduces a long extract from a paper by Mr. W. Dunn, F.R.I.B.A., published in the *Journal* of the Royal Institute of British Architects, on the bending moments on slabs. This subject has been very little discussed in treatises dealing with the strength of materials, and the references here made should be very generally appreciated.

The third portion of Part VI., consisting of some 125 pages, chiefly filled with formulæ and mathematical demonstrations, cannot well be discussed in any detail in this article. We must, therefore, be content to make a few remarks while passing over the pages in question. The author first deduces two general formulæ for members in direct compression, one for reinforcement consisting of small sections, and the other for reinforcement composed of large sections. Rules derived from Euler's formula are also given for checking resistance to flexure in the case of columns having a length of more than 20 diameters, and values of the co-efficient (k) are given, corresponding with different methods of fixing the ends of the members. Next, we have a discussion of columns in which longitudinal and hooped reinforcement are incorporated, the references to this type of construction being largely based on M. Considère's articles, published last year in "*Le Génie Civil*." Some additional notes, based on experiments by Mr. Dunn, are useful as supplementing the conclusions of Considère, but further investigation is required before the precise influence of this ingenious system of reinforcement

can be calculated with accuracy. The following section in the same part deals with "Longitudinal Direct Stresses in Pieces Subjected to Bending," the method of treatment adopted being practically that used by M. Christophe in his well-known work, "*Le Béton Armé*." It should be observed, however, that the formulæ here given differ from those of M. Christophe in the respect that the stress-strain curve is considered as parabolic by the author. The portion of the volume to which we now refer contains a very large number of equations for application to rectangular slabs and beams with single and double systems of reinforcement, and to T-shaped beams incorporating different systems of reinforcement. It also includes a series of most useful diagrams showing positions of the neutral axis, and unit bending moments for various percentages of metal in slabs and beams, as well as several tables calculated from the formulæ for purposes of comparison. Speaking generally, the conclusions expressed by the author are quite in accordance with those accepted as correct by authorities on reinforced concrete. He shows that double reinforcement is very uneconomical, and that the employment of large rolled sections is, for the same reason, not to be recommended. At the same time, we may remind the author that reinforcement in the compression area of a beam may sometimes prove economical in practice by permitting the application of concrete construction in places where it would otherwise be impossible, or where the adoption of intermediate supports would otherwise be necessary. At the end of the article relating to slabs, we find the following sentence:—"It will be seen that for a steel reinforcement the depth of the slab, for any given bending moment, will be greater than when a wrought iron reinforcement is employed, but the percentage of reinforcement is much less for steel than wrought iron." This pronouncement undoubtedly represents conclusions drawn from a diagram below which it is printed, but if read separately it would be misleading, and must not be taken as affording any true criterion to the relative merits of iron and steel. As a matter of fact, in general practice, the depth of a slab reinforced by steel of given volume or weight is less than the depth of a slab reinforced by an equal volume or weight of iron; and it would be quite easy, by using the author's formulæ in a different manner, to demonstrate the superiority of steel over wrought iron.

"Shearing Stresses in Pieces Subjected to Bending" is the heading of another article in Part VI. which ought to be studied with care, as the influence of shear on concrete has not invariably been accorded the consideration it undoubtedly deserves. Ordinary and special forms of longitudinal reinforcement, in fact, offer no resistance to shearing stresses in the concrete surrounding the metal. In the succeeding article of the same part, a summary is given of various methods of calculation for members subjected to bending, including references to those of Hennebique, De Lafarge, Bonna, Chaudy, Ritter, Considère, and Christophe. We miss here any mention

of several noteworthy theories pro-
pounded by various American authorities
on reinforced concrete, an omission which
scarcely does justice to the thorough
manner in which the study of the subject
has been taken up in the United States.
The author next sets forth the outlines
of "A Proposed Method of Reinforce-
ment and Calculation." The suggestions
here made are decidedly original and are
supported in principle by the results of
many of the tests already quoted in the
treatise. To quote the author's own
language:—"The best results should be
obtained if a hooping were provided
along the whole length of the piece, which
would prevent the swelling of the concrete
under compressive stresses, and some
form of reinforcement inserted on the
tensile side which would induce com-
pressive stresses in the concrete." For
details as to the manner in which Mr.
Marsh proposes to apply metal for the
purpose of attaining the ends here out-
lined, we must refer our readers to the
treatise. No attempt has yet been
made to test this method of reinforcement,
but we are quite inclined to think with
the author that it is a strictly rational
system, and that the resistance obtained
by its employment would considerably
exceed that afforded by any method
at present employed. The remaining
matter, under the heading of "Calcula-
tions," relates to rules for the design of
pipes, circular reservoirs, arches, and
other structures subjected to direct
stresses and bending moment combined,
and, finally, to a graphical method for
determining the stresses to be resisted
in domed structures, the treatment in
question being based upon a paper con-
tributed by Mr. Dunn to the "Transac-
tions of the Royal Institute of British
Architects," for March, 1904.

Part VII. is entirely descriptive, being
occupied with general particulars and
illustrations of structures erected in
reinforced concrete. Among these are
examples of houses, churches, ware-
houses, bridges, reservoirs, and many
other types of constructive work. This
portion of the work is most interesting,
and serves to show the wide adaptability
of the material.

An Appendix, in which the chief
feature is a fully detailed account of M.
Considère's test to destruction of the
Pont d'Ivry, is a fitting conclusion to a
volume, which, although it may lack
the authoritative character and originality
of a work by an investigator who has
made reinforced concrete the object of
experimental research, admirably attains
the aim of the author "to place before
engineers, architects, and others a com-
plete treatment of the subject of rein-
forced concrete in so far as is possible at
the present day."

EMPLOYMENT OF PLUMBERS.—In the Muni-
cipal Section of the Congress of the Sanitary
Institute at Glasgow, it was resolved:—"That
it is necessary to the effective administration
of the Public Health and Water Acts that the
relative authorities be recommended and
empowered to require that the competency of
plumbers employed to execute or inspect
plumbers' work under the regulations of these
authorities shall be certified by the Plumbers'
Company under the conditions appertaining
to the National Registration of Plumbers, or
by such other body as may be set up by
Statute, or be approved by the Local Govern-
ment Board."

NOTES.

Architects' Drawings. WE recommend our pro-
fessional readers, all of whom
are liable to become prac-
tically interested in the question in a
very serious manner, to read the very
clear and logical statement which
has been addressed, by the solicitors
for the defendant in the recently
tried case, to the individual members
of the Council of the Institute of Archi-
tects. There is no question that the
attitude which the Law Courts are
taking in regard to the application of
the precedent of *Ebdy v. McGowan*
constitutes a most grave attack upon
the architectural profession, and that
the general adoption of such a ruling
would be disastrous to them as well as
absolutely unfair and unreasonable. We
are speaking of course only on the
general principle; and on that account
purposely avoided, in our article last
week, making any direct reference to
the case which suggested the considera-
tion of the subject. But the matter is
exceedingly serious, and if the law is to
be interpreted as judges seem disposed
now to interpret it, we can only say
that the law *has got to be altered*. Our
own opinion, however, is that, owing
to a misconception as to the object of
architectural drawings and as to the
function of an architect, "*Ebdy v.*
McGowan" is being used to cover cases
to which it does not apply. Of the
failure, so far, of the Institute of Archi-
tects to take any steps towards defending
the profession we will say no more at
present, hoping that the Council, which
meets next week, may yet recognise
its duty to the profession of which it
is the central representative body.

Landlord and Tenant. THE case of *Woodall v.*
Clifton should be brought
to the notice of lessees of
real property, as it decides an important
and comparatively new point. In two
leases of land for ninety-nine years
an option was contained to purchase the
land or some part thereof at a named
price per acre, which might be executed
"at any time during the said term,"
and the two leases were in substantially
identical terms save that in one the option
was granted to the lessee, "his heirs and
assigns," whilst in the other it was reserved
to the lessee, "his executors, administrators
and assigns." These leases were granted
respectively in 1867 and 1869, and both
leases have become vested in the plaintiff.
The plaintiff exercised the option to
purchase the whole of the land comprised
in both leases, but was met by the con-
tention that the options were invalid
in law as offending against a principle
known as the rule against perpetuities;
that is, a rule which prevents any execu-
tory interest coming into force later
than "a life or lives in being and twenty-
one years after." Options contained
in leases to renew for a further term have
been held not to offend against the above
rule, and it was contended that the above
options were valid on the same grounds;
but the learned judge held that the options
in both leases were invalid since the
options in those conveyances created
an interest in the land which did not
vest in the lessee at the time when the

leases were granted—as is the case
an option to renew—but deferred to
interest to the exercise of the option
which might be exercised at a time
outside the limit prescribed by the rule.
Such an option as that above granted
would seem one so natural and desirable
to any layman that too much public
cannot be given to the decision, and lessees
must be careful to see that an option
to purchase the premises is not deferred
more than twenty-one years from the
granting of their lease, unless a life
lives of living persons are also inserted
in the clause giving the option.

The Isle of Wight Coast. IN a "Note" which
appeared in our issue
November 5 we mentioned
that the Isle of Wight Rural District
Council had decided to consider a Report
from the county surveyor relative to
the protection of the coast at Freshwater
gate. It is satisfactory to learn that the
Council have done more than this, for
a meeting held last week they were
to consider a Report furnished at the
request by a local geologist. This Report
emphasises the extraordinary fact that
great quantities of shingle are being
moved by Government from Whitecliff
Bay, between Sandown and Bembridge,
for the purpose of making concrete
to be used in the construction of a
fort. In consequence of this unju-
stifiable action the bay has been
denuded, and at high water the sea
reaches the base of the cliffs, a result
which has not happened for at least a quan-
ty of a century. We pointed out in our
column with the papers on "Coastal
Erosion," read before the Institution
of Civil Engineers, that the Government
"claims absolute authority over the
foreshores and does nothing for their
protection." From the facts now stated
it is clear that the Government do some-
thing less than nothing, for at the
Isle of Wight they are taking active mea-
sures for the destruction of the coast. This
is really scandalous, and we have every
sympathy with the decision of the
Isle of Wight Rural District Council to imp
upon the War Office and the Board of
Trade the necessity for immediate or
stopping the further removal of the
material. At the same time we should
like to know what the Council pro-
pose doing for the protection of Freshwater
gate. Their present inaction must not
be allowed to continue.

The Philæ Temples. *À propos* of the further
mention of the Island
Philæ, Mr. Somers Clarke
pays a well-merited tribute to the
anxiety displayed by the Egyptian
Government to protect the buildings as
far as possible. Admitting that there is
reason for believing that the stonew
of the walls and columns will not crum
away under the influence of the water
he fears the architraves and horizon
roof slabs may be prejudicially affec
by soaking for weeks at a time. From
past experience we feel satisfied that
the authorities will show themselves re-
solute to carry into effect any recommen-
dations that may be put forward by
Maspero, the Director-General of Ant
iquities, for the preservation of the
Judging from the results afforded du

the past two years, the masonry already subject to immersion has suffered no ill, although its exterior has been washed to a cold grey tint, and the colour of painted surfaces is rapidly fading. If the same care be given to the upper portions that will be immersed when the Assuan Dam has been raised, the permanency of all the buildings should be adequately assured.

The Disfigurement of Clifton. We are pleased to learn that owing to the jettiness of the jetty, which we mentioned in a recent "Note" as a useful weapon of opposition, Sir John Aird has definitely abandoned his intention of using the Leigh Woods quarries for the supply of stone to the Avonmouth dock extension works. This decision removes a great immediate danger, but does not in any way safeguard the future, as three quarries are still being worked, one of them by the Bristol Corporation, who ought to know better. The perfectly feasible suggestion has been made that operations could be conducted on the behind-bank system, the adoption of which would not affect the quantity of stone quarried, nor the number of men employed. Still, if the stone were delivered from the front of the quarries the Avon gorge would continue to present indications of work, which are quite out of keeping in a place of sylvan beauty. It may be that stone can be obtained in this spot a little cheaper than from other sources; the same may be said of shingle filched from the seashore, but in neither case is it right to cause irrevocable injury to national property for the sake of saving a few pence per ton of material.

Impact Tests on Steel. In the paper read before the Institute of Mechanical Engineers by Mr. A. E. Eaton and Mr. A. Jude, the authors stated that considerable movement had been made of late towards the establishment of a shock test for steel, and afterwards expressed the opinion that progress in this direction was taking place still so slowly. The latter is a view with which we fully agree, especially as nearly two years ago we said: "Impact tests have not received the amount of attention which their importance deserves. . . and some of the results obtained merely seem to indicate that the measurement of shock resistance is likely to furnish a new factor in judging the liability of iron and steel." The objects of the paper to which we now refer are to show some of the characteristics and peculiarities of commercial wrought steel, assist in the development of a more rational method of testing the suitability of such steels for particular purposes, and to point out a few of the peculiarities observed in the fracture of test specimens and actual parts of machinery. For steel used on structural work, subjected to steady loads only or to current loads at intervals, the ordinary tension test is doubtless quite adequate. In the other hand, for steel used in structures subjected to rapidly repeated loads more or less suddenly applied, to alternating loads, the tension test is insufficient. From the numerous bars

tested by the authors they conclude (1) that the number of blows to produce fracture is a fair gauge of the toughness or anti-brittleness of the steel, and (2) that there is no relation whatever between this result and the tensile test results, except that if the impact test result is good the elongation is sure to be good; but that a steel showing high tensile strength and good elongation may be useless to resist shock.

Electric Railways. THE report of the joint meetings of the Institutions of Electrical Engineers of Great Britain and America at the Exhibition at St. Louis last September, which has just been published in the "Journal" of the American Institution, is exceedingly instructive. The most important discussion was that on the methods and systems of using alternating current in electric railway motors. The report of the speeches makes it perfectly clear that the American engineers have completely mastered the problems of electric traction. Mr. Steinmetz, in a clearly reasoned speech, points out the different nature of the problems that have to be considered in electric traction in tramway systems in towms, in inter-urban railways, and in long-distance railways. For tramways in towms direct current at from 550 to 600 volts pressure is the most suitable, but for long-distance work the alternating current motor has found and developed a field of its own. Mr. Steinmetz, who is the author of the standard work on "Polyphase Currents," apparently has not a high opinion of the polyphase motor. The only use he finds for it is in connection with mountain railways, where the character of the work to be done is similar to that done by the motors used for lifts. The advantage that single-phase systems have over polyphase systems is that only one trolley wire is required. Another is that the motors used have a very large starting "torque," and so there is little likelihood of a train coming to rest on a steep incline at a considerable distance from the power station, and not being able to start owing to the considerable loss of pressure due to the large currents having travelled considerable distances. Mr. Sprague mentioned that the railway companies were adopting electric traction on their branch lines, because they found that this was the only way to make them profitable. Mr. Elihu Thomson pointed out that the new alternating current motor would work equally well either with direct or with alternating current, and that railways were now being built which worked primarily with alternating current, but that in the neighbourhood of towms they would be worked by direct current, the electrical apparatus on the motor-cars acting equally well in the two cases.

Fires in Country Houses. THE past ten days have seen several fires in important country houses, resulting not only in the destruction of property but of works of art such as are often found in English mansions, and which it is impossible to replace. It is obvious that much greater care is required not only in the inspection of flues and other fire traps from time to time,

but in that nightly guard which discovers a fire at an early period. It is indeed surprising that rich men who are owners of great houses do not have much more efficient watchiug, considering how small is the outlay for this purpose in comparison to the risk which is incurred by the absence of any such care. In some places means of communication with fire-stations, as by telephone, does not exist, and the water supply is singularly bad, the want of any means of escape too is also often remarkable. Whether warnings are of any value we do not know, but they must be given.

A Historical Atlas of London. MESSRS. GEO. FALKNER & SONS are about to produce reprints, in slightly reduced facsimile, of eight entire maps with some sheets of selected sections to illustrate the gradual growth of the town during the XVIIth and XVIIIth centuries. The descriptive notes will be written by Mr. Randall Davies, F.S.A. Seven of the maps will be reproduced from original specimens in the Grace collection, the facsimile of Faithorne's from the copy lately secured for the British Museum. The set ranges from Ryther's map of 1604 (engraved and sold at Amsterdam by Cornelis Dankerts) to that published in 1776 by Laurie & Whittle, of Fleet-street. It includes one of the two or three engraved by Hollar in 1666-7 showing the extent of the Great Fire, and Wren's plan for rebuilding the City. The former, we gather, is the unique specimen of which the original measures 33 in. by 21½ in., which, it seems, was "reduced into one entire plat" by John Leake, one of six who in 1666 had "first described in six plats," by order of the Corporation, "an exact surveigh of the streets, lanes, and churches contained within the ruines of the City of London." Vertue made a copy of it, to a larger scale, with amplifications. We may mention that of the map engraved by William Faithorne on seven sheets for Newcourt, the only other original impression of which the existence is known is preserved in the Bibliothèque Nationale, at Paris. It is a beautiful work, delineating, to a scale of 1 in. to 150 yds., the buildings, etc., *à vol d'oiseau*. Though dated "1658" it bears internal evidence that the survey was made in the interval 1643-7, for it depicts Charing Cross, which was pulled down in June—August, 1647, *teste* Lilly, and does not show the other Eleaour Cross, in Cheapside, which was pulled down on May 2, 1643, as Evelyn records. The impression in our national collection is, we imagine, that of which the discovery was announced in 1855. A copy of it, engraved by George Jarman, was published by A. E. Evans & Sons, of No. 403, Strand, on May 1, 1857. The limits of the survey are Clerkeuwell, Southwark and Lambeth, Shoreditch, Whitechapel, Limehouse and Wapping, and Holborn, St. Giles, Piccadilly Hall, Berkshire (Bridgewater) House, St. James's, and Tothill-fields; an inhabited area of between twelve and thirteen square miles.

ENVILLE HALL, near Stourbridge, the seat in Staffordshire of the Countess of Stamford and Warrington, was almost

* The Builder, Vol. lxxviii, p. 119.

entirely destroyed in the morning of Friday, November 25, but most of the contents of the strong-room and the ground-floor apartments, with some pictures by Titian, Murillo, Rubens, and Romney, were removed in safety. At Enville Hall, of which the older portion was built in the middle of the XVIIIth century, were preserved some relics of Lady Jane Grey. John Grey, of Enville Hall, ancestor of the Earls of Stamford and Warrington, was a lineal descendant of Lord John Grey, of Pirgo, co. Essex, nephew of Lady Jane Grey's father, the Duke of Suffolk. The ornamental grounds at Enville were laid out by Shenstone, and contain a small chapel erected to his memory. The south aisle of the parish church, which Sir G. G. Scott restored in 1872-5, contains some monuments of the Greys, and is known by their name.

School of Art Wood-Carving. An exhibition of students' work was held in the Wood-carving School-rooms, Exhibition-road, South Kensington, this week. The work shown included studies under the direction of Mr. H. H. Grimwood and Mr. George Jack, and specimens of the course of studies given to students preparing for the Certificate Examination of the school. Instruction in design in practical relation to wood-carving is now given by Mr. Jack, whose excellent influence is already making itself felt in the work that is shown. We recently noticed Mr. Jack's book on this subject, and pointed out how enlightened were his views and what delightful results they achieved in practice. There is probably no other exponent of the art of wood-carving at the present day than Mr. Jack. Last week we were able to give illustrations of some work done by students of the Royal College of Art under his tuition; students, of course, not entirely devoted to wood-carving, as in the case of students at the School of Art Wood-carving. Photographs were on view at the exhibition showing some nice work, including a pulpit carved by Miss E. R. Plowden. Working drawings were also shown of designs in course of execution. Not the least interesting rooms were those in which the students were hard at work carving.

The Goupil Gallery. THE exhibition at the Goupil Gallery of Paintings and Drawings by Mr. G. Clausen is somewhat disappointing. There is the fine picture "Willow Trees at Sunset," which has already been seen at the Academy; most of the others are rather slight studies for pictures. Among these "October Moonlight" and "At the Back of the Farm" are very interesting suggestions in composition and lighting; "Early Spring" is another admirable study. "Mowing the Orchard," a larger work, is spoiled by the careless or indifferent painting of the figure in the foreground. The study of an old man, under the title "Old Joe," is admirable for breadth of style and effective colour. Mr. Clausen seems also to be taking up flower-painting rather in the style of Fantin-Latour; at least, his works remind one of that artist. The best of them is "Carnations by a Window," a very complete and satisfying painting of its class.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary fortnightly meeting of the Architectural Association was held on Friday last week at the new premises, 18, Tuffon-street, Westminster, the President, Mr. Guy Dawber, in the chair.

Mr. H. Tanner, jun., Hon. Secretary, read the minutes of the last meeting, which were confirmed, and the following gentlemen were then elected members:—Mr. F. G. Booker, London; Mr. H. C. Tryon, Epsom; R. A. F. Guimaraens, Ealing; A. St. H. Brock, North Cheam; F. W. Langman, London; F. V. Longstaff, Wimbledon; and W. B. Medlicott, London.

The Building Fund.

The President announced the following further donations to the Building Fund, *i.e.*, Messrs. John Murray, 105*l.*; H. L. Florence, 50*l.*; T. Elsley, 2*l.*; A. N. Prentice, 10*l.* 10*s.*; C. Hodgson Fowler, 5*l.* 5*s.*; Theo Moore, 5*l.* 5*s.*; H. S. Moblett, 5*l.* 5*s.*; P. E. Pilditch, 5*l.* 5*s.*; W. Woodward, 5*l.* 5*s.*; Sir A. Blomfield & Sons, 3*l.* 3*s.*; W. H. Sorymgour, 3*l.* 3*s.*; G. Watson, 3*l.* 3*s.*; A. C. Galbraith, 2*l.* 2*s.*; P. W. Lovell, 2*l.* 2*s.*; W. L. Lucas, 2*l.* 2*s.*; A. Bolton, 1*l.* 1*s.* 6*d.*; F. H. Crawley-Boevey, 1*l.* 1*s.*; J. S. Gibson, 1*l.* 1*s.*; C. R. G. Harding, 1*l.* 1*s.*; and T. S. Inglis, 1*l.* 1*s.*

He also announced that the following members had kindly promised to double their annual subscriptions until the building debt was closed:—Messrs. S. Chatfield Clarke, W. E. Davis, E. Guy Dawber, Henry T. Hare, Arnold Mitchell, E. H. Sin, B. N. Southall, A. H. Ryan Tenison, M. E. Webb, Louis Ambler, A. Bolton, W. G. R. Bousfield, C. H. Brodie, F. Dare Clapham, A. O. Collard, G. Hubbard, J. K. Hunter, H. P. G. Manle, L. Simmons, and A. D. Smith.

The Late Mr. J. Norton.

The President said that since their last meeting they had lost an old member in Mr. John Norton. Mr. Norton had been a member of the Association for a great number of years, and in 1858 he was their President. He had been a good friend to the Association ever since. The Association was represented at the funeral by the Secretary, Mr. Driver, and he had now to propose that a vote of condolence be passed to the relatives of Mr. Norton.

The vote was carried in silence.

Mr. Tanner stated that, by the permission of Mr. F. T. Verity, a visit to the new theatre, Charlotte-street, Tottenham Court-road, would take place on December 3, the members to meet at the building at 2 p.m.

Mr. L. Ambler, Hon. Secretary, proposed a vote of thanks to Mr. E. Guy Dawber for the gift of an arm-chair to the reading-room, and this was agreed to.

Mr. J. F. Micklethwaite then delivered a lecture on

The Church of Westminster Abbey.

Mr. Micklethwaite said the subject he had chosen had been vaguely announced as that of Westminster Abbey, but what he wanted to talk about was the church of Westminster Abbey only, and how it came to take the form it was now. One of the rarest things in England was an old church which had been built straight out of the ground, uninfluenced by what was there before. Amongst the parish churches he did not think there were more than half-a-dozen which they could say were built on new sites and not influenced by what was there before. Amongst monastic churches perhaps there were some, but even there, if they looked closely into the case, they found nearly all of them influenced by earlier buildings which had sometimes been only temporary. Westminster Abbey was perhaps one of the most uniform churches of its kind to be found anywhere, for they found the same design running through it from beginning to end, and he had often seen it quoted as a complete example of a XIIIth century church, although it was admitted that the later parts were not XIIIth century. The same design, however, was carried through. He wanted to show them that the design as they had it now was really influenced by what had been before. He wanted to show how one step led to another until it grew from a church totally different to what it was now. The story of Westminster Abbey began in a fog—they knew nothing about it but what was legendary. They all knew that St. Peter came down on the wrong side of the river to consecrate it, and had to be paddled over, but why it was he missed his way they did not know. However, when they came to

genuine history they had nothing very new before the refoundation by Edward the Confessor except the fact that there was an older Westminster Abbey in existence. Edward the Confessor undertook to make what, for time, was an unusually large foundation its place. They had an almost contemporary description of what Edward did, and it told pretty well what the design must have been; but that was to some extent influenced by the Saxon work there before. They told it was built to the east of the old church, which was afterwards joined on to it with intervening vestibule, and it was his intent speaking as he was to architectural study to work the thing out by sections, and on the plan. Mr. Micklethwaite proceeded to illustrate his remarks by means of drawings arranged one on top of another. Starting with a blank sheet—which he described as fog—he had previously referred to—he showed first one part and then another part of Abbey was built and re-built, and altered until it reached its present state. In the beginning they knew that there was a church probably 200 or 300 years old, before the time of Edward the Confessor. They knew it stood, and could guess more or less what it was like. Edward the Confessor started to build his church in what was a new fashion. People commonly spoke of a style called the Anglo-Saxon, and a style called the Norman. It used to be said that when William came he brought over the Norman style in pocket, but the fact was that the so-called Norman style grew out of the so-called Anglo-Saxon. The church at Westminster was spoken of by Englishmen at the time it was being a new style, and they had in the "Life of Edward the Confessor" a description of it written by a man who had great admiration for the church, but did not know how to describe it. The writer told them that Edward I. built a church with a tower and transept, and it was round at the end, and that the church was in the middle, and that it was consecrated a few days before Edward died. The use of the future participle in the description proved that the chapels were not finished until several years after the church was consecrated. The case of the King's building westwards was very clear, for all they had remaining were a bases now under the floor of the Sanctuary. The style was quite Norman, and the moulding occurred at Peterborough and Blyth and other churches which they knew were of Norman. Proceeding to show a section of the church as Edward left it, Mr. Micklethwaite said it was very like what was found at Peterborough and Blyth. St. Albans was a little different as it was built in brick and finished in plaster, whereas the church at Westminster was stone. They had also a few fragments apart from the bases he had mentioned which proved that the church was more or less like the drawing they saw before them. There was a uniformity about the churches of that time both in England and Normandy, because they were practically the same at the time, for quite apart from the Conquest they were going on *pari passu* on both sides of the Channel. When the building was finished they joined it up by the vestibule he had mentioned, and they had the tall church and the little old Saxon church forming a nave. They must remember that in the old days in the monastic and secular collegiate churches the nave and choir were not as the nave and chancel of the modern parish church. They were practically separate buildings as far as use was concerned. The church was not considered complete as Edward left it, but his foundation well endowed. After his death they went on building, but they built slowly and it was the end of the XIIIth century before the nave was finished. They knew the church was completed, because they had written description of it in the XIIIth century before the next step was taken. An addition was made before anything was pulled down, which was the erection of a lady chapel at the east end in 1225. It was commonly said this was done by Henry III., but it was not so. Henry III. was a boy at the time, and there was evidence that the church was built by subscription in the usual way. They had the foundations of a good part of this remaining under Henry VIII.'s chapel. Twenty years later Henry III. became a benefactor, and undertook to rebuild the church of the church to give greater glory to the shrine of the Confessor, and this shrine also made at great cost. He began by pulling d

the Confessor's choir up to and including the crossing, and building what we now see in its place. Henry III. made two stores of his building to the height of the three stories of the original church. About 1260 it appeared that the first work was nearly finished and Henry undertook the completion of the whole choir. Some of the books told them that Edward I. did this, but there was no evidence of it. On the other hand, there was evidence in the coats of arms in the aisles that it was done in Henry III.'s time. There were the coats of arms of different persons which would not have appeared in Edward I.'s time, which proved that Henry built the choir proper. The design was the same, but with considerable variations of detail, which he could only show them if they were on the spot. They could trace distinctly where one work ended and another began. They knew it was finished in 1269, because on the Feast of the Translation of St. Edward, which was October 13, the monks entered the new choir. That was the state of things on the death of Henry III. in 1272. It left the church in the condition of having a lofty choir and a comparatively low nave, with a thick wall dividing the two, and some sort of lean-to roof at the junction. Fifty years or more afterwards they began to alter the west end, and somewhat later they came in for a large sum of money and rebuilt practically the whole of the domestic part of the abbey, and also set to work to rebuild the nave. A large part of the work was done during the XIVth century, but with the French wars and other things money was lacking, and the work then went on slowly to the end of the next century, when they filled up the gap between the XIVth century nave and the work of Henry III., and that work was here now to tell its tale. It was quite at the end of the XVth century that they closed the gap and put in a new west window. What he wished to impress on them was how much the form had been arrived at by what was there before. How first there was the Saxon Church and the Norman completion of it; then the XIIIth century work put in between the lady chapel and the still existing Norman nave; and then the Norman nave replaced by what was there now. That brought the church practically to its second completion, as he might call it. There was one other alteration. The XIIIth century lady chapel was pulled down and replaced by the splendid Henry VIII.'s chapel. Thus they saw the church grow up from a little church, bit by bit, until they got the present building.

Excavations in Ancient Westminster.

In the absence of the author through illness, Mr. L. Ambler then read the following paper for Mr. E. P. Warren, entitled:—"The Abbey Mill Stream and Bridge at the corner of Tufton-street and Great College-street, Westminster":—"Great College-street forms the southern boundary to the garden of Westminster Abbey, from which the street is separated by the well-known mediæval stone wall that runs along its northern side.

In many old maps this is called the Dead Wall, and separated the garden from the path and water-course, the situation of which are accurately represented by the street of to-day. In a map dated 1690, at the British Museum, this Dead Wall is shown as forming the southern enclosure of the Earl of Lindsey's garden, the eastern portion of which seems to have formed part of the site of the Abingdon-street houses.

Many confident statements are to be met with that the water-course in question was a tidal creek, practicable for boats and barges as far as the ancient Abbey Gateway, represented by the archway at present giving access to the south-eastern corner of Dean's-yard, anciently called "The Elms." A study of XVIth and XVIIth century maps and plans, however, makes it clear that this water-course was a mill stream of no great width, and serving a mill placed on the river bank at the southern end of the present Victoria Tower Garden.

This mill is clearly shown in several plans and "Birdseye" views, notably in the plan of Pieter Vanden Keere, 1593, in the print-room of the British Museum. In this plan a double structure is shown, labelled the Queen's Slaughter House and Mill.

Norden's map, in the "Speculum Britannicæ," published in 1593, also clearly shows the Mill and Queen's Slaughter House.

The Slaughter House existed well into the XVIIth century, and is shown as the King's Slaughter House, in the same position, in a plan

of intended improvements to Westminster Bridge, dated 1739, at the British Museum.

In view of its position on a tidal river, with so great a rise and fall of tide as the Thames, the Mill, in all probability, must have been worked between tides, and very likely by means of automatic flood gates, which admitted water as the tide rose, and held it back as the tide fell. There are, I believe, many mills of this sort existing on Southampton Water and elsewhere, and I have lately seen one near Chichester. If such was the nature of the mill, boats or barges could only have passed from the Thames to the mill stream at high tide by some side creek or lock, which I have been unable to detect on any of the maps or plans I have seen; and in the recent demolitions of buildings in Great College-street, and the subsequent excavations, nothing, so far as I am aware, has been discovered, either in the nature of quays or wharves, or in that of fragments of boats or apparatus of any sort, to warrant the supposition that the stream was navigable.

It is possible that the other branch of the Tyburne, which ran along the northern side of Thorney Island, and fell into the Thames further down, was navigable to some point in or near the enciente of the Abbey precincts, but of this I have no evidence.

In Richard Bloom's "Map of the Parish of St. Margaret's, Westminster, taken from the last Survey with Corrections" (1720), the position of the eastward commencement of uncovered waterway in Great College-street coincides with the bridge recently uncovered at the junction of that street with Tufton-street, and of which I am able to show a photographic view, and a measured drawing made last spring.

Bloom's map shows Tufton-street as the Bowling-alley, a name under which it figures in several contemporary and earlier maps, and indicates several small bridges crossing the course of the stream in what is now Great College-street and connecting the path that ran along the bank under the old wall, known as the Dead Wall. It further shows one wide bridge for general traffic on mill bank.

The bridge, as shown in my illustrations, consists at present of a round brick arch or vault, placed between two stone abutments or flanking walls of obviously earlier date. The brickwork appears to be, at earliest, of XVIIIth century character, and the arch uncovered recently, seems to me to be the end of a culvert rather than a bridge, and formed between the stone abutments of a demolished bridge, which was probably of timber, merely to enable the street to be carried solidly up to the entrance of Dean's-yard.

It is noticeable that the exposed end of this brick vault shows that there is no invert arch. The vault indeed springs from the clay of the bed, without anything approaching to foundations. As I saw it in the spring, the right hand or northern side of the vault rested upon a thin slab of wood, which, on inspection, proved to be not even oak or elm, but pine.

I have had no possible means of ascertaining the length of this brick vault or culvert, and its extent would throw considerable light upon its purpose, for, if extending back, *i.e.*, westwards as far as Great Smith-street, it would lead to the supposition that, after the disuse of the mill and mill stream, the latter was vaulted over to gain ground whereon to erect buildings or form gardens at the back or to the southward of Dean's-yard.

A few years ago the northern side of Little Smith-street, at present occupied by the Church House, was formed by a row of small houses, whose back-yards abutted on the mews and back-yards of Dean's-yard, under these back-yards approximately the stream must have passed. But Norden's map shows a twin stream, the southern branch of which would, I think, about coincide with Little Smith-street. These streams seem to converge at the bridge.

It will be noticed in Norden's map, of which my illustration shows a portion, that there is a group of buildings precisely at the point where the recent excavations have discovered so many indications of XVIIth century usage.

These are the only buildings which, in 1593, seem to have existed on the south bank between the Abbey gate and the river.

The stone abutments or flanking walls of the bridge are in fairly dressed masonry of Kentish rag, and are, I should say, not later than the early part of the XVth century.

Eastward of the bridge and marking the southern bank of the stream, is a row of small timber piles or camp shedding, probably placed to form a stable site on the bank for building purposes.

Upon this site, extending between Tufton-street (the old Bowling-alley) and Barton-street, a much more recent thoroughfare apparently, there stood until last year two blocks of houses separated by a narrow passage called Black Dog-alley, and all, I think, of the XVIIth century; though the brick-vaulted cellars beneath those in the eastern block next Barton-street, built of smallish bricks, had the appearance of XVIIth century work.

A very large number of objects, pottery, spoons, knives, etc., mostly of the XVIIth century, were found in the recent excavations beneath these houses, together with a portion of a Purbeck marble shaft, which I believe to be the upper part of the shaft from the north-eastern angle of the Confessor's shrine; it exactly fits that position. I shall now be able to show other objects of a similar character, but before doing so wish to offer a few remarks upon the course of the stream in the neighbourhood of Thorney Island, and must profess my indebtedness for much information to Mr. J. G. Waller, Fellow of the Society of Antiquaries, whose paper and plan contained in the transactions of the London and Middlesex Archaeological Society in 1890 is of extreme interest and value.

Mr. Waller derives its name of Tyburne from the Saxon Tye or Teo Bourne—a double brook—and accounts for this name by the duplication or bifurcation which forms the delta on which the city and abbey of Westminster stand, and which, as he says, it must have done much to form. He points out that in its southward course, from its rise in the Conduit fields below the hill of Hampstead, to the Thames, it gives name to Brook-street, to Conduit-street, and to Pump House-ground, at the junction of the latter with Bond-street. Hence it passed by the rear of the gardens of Berkeley House and the end of Clarges-street to the Green Park, which it crossed to the front of Buckingham Palace, where, in Faithorne's map of 1685, it was covered in from view. Passing in front of the Palace its course was down James-street, Chapel-street, Orchard-street, between the present Church House and the south side of Dean's yard to the bridge at the corner of Tufton-street.

Mr. Waller describes the junction of the other branch, the bifurcation, as occurring in front of Buckingham Palace, whence, he says, it made a bold sweep westwards forming the ancient boundary of Westminster, and, under the name of the King's Scholar's Pond Sewer, passed into the Thames, running close to Victoria station; there was in the early part of the XIXth century a brewery here—and by Vauxhall Bridge-road and Tachbrook-street, out to the river. But there is still the eastern branch which confined the island of Thorney to account for, and this is more difficult. In Norden's map a branch is shown running eastward along St. James' Park until close to Spring-gardens, somewhere about the present Admiralty buildings, it seems to be covered in, or at any rate disappears. The whole lie of the ground, however, and the lines of the houses in old maps, seem to indicate that it passed through Old Scotland-yard or thereabouts, and made for the Old Scotland Dock, shown clearly in the plan of the Palace of Westminster, published by the Society of Antiquaries in 1747, from a Survey of 1680. There seems, however, to have been an offshoot of this branch running southward across the present Parade Ground of the Horse Guards. I think it must have passed along a portion of the eastern side of St. James' Park, as excavations along the western side of Delahay-street some years ago discovered a number of willow trunks, etc., and down Princes-street, which in a map of 1685, as well as in others, is called "Long Ditch," though this, of course, may have been an artificial ditch.

The water has long since, been diverted from the natural course of the stream into the pond in St. James's Park, and into various sewers. There is no water in the old course in Great College-street, and my examination of such portions of the course as were recently exposed suggested that the diversion of the water, and the silting up of the course, had rendered the stream inoperative as a mill-race before the brick culvert or bridge was built.

I have now to draw attention to the objects found in the excavations on a spot bounded by Tufnell-street—or the old Bowling-ally—on the west, the Mill Stream or Great College-street on the north, and Barton-street on the east, and extending to some 80 or 90 ft. southward from Great College-street.

Most of the articles were found within 20 or 30 ft. of the old stream; many in the course itself. These mostly, to such an audience as this, speak for themselves.

They consist chiefly of spoons, knives, and pottery. Of the spoons, No. 1, a small slip-ended pewter spoon, is, I think, the earliest, probably early XVth century, and much like one in the Ellis Collection at South Kensington, having the date 1523 assigned in it.

No. 2, marked "S. G." on the handle, and No. 3, with "H" on the back, are of about the middle of the XVIIth century.

No. 4, a pewter spoon with a touch composed of two cross spoons, is of the first half of the XVIIth century.

No. 5, a brass spoon, 1660.

No. 6, a brass spoon with a heart on the touch and a *piéd de biche* handle, probably 1680-90.

No. 7, a spoon marked "T. S." and with a *piéd de biche* handle, of about the same date, as also No. 8, a pewter spoon with a lozenge-shaped touch.

No. 9, the sifting or straining spoon of brass, from the shape of its handle must be, I think, of the XVIIth century; probably late.

The knives are, I think, all of the XVIIth century, with the possible exception of No. 10, a knife with a small, blue-stained, short wooden handle, inserted in an iron ferrule, which may be of the late XVIth century.

The small glass hottles, Nos. 13 and 14 are probably scent or essence bottles.

I am indebted to Mr. W. W. Watts, F.S.A., and Mr. Mitchell, of South Kensington Museum, for kind assistance as to dates and descriptions of these articles.

The most interesting find has been No. 19, the "Gray heard" jug with its contents. When found and purchased by me it was stoppered down with a cork, and upon opening it and washing out the contents, was found then to be the objects here exhibited, viz. :—

A small piece of cloth or serge, formerly red, cut carefully, and neatly into a heart shape, and stuck full of brass roundheaded pins, each pin bent. A small quantity of hair, ostensibly human, and some small finger nail parings. I think there can be little doubt as to the nature of this deposit inside a corked jug, found in the clay of the mill stream bank. It is a malevolent charm, the intended victim of which was a woman, and it is perhaps permissible to surmise that the depositor and evilwisher was of the same sex. Perhaps a maidservant who had a grudge against her mistress, and who could easily obtain the clippings and prunings of her toilet.

The jug and its contents were probably buried, with the accompanying rite of a fearful incantation. The Lord's Prayer may even have been said backwards, and a peculiarly malevolent phase of the moon may have been awaited. If it is fair to form these somewhat uncharitable and ungallant surmises, the opportunity is also presented of adjusting the balance of charity, and of gallantry by expressing the sincere hope that the charm was ineffectual, that the fair intended victim escaped all aches and pains, and that the only pricks bestowed were upon the repentant conscience of the depositor.

Having but little knowledge of the Black Art, and being unable to count a single sorcerer amongst my acquaintances, I appeal to any of my audience who are more crude or more highly favoured to assist me with information as to the science and practice of charms of this order, or to cite similar or correlative instances of which they may have knowledge.

At the conclusion of the paper Mr. Ambler read from *Notes and Queries* an interesting article on folklore, bearing principally on the discovery of the box referred to by Mr. Warren containing a heart pierced with pins.

The Dean of Westminster said the associations of Westminster were always full of interest. He did not know that it was wise that such an immense amount of important information of a dangerous character should have been conveyed to a general meeting, but happily in these humane days they only used pin pricks in a controversial way. He really rose to thank Mr. Warren and those two of his pupils who

were good enough to bring back to the shrine of Edward the portion which had been carried away at the time of the Reformation, and which had found a lodgment in the mud somewhere near the little culvert of which they had seen a view. A portion of the shrine of St. Edward was something which was beyond all price, and it was highly honourable—scarcely that, for it would have been too terribly dishonourable if any person had kept this portion of the shrine back. At the same time they did most earnestly and sincerely thank those who secured it for them at a time when it might have slipped away. It might have slipped away into the American market, where it certainly could have been sold for a large sum of money. They were glad to get a fragment of that kind back again, and they owed a debt of gratitude to those who had restored it, and it was a desire to publicly acknowledge this which brought him there that evening. Mr. Micklethwaite's wonderful scheme he had had the privilege of seeing before, and it was always worth spending an hour just to see his "onion peeled," as he called it, again.

Mr. W. D. Caröe, in seconding the vote of thanks, said it was impossible to speak for the first time in that room without congratulating the Architectural Association on the acquisition of those admirable premises beneath the shadow of Westminster Abbey. They had been told in these latter days that architecture and archaeology were to be divorced, but it was satisfactory to hear amongst the earliest papers in their new abode such archaeological and, in part, mystical papers. He was afraid it was a good many years ago when he had the privilege and fortune of having the run of Westminster Abbey, and he believed there were none of its secret places or of its eloquent stones with which he had not at one time a pretty familiar nodding acquaintance. He referred to that because it taught him that if there was one person who knew far more about Westminster Abbey than he did that was Mr. Micklethwaite. He trusted that one of the influences of their new home would be to encourage the younger members more than was the case amid the solemnity of the walls of Conduit-street to take part in the discussions.

He thought he could assure Mr. Warren that the old writers were correct when they stated that the millstream was navigable, and he had taken from its bed from beneath the foundations of new buildings at Westminster a very unmistakable article, viz., the end of a barge pole. A still more significant article found was a boat-hook taken out at nearly the same position. It was possible that these might have been thrown in, but it was fair to assume that they were lost in use at the bottom of the river. Mr. Warren referred to the fact that there was a bowling green in Tufnell-street, and he (the speaker) produced two howls which had been dug up. All these articles were found beneath the foundations of Great College-street-buildings, which were removed. He also found an exact counterpart of one of the Grey-beard jugs, which was incomplete, and another which was considerably larger, and had a German inscription several times repeated. There was another article found in a deep foundation, but which no doubt came out of the ash pit. It was a coronation cup of King William IV., and as it was found a day before the coronation of King Edward VII. it was a curious coincidence. One effect of Mr. Micklethwaite's remarks ought to be to convince them that Westminster Abbey was one of the most interesting and best preserved buildings in Christendom. They could wander all over the Continent, and wherever they went they could not find a single building with so many curious points of interest. The extraordinary regularity with which the apse was set out, almost to within an eighth of an inch, and the introduction into it of the XIIIth century Italian work were all curious things one did not often see in other churches—certainly not in this country. Mr. Micklethwaite had referred to the question of the tower of the Abbey, and doubted whether it was ever built. He hoped in the course of another month or so to be able to make public a statement on the ancient Norman central tower at Canterbury, called the Angel steeple. The chief point of interest he would be able to establish was that the new arches were put in underneath the Norman tower which was entirely preserved. Whether the same thing took place at Westminster he could not say. It certainly was a very curious circumstance showing the immense skill in pure engineering works that

the builders of that time possessed. Of course they knew many examples where they succeeded in putting arcades under Norman walls, but was not aware of any other example where the entire tower was kept up and where the Norman piers were cased round and the Norman arches taken out and new arches put in underneath it.

A Visitor remarked that he had watched with sorrow new buildings going up in Westminster which to his mind were appalling eyesores—a disgrace to the City not only on account of their own intrinsic hideousness, but also account of the absolute incongruity with the ancient and beautiful surroundings—surroundings which were dear to those of them who were citizens of Westminster. He thought that the Association might possibly approach the authorities to prevent similar atrocities being perpetrated in the future. He would urge that Westminster City Council and the London County Council should be moved to appoint a permanent committee of architects which should have power to prevent the erection of any buildings which were inartistic and architectural bad and more especially incongruous with the existing surroundings. There would be difficulty in finding members for such a committee with the Association in their midst.

Mr. Francis Hooper said he would like to ask a question with regard to the earliest building on the site of Westminster Abbey. Mr. Micklethwaite had dealt with the outlines and situation of the Saxon church, but it was generally believed that this church occupied the site of a Roman temple dedicated to Apollo. Was that a fact, and were there any indications at all—any remains as evidence of the fact?

The Chairman, in putting the vote of thanks to the meeting, said the dissertation which Mr. Micklethwaite had given them had been one of the most interesting he had ever heard. There was only one fault about it—it was too short, and perhaps Mr. Micklethwaite would give some particulars when he replied. He quite agreed with Mr. Caröe that it was a good thing for the now and then to have archaeological papers. As architects he felt it was a great mistake to try to confine themselves to the practical everyday things. They should all take an interest in archaeology in some way or other, as it had direct bearing on their work. Especially now that they were in the precincts of Westminster Abbey it would be admirable if, as Mr. Caröe suggests, students took the opportunity of more frequent visits to the Abbey and studying what was one of the most unique buildings in the world. Mr. Warren's paper was entirely archaeological, and was difficult to criticise it. The only thing would like to suggest was that where there was so much pulling down, excavating, and rebuilding all over London, and certainly in some of the most historical sites outside the City, there should be some society formed so that all these valuable finds relating to the history and daily life of the people of the past should be collected and stored in some building. To a certain extent they were that for the City in the Guildhall, but he knew great many things found went into private hands. In the case of such finds as Mr. Caröe had shown of pottery and spoons and other interesting articles they should be put in some museum where they could be always seen.

Mr. Micklethwaite, in reply, said as to the story of the Temple of Augustus or Apollo, as it was sometimes called, he was afraid it was nothing but a legend. Some years ago when excavations were going on in the cloister for the purpose of fixing the engine for blowing the organ he did see fragments of what undoubtedly Roman mortar. There had been the materials of a Roman building somewhere, but there was no Roman wall or anything of that sort. There were fragments of old stonework with Roman mortar stuck on. There was the post which used to lie on its back in Margaret's Churchyard, and which, he believed, was in the vestibule of the Chapter House. It had a couple of letters on it which had the appearance of being Roman, and it was thought to be a Roman milestone. Probably the Roman passage of the river was at Westminster, or less on the site of Horseferry. That was speculation, but a good many people held that view. With regard to a Temple of Augustus being the church site, he could tell them a tale. He was old enough to remember a clerk of the works of Westminster Abbey whose name was Wright, and this clerk of the works came to Mr. Scott's office where he (the speaker) then, and told them he had made a great discovery—he had discovered one of the stonework

the Temple of Augustus Cesar. Some of them went down, and there he had got a panel with the initials "A.C." which he concluded meant Augustus Cesar. Unfortunately one of them recognised it as one of the missing posts of the tomb of Anne Clevees. That was the first evidence he could give them of the real existence of a Temple to Augustus Cesar. Had he spoken longer one of the things he would have insisted upon a little further was that a very strong ruling matter in the development of the church was its continued use. The church never went out of use. They had no tin tabernacle; they wanted the church was being restored; they wanted a church to use, and the rebuilding had to be done piece by piece and in such a fashion that some considerable part of the church was always fit for use. If they went into the details of the rebuilding, especially Henry III.'s work, they could see how the earliest parts were built. If they looked closely to the building they could trace bit by bit how the work was done without disturbing the piers. There were little details in the order of the work which could only be proved by looking at the building itself. It could be seen how things changed as they went along, although the general effect was the same. Mr. Carde spoke of the under-building of piers in the crossing, but that certainly had not taken place there, was not, however, an uncommon thing, and they found it done at Ripon and York. At York they found a perpendicular tower and they carrying it. If they went into the covered top of the roof high up above they found the main tower still visible.

Special Meeting.

The Chairman announced that there would be a special general meeting held at 7.15 on Friday, December 9, to pass the following by-law:— "The Association shall not make any dividend, division, or bonus in money between any of its members." The reason for that was they were claiming exemption from the rates which is a very heavy item, and it was necessary that they should get this small change in the by-laws. The meeting then terminated.

THE SURVEYORS' INSTITUTION.

An ordinary general meeting of the Surveyors' Institution was held on Monday at No. 12, St. George-street, Westminster, S.W., Mr. T. Steward, President, in the chair. Mr. J. C. Rogers, Secretary, read a list of donations to the Library and the Library Fund, a vote of thanks was accorded to the donors of the motion of the Chairman.

The Building Surveyor.

Mr. C. John Mann then read a paper entitled: "The Building Surveyor, His Training and etc." After some preliminary remarks, he said that the term "quantity surveyor" was comparatively recent origin. The members of the profession were, forty or fifty years ago, called surveyors or building surveyors. The demand for their services came in with the system combining all trades in a contract with one order, which at this time had become general. At an architect should speak of a surveyor as "a quantity surveyor" or his "measuring surveyor," as the case might be, was natural and doubtless quite right, because that generally the position a surveyor took in regard to the architect, his work, and his earnings. The fact that other branches of the profession came under the general designation "surveyor," might, in the minds of some, be a misleading term, in the desire for a prefix or some distinguishing term to mark those who specially dealt with quantities. The nature of the business the surveyor was so seldom understood by employers, particularly private clients, that this, he thought, a reason why the name by which they were called should be very much different to the architects through whom they got the production to most of their work. Those who had a sufficient quantity of work of a remunerative character fully to occupy their time, probably saw no objection to a title which appeared distinct from one description of work, but the state of things did not apply to the greater number, particularly to those commencing practice, and he thought many would prefer a restrictive distinguishing name if one could be found. As business increased and the quantity practice became definite, the designation "quantity surveyor" might be appropriate and distinct, but there were important matters connected with buildings, referred to surveyors' settlements, which embraced a much larger field than was covered by this designation. It

was only a line line that separates the profession of the architect from that of the surveyor, though most of them would agree that the more distinct the practice is, the better. In the event of any dispute or misunderstanding with the employer, the architect and the surveyor could take up their proper duties and positions with much greater freedom and force than was possible where one had combined both duties. He had more than once had serious disputes laid before him arising from the latter course, and involving law suits as well as arbitration, in cases where the employer had not been fully informed of the circumstances. It was interesting to note that the Birmingham Architectural Association had recently protested against the increasing amount of architectural work put into the hands of their city "surveyor," and the Wolverhampton Architectural Association had protested against the "unfair custom of entrusting architectural works to be carried out by the borough engineer's department." The advertising columns of the professional papers also showed that there was a considerable mixing up of the various branches of surveyor's work, and an attempt had been made to form a separate institution or association for quantity surveyors only. Personally, he did not think a sufficient number of qualified surveyors of good standing would be found willing to tie themselves down to quantities only, particularly having regard to the present tendency to lower remuneration for quantity work. Their practice in taking out quantities and in other work properly belonging to their profession soon proved what kind of surveyors they were, and he did not think it improved their position or independence to call themselves "quantity" surveyors, as if quantities formed the only legitimate part of their practice.

Training.

The surveyor should commence his career by serving his time in a surveyor's office, and between sixteen and seventeen was the best age. Except under special circumstances a pupil should be bound for four years. In some respects it was an advantage for him to spend a year in the shops of a first-class builder or on some building during its erection, but this must not disturb his training as pupil with the surveyor. Speaking generally, he did not think that in these days there was time for this, and the advantages to be gained were not unmingled with some disadvantages. By carefully regarding work in progress and taking every opportunity of following out details in the office and reading up special subjects, the pupil should become conversant with the details of construction and of the work connected with the various building trades. The surveyor's pupil could not too early learn to take responsibility, beginning of course with small things. The nature of the work he would first be called upon to do was simple, but until he could do it with precision and feel his responsibility in regard to it, he was worse than useless. The pupil need never be asked or expected to take the responsibility of any work that he had not mastered, but once trusted he must never fail. He must also learn to work quickly without feeling that the pressing rate at which the work was done is the slightest excuse for a mistake. Squaring dimensions, casting abstracts, fair copying, tracing, were all very simple, but the work must not be allowed to be taken in hand, for any use that was to be made of it, till the pupil had acquired precision and quickness together with a sense of responsibility. Distinct writing and figures, without flourishes, were indispensable. Nothing was more vexatious than to have to stop in the middle of a long cast and refer to other papers to determine whether what, at the first glance, you took for a 3 but subsequently thought might be a 5, was possibly a 6. It was the practice of some to place their sons for a short time, say twelve months or less, in different offices, as for instance, in the office of an estate agent, a builder, an architect, and a builder surveyor. Though they were often important well-known offices, he regarded this as a great mistake, for the youth could only occupy a very subordinate position in any of them, and under the most favourable circumstances he became a sort of Jack-of-all-trades and master of none, with the dangerous reputation of having been in the office of this and that important firm and having a very indistinct knowledge of what it was he did not know. The pupil, having established his reputation for reliability in small things, and added to his stock of knowledge the various terms used by surveyors, their abbreviations, and to a

considerable extent their meaning, passes on to abstracting and billing. Here it was, he thought, that many young men neglected to take full advantage of their opportunities, particularly in those cases where the system of taking off was to complete each item of the work in every trade with its consequent deductions, rather than to take off in separate trades. The careful and interested abstractor would look at each dimension and its description as he went on, and thereby learn the details of construction, with the relative sizes of the various parts making up the materials and labour connected with the whole of each item of the work. If pressure of time would not permit of this being done while abstracting, it could be done when the bills of quantities were finished, and perhaps sometimes before the drawings and specification go out of the office. This was not only a stepping stone to taking off, but also enabled the pupil to understand how to measure up works in progress. Every opportunity of acquiring a knowledge of pricing, which was, in perfection, almost an art in itself, should be taken advantage of. These would occur in moneying out, and making up estimates and builders' accounts. The pupil should, as occasion offered, be questioned by the principal with the view of testing his rate of progress and acquirements. Method was a most important factor in the profession of a building surveyor. Without very rigid order it would be impossible to supply accurate bills of quantities or bills of measurements. Another great benefit arising therefrom was fully realised when measuring up the variations on a contract and preparing bills of extras and omissions. In measuring variations the extras were generally fairly visible, and in any case attention was sure to be directed to them by the builder or his foreman; but the unseemly omissions could only be traced from the dimensions taken for the original quantities, and things not taken in their proper order were liable to be overlooked. The pupil must realise that, with the most elaborate specification and detail drawings, there might be a few discrepancies, which in taking off quantities were sure to be discovered, as well as matters which it might be difficult or impossible to delineate or describe so clearly as not to raise a doubt about them. Moreover, the constant introduction of new inventions, materials, and methods of construction might make it necessary for the surveyor preparing the quantities to see the specialist connected with them. All these points rendered it necessary for the surveyor to keep a neat query paper on which to record them in order that he might refer them to the architect for settlement and embody them in the specification and drawings, if approved.

It was probable that the pupil's work would by this time be interspersed with some of that general work of which he should now have a fair knowledge, and which the preparation for, and the passing of, the professional examinations should fit him to undertake. He would, as one of the examiners, remind candidates for the examinations to be on their guard against a superficial knowledge of any of their subjects, such as was attained by "cramming." Even if they were perfectly capable in their typical subjects, they should take care that their knowledge was thorough on the other subjects they had taken up, covering ground of a very varied character, and full of pitfalls. Mere superficial knowledge, acquired with the object of satisfying the examiners for the moment, would not stand by one in after years. The pupil should not be diffident in asking questions, particularly with regard to terms used which he did not understand, exercising judgment as to doing so at times when they would not inconveniently interrupt the business in hand. The intelligent and industrious pupil would naturally be taken up by the seniors to assist them in their work rather than the indifferent and careless, and hence some would progress by leaps and bounds whilst others fall behind. A few were naturally slow, but these he generally found come out right in the end, and if their articles expired before they had acquired the knowledge that was expected of them, he thought it was advisable in these cases to endeavour to make such terms as would enable them to remain until they became more proficient. A young man having served his time and passed his P.A.S.I. examination in Sub-division 3 would do wisely to remain in the same office in which he was trained or go to a good firm for some little time after, but it was a matter for his own consideration whether he

architect. The detail prices of the sub-contractor were filled in to the deposited priced copy of the quantities, in which the labour was separately set out. The architect made certain alterations in the details of his stonework, from the commencement and during the progress of the work. The builder, towards the close of the work, was asking for instalments evidently much in excess of what the contract sum would allow, and when asked for explanation said the sub-contractor for stone and labour was pressing him for money, and that, for the purpose of payment on account, he, the builder, had agreed with the sub-contractor as follows: To add the amount for all the labours together, and having found the proportional average amount of labour per foot cube of stone, to make up the total amount for 'stone and labour' in the quantities, and adopt this rate per foot cube for 'stone and labour' executed during the progress of the work. This price would have entitled the sub-contractor to the amount he was asking for. On looking into the matter I found that the calculation which the builder made was correct, as regarded the bills of quantities. Nearly all the architect's alterations in the actual work increased the size of the stone on the bed but not on the face labour. The sub-contractor, in estimating, had priced the cube stone at per foot very low and the detail labour prices high, so that, as the architect's alterations only added to the low-priced stone and not materially to the labour, the result, from actual measurements of variations, came out against the sub-contractor, who, finding both the original quantities and the measurement of variations correct, had to submit to what he called a loss, consequent upon his disproportionate and incorrect pricing. In very large buildings with detached blocks, where the works are carried out without uniformity, it is more necessary for the surveyor carefully to estimate approximately for the instalments. In some large works provision is made for payment of these services, but in works of less magnitude there is often no such provision, though most surveyors would be ready to assist the architect in such matters if asked to do so.

The Surveyor and the Architect.

"There are also questions of custom, and of matters which arise involving a certain familiarity with arbitrations and with legal decisions, where the experience and special training of the surveyor may be useful in consultation with the architect. There are many other matters in which the surveyor may assist the architect, from whom he gets his instructions, such as the clearing of a site on which are old buildings, party-wall questions, and light and air cases, and, occasionally, drains and sanitary matters connected with them. Such business is, of course, common to architects and surveyors. In private practice the employer seldom suggests the name of the surveyor who should take out the quantities, but the whole matter is left with the architect. In public matters it is now more often otherwise, and the boards or committees elect and appoint the surveyor to supply the quantities. The surveyor is not only generally indebted to the architect for his introduction to business, but often obtains assistance from him in seeing that his fees are paid by impecunious builders, or, in cases where his work has proved abortive by the employer altering his views, the architect will explain the nature and extent of the work done by the surveyor when otherwise it is often difficult to make the employer understand why he should pay him so much, or, indeed, anything at all.

Failure of Builder During Progress of Work.

"In cases where the builder becomes bankrupt during the progress of the works, great is the responsibility of the surveyor, both with regard to the accounts and the assistance it may be necessary to give the architect, in consultation on various causes and conditions in the specification and contract, and the employer's position with regard to these clauses. The troubles and difficulties with the position of the sub-contractors and other special tradesmen are sometimes such as tax the combined resources of the solicitor, architect, and surveyor to find a solution of the situation really beneficial to the employer. I knew of an instance where the employer's solicitors claimed, under the contract, the whole of the building as it stood at the time of the contractor's failure, although much work had been done by the various sub-contractors, for which the architect would in no course have specifically certified. Not

having done so, the builder had not, of course, paid them when he stopped. Unless this situation had been met, grave difficulty would have occurred through the impossibility of getting similar materials from any one else, and the sub-contractors declining to furnish any more if the work executed by them were not paid for. The architect had not certified, the sub-contractor had not been paid, and the employer's legal representative claimed the building as it stood and everything on the site. It goes without saying that an employer dealing with a competent architect and a competent surveyor places himself entirely in their hands, and it is much better on every ground that he should do so. It is their duty to look after the employer's interest, and they will do it.

Pricing and Settling up Accounts.

"In the matter of pricing and settling up the builder's account, usually done with the builder or his representative, very responsible work is required of the surveyor in the correct rendering of the prices in the deposited bills of quantities or schedule and the making up of prices for those items not in the schedule. There is often much controversy as to these before a final settlement is arrived at. In my experience, when the variations on a contract have been properly gone into, the result is, more often than not, an agreeable surprise to the architect, who, knowing the alterations that have been made in carrying out the work and the absolute extra work that has been ordered, has not fully realised the extent of the omissions consequent on these alterations and additions, and has been preparing himself and his client for a large extra. I find, although the surveyor has taken out the quantities, the architect sometimes settles up the accounts. This plan I do not believe to be the best for the employer; the surveyor, who knows every detail of the work in taking off the quantities, is in the best position to go into the variations.

"Serious disputes of a complicated character frequently arise in connexion with the erection of buildings under contracts, sometimes ending in the Law Courts or the arbitration room, and in any case furnishing much important work for the surveyor.

Surveys of Premises.

"One of the most useful branches of our profession is that of surveying and reporting on the condition of premises prior to their being taken on repairing lease. How many persons have suffered by neglecting to take precautions in this matter and have found out, when too late, the liabilities they have incurred through not having a proper survey made before they signed a lease with, perhaps, stringent repairing covenants. These surveys and reports are generally as to structure, condition of general repair, and sanitation. In making structural surveys it is often found, in the case of old buildings, that there are defects which it may be unnecessary and unreasonable to repair, to have remedied or made perfect, but it is none the less necessary a lessee may be about to take upon himself. In such cases they should be scheduled as being so excluded. Sanitary surveys and reports are, of course, frequently required by all sorts of clients. They may be very keen on taking a particular building, and may say they 'do not want any fads, they only want to know if the house is healthy to live in,' or they may say 'they have recently suffered from defective sanitation and that in this particular the house must be perfect.' Of course the surveyor will take care that, in either case, the sanitation is perfect.

Surveyors and the Law.

"It is essential, in spite of a little knowledge being a dangerous thing, for the surveyor to have more than a smattering of the law relating to buildings and the questions which may arise on them, and in consequence of them, before, during, and after their erection. We are indebted to the solicitors for a large share of our work, and it is the surveyor who has to interpret the repairing covenants of mysteriously worded leases, and translate into £ s. d. the various degrees of repair which from time to time come before him. In disputed accounts, the amount to advise a client to pay into Court is a matter requiring great consideration, as much cost may be saved or lost in such matters."

Quantity Surveyors and the Institution.

In concluding his paper, the author said:—
"Since the writing of this Paper certain

representations have been made to the Council of the Institution, with the view of obtaining a more distinct and definite recognition of the quantity surveyor members, and of increasing the sphere of usefulness of the Institution in their direction (a long-felt want), with the result that, under the guidance of our much respected and able President, the Council have approved and confirmed the appointment of a certain number of members to act as a Quantity Surveyors' Committee of the Institution, the quantity surveyors on the Council being *ex-officio* members of it. Any matters of interest connected with and affecting quantity surveyors' work may be considered by the Committee, whether brought under its notice by members of the Institution or otherwise. Matters brought before it may be discussed, resolutions passed, and reports made to the Council, who will deal with them as they deem right. This I am sure will be a great boon and advantage to every individual quantity surveyor member of the Institution, and I am glad to say that the Committee has already got to work."

Mr. H. Chatfield Clarke, in proposing a hearty vote of thanks, said that the architectural profession, as a whole, were deeply indebted to quantity surveyors for the very great aid they rendered architects in their work from beginning to end, and the more those two professions were kept separate in the carrying out of work, the better. The architect had quite enough to do with his plan and design, in the carrying out of the client's wishes, and with the specification, and the quantity surveyor could take a great deal of weight off his shoulders. He (the speaker) was very much indebted to the surveyors who had assisted him, and it was marvellous the manner in which they smoothed the way of the architect. He felt that it was a mistake for the architect to supply the quantities, and he advocated quantities being taken off by a separate surveyor. The status of the quantity surveyor was shown by the fact that, as a rule, the builder did not appoint quantity surveyors to take off the quantities. The builder was quite ready to accept the quantities of the architect's surveyor. As to whether quantities should form part of the contract, he never made the quantities part of the contract. He made the drawings and specifications, the basis of the contract, and left the quantity surveyor to settle with the builder as to any discrepancy in the quantities. The work was made easier if the quantities were not part of the contract. The writing of the specification by the architect he held to be a duty, and surveyors preferred to have the specification before them. As to verifying the quantities before sealing them, this was not generally done, but it was a very important matter. If it were done it saved a great deal of trouble in the end, and if there were any mistakes in them it was better to deal with those mistakes at first. They were all glad that a new committee had been formed by the Institution, and quantity surveyors were looking forward to that committee aiding them materially. As to urban and rural by-laws, it seemed to him that they would have to be re-considered, for it was absurd that the building regulations we have in towns should be applied to remote country districts, although he thought that a part of them should be. As to the plans of a learned judge for cottages he wished to build, he (the speaker) had seen them and he could hardly make head or tail of them. Still, that learned judge was treating the matter as one of principle, and no doubt the by-laws would have to be altered. Building was dear everywhere, and in the country it was impossible to build cottages at anything like a price that gave a reasonable return.

Mr. Gandy seconded the vote of thanks, and said that on large works he thought it was better for the builder to have his own quantity surveyor, so that if difficulties arose they could be thrashed out with the other surveyor. It did not matter on small works. As to quantities forming part of the contract, he did not think it mattered when the surveyors were well trained.

Mr. W. Woodward said that there were many works now being carried out by municipal surveyors which should be carried out by architects, though there were works which the borough surveyor was quite as capable of doing as the architect. He hoped that the protest in this matter would lead to good

results. He very much regretted the lowering of the remuneration of the quantity surveyor, but the surveyor was responsible for that himself. If the work was properly done by competent men, the money that was paid was well earned. He agreed that it was a waste of time for a young surveyor to spend a year in a builder's workshop, and if the young man had eyes to see he could get a great deal from visits to works in progress. He always made the quantities part of the contract. It was a perfectly fair thing if the quantity surveyor made a blunder, for that blunder to be rectified.

Mr. Stephenson said, as to fees for taking out quantities, that every job should stand by itself. He knew that their President had had work on jobs where 2½ per cent. had been the rate, and the remuneration was not great, whereas, on other work, where the rate was less, the remuneration had paid better. He did not think it mattered much whether quantities formed part of the contract or did not.

After a few remarks by Mr. Assiter, Mr. Guy M. Nicholson said, as to surveyors' fees, one could not avoid competition. What surveyors did grumble about was the tendency of public bodies to reduce the fees and increase the responsibilities. The London County Council and the Metropolitan Asylums Board made their fees strictly competitive—the Board having had work done as low as ¼ per cent.—but at the same time they bound the surveyor to pay for any work which was left out. Every one knew that in the rush of work and in order to get large works done more than one surveyor had to be employed on the same set of drawings, and it was extremely likely that a mistake would occur. The fees paid were really only sufficient for doing the work; they did not compensate the surveyor for the risk of paying for part of the building. In one of the M.A.B. jobs there were thirty-six cottages all alike. It would be said that that was a good thing for the surveyor. So it was, but suppose he had made a mistake in those cottages—it was a mistake thirty-six times over! They did not mind competition, but they objected to public bodies demanding more and giving less. It seemed to him to be the fairest way to make the quantities part of the contract, because the primary object of the surveyor was to get a competitive price for the work. If the surveyor were found to make a great many mistakes the remedy would be that he would not get work, and would have to retire. As to the architect's specification, he agreed that it was easier to get notes of the special points that the architect wanted, and to trust to knowledge of that architect's general practice for the remainder. He had a specification the other day of a very ordinary building which consisted of rather more than 200 pages, and everything was described three times over and in three different ways, and the specification did not agree, and the details did not agree with the specification. It was practically impossible for architects satisfactorily to take off their own quantities, for a busy architect had his time pretty fully occupied without having to do with quantities, which required incessant practice to ensure success. Perhaps in a small country practice the architect could take off his own quantities, but in other cases it was not fair to the client to do so. He thought it was a great advantage to go through the priced estimate before it was sealed up. The London School Board (now merged in the L.C.C.) always did that, and it saved in many instances a very awkward position arising. He agreed that it was an advantage on a big work for the builder to have a surveyor as well as the architect. That was compulsory in big Admiralty contracts.

The Chairman then put the vote of thanks, which was heartily agreed to, and Mr. Mann briefly replied. It was announced that the next meeting will be on December 12, at 4 p.m., when Mr. J. Jopling will read a paper entitled "Notes on Clay Working, more Particularly Bricks and Tiles." The meeting then terminated.

PROPOSED NEW CHURCH, ELGIN.—At a recent meeting of the congregation of the Elgin parish church it was decided to invite the following architects to send in plans for the new church, which is to be erected in that town:—Messrs. A. Marshall Mackenzie, Aberdeen; Robertson, Inverness; and Chalmers, Glasgow. The cost has been fixed at 4,000l.

THE REBUILDING OF VICTORIA STATION.

The enlargement of the West-end terminus of the London, Brighton, and South Coast Railway is only one item in an extensive scheme of alterations, of which the total cost will be at least 2,000,000l. For a long time past the company and the public alike have suffered from the limitations due to the small number of running tracks between Clapham Junction and Grosvenor-road, the narrowness of the Grosvenor Bridge, and the contracted nature of the approach to the terminus. From Clapham Junction to Grosvenor-road the permanent way runs along what is practically a continuous viaduct of brick arches with occasional girder bridges. This portion of the line has already been widened so as to accommodate four lines of rail; the widening of Grosvenor Bridge is now in progress, and extensive alterations in hand at the Victoria Station approach will shortly give ten roads available for traffic in place of the solitary pair—one "up" and one "down"—over which all trains now have to pass. The construction of new works outside the present station has made it necessary for the Elizabeth and Eccleston bridges to be raised by some 6 ft. In the case of the former bridge exceptional difficulty has been encountered owing to the fact that it was found necessary to sink to a depth of 30 ft. before reaching a sufficiently firm stratum of earth for the foundations. The altered level of the roadways upon these two bridges has involved a corresponding alteration in the level of Buckingham Palace-road.

We may here recall a curious statement connected with that portion of the line between Victoria and Grosvenor-road station. At the time when the original Bill of the railway company was before Parliament considerable opposition was raised to the construction of the line by residents in the neighbourhood of the proposed terminus and particularly by the Duke of Westminster. The chief reason alleged was that the noise caused by trains would constitute an intolerable nuisance, and to appease local sentiment the company undertook to roof in the whole of the line from the terminus to a point not very far from Grosvenor-road, the object being to confine or deaden the sound of the trains. Having obtained their Bill, the company were bound to erect the long line of roofing, but in consequence of a singular oversight on the part of those representing the local residents, no stipulation was made compelling the company to keep the construction in repair. The covering of the railway was duly executed, consisting of iron columns and other members supporting iron roof systems covered with glass. After a time the company seem to have discovered the flaw in the Act of Parliament—through which they drove their trains in substitution for the proverbial coach and horses—and decided to let the line of roofing fall into a state of decay. Broken glass was not replaced, and as portions of the unpainted ironwork became dangerous through oxidation they were gradually removed. Until quite recently considerable portions of the old columns and roofing still remained on this portion of the railway, but they have been removed lately under powers granted by the new Bill obtained by the Company.

Turning now to the new terminus, the width will be 320 ft. and the length 1,500 ft., as compared with the present dimensions of 230 ft. wide by 800 ft. long. The future train accommodation will include four island platforms and one side platform, all 1,100 ft. long, so as to permit two trains to occupy each of the new platform edges at one time. Unfortunately the scheme of the new station is seriously impaired by the existence of the Grosvenor Hotel, occupying a position which would have been invaluable for traffic requirements and the convenience of passengers. Like the directors of other railway companies, the directors of the London, Brighton, and South Coast line were unable to foresee the enormous development that has taken place in railway traffic, and in permitting the erection of the hotel on the site chosen they left a heritage of trouble to their successors. Subject to this criticism the general arrangement of the new station is good. Access to the departure platforms will be gained as at present from the forecourt, and egress from the arrival platforms will be afforded by a new and commodious exit leading into Buckingham Palace-road. At one side of this exit a new parcels office, connected by a subway running the entire width of the station, has already been built, and from the same point a

wide roadway for vehicular traffic will be carried through the station to the high bridge outside. The present mean appearance of the forecourt will be improved by the erection of a wing to the Grosvenor Hotel, extending far as the miserable sheds which form the front of the South-Eastern and Chatham Railway station, and on the ground floor of the hotel extension will be situated the booking hall, waiting-rooms, and offices.

Unfortunately there is nothing satisfactory to report relative to the architectural treatment proposed for the façade of the hotel extension. It might have been hoped that the company would have realised the necessity for erecting a structure in every way worthy of the important site in their hands. In our opinion the most appropriate way of dealing with the building on the forecourt of the station would have been by joint action on the part of the two railway companies with the object of continuing the hotel buildings along the entire frontage, a novel idea, by enlisting the co-operation of a competent outside architect so as to ensure that the new structures should be architecturally worthy of the importance of the occasion and the site. That this point has been strongly and authoritatively brought before the Board of Directors we have reason to know. But the only answer was in the shape of a *non possumus*—the façade is to be carried out by the Company engineer; and we only too well know what the result is likely to mean.

THE QUANTITY SURVEYORS' ASSOCIATION.

An ordinary general meeting of this Association was held on Monday, at the Duke's Sale, Holborn Restaurant, Mr. Walter Lawrance, F.S.I., President, in the chair.

The Hon. Secretary, Mr. F. B. Hollis, reported the notice convening the meeting, and also minutes of two previous meetings, of November 18, 1903, and March 2, 1904, which were confirmed.

The President then made a statement in reference to the position of the Association and what had been accomplished since the confirmation of the Articles of Association at the meeting on March 2. The articles were sent to the Board of Trade, and the Association was subsequently informed by the Board that objections had been received from the Surveyors' Institution to the grant of a licence to the Association. July 20 was appointed by the Board to receive deputations from the Surveyors' Institution and the Association to the objections and replies thereto, but those of the Association's representatives were ready to attend they were informed on July 19 that the Surveyors' Institution did not intend to oppose. The petition of the Association then went before counsel of the Board of Trade and his amendments were received on September 10, and these amendments, only one of which the Association could take serious objection to, were approved by the Council of the Association, and on October 12 the licence was finally granted. The one serious alteration the Board of Trade made was as to the use of the letters "Q.S.A." The Board intimated that they could not grant a monopoly of any letters that could be done only by Royal Charter. The members could use the letters after their names, but so could outsiders if they wished.

The President then dealt at some length with the objections of the Surveyors' Institution to the replies thereto. Proceeding, he expressed to Mr. Hollis, the Secretary, the thanks of the Council and the members for the zeal and heartiness Mr. Hollis had thrown into his work, and the grateful thanks of the Association were tendered to him.

The President then referred to the advantage to young quantity surveyors of admission to the Association as students, and he stated that it was the intention to bring forward for deliberation subjects of interest to quantity surveyors. One grievance they had was that an uncompetent person was allowed to issue so-called bills of quantities and receive payment for them. That was the cause of an unfairness; either the building owner or the contractor must suffer in a greater or less degree. Up to the present time there had been no restraint on the issue of bad quantities, what was worse for the protection of the profession, there had been no punishment or exposure of the offending party by

institutions of which he might be a member. The Association, in clause 13 of the Articles, dealt with this evil. Among other evils, the greatest obstacle they had to contend with was the fact that the public did not know them, and did not understand their work, and therefore could not know its great importance. Who was it who really decided what money was to be paid the builder? Undoubtedly the quantity surveyor's figures governed these matters, and very few of the general body of building owners understood this. One of the objects therefore should be to let the public have a better knowledge of the quantity surveyor and his duties. The outcome of this would be (1) the direct appointment of the quantity surveyor by the building owner, and (2) the payment of the quantity surveyor's fees by him. Why should the custom be continued of appointment by a third party and payment by a fourth? There was much to be done to improve the conditions of appointment and selection of quantity surveyors by public bodies. The conditions of some appointments were an absolute disgrace to the profession, seeing that quantity surveyors were willing and ready to accept such terms. As to the actual conditions of building contracts, the quantity surveyor had a very important question to settle—i.e., should the bill of quantities be the basis of the contract? There was much to be said on this subject, and also as to the wording of the clause to that effect in the contract; the clause in the present form of contract as agreed between the Royal Institute of British Architects and the Institute of Builders, etc., being, in his opinion, open to dispute owing to recent legal decisions. The nomination of the arbitrators was also worthy of very serious attention; in most instances the questions to be arbitrated upon were those with which a quantity surveyor should deal and not an architect, and all should do their best to have quantity surveyors' names inserted in the contract. Another very important question was that of a scale of fees. A settled scale of fees might not doubt prevent one from getting an occasional good fee, but at the same time it would also be a preventive against quantity surveyors being offered an inadequate fee, and might on the whole be for the general welfare. He most strongly protested against the idea that because a job happens to be a large one, that the fee should reach the lowestebb as regards percentage, especially with their clause 13; the extra responsibility, care and anxiety required to carry through a large job, or a job with very heavy quantities of particular work, deserved recognition. A scale of fees, if ever arranged, could not be based on the size of a job only—the class of work, the amount of detail required in the quantities, and, not least, the amount of responsibility thrown on the quantity surveyor must all be considered. Speaking of detail caused him to mention one point they should like settled; that was the measurement of stone. They were not pleased after spending weary days over measuring labours, to find them unpriced, or priced, with prices made to agree with the estimator's idea of the price per foot cube, irrespective of the quantities of labours given in the bills. He should like to see some arrangement arrived at with contractors on this point. The Association, he hoped, would be able to keep a register open to members for situations vacant and for assistants, temporary or permanent, requiring situations. Questions on professional subjects, addressed to the Secretary, would be laid before the regular meetings of the Council, and answered by them or referred to experts' opinion. The Council propose holding the first annual dinner of the Quantity Surveyors' Association in February, the ordinary general meeting, in accordance with Article No. 101, would be held in April, and the annual general meeting in May. It is proposed to hold examinations in May. The Council would be glad to receive the offer of papers fully discussing or to inaugurate discussions on any subject of professional interest.

Mr. Nixon asked if there was any chance of getting a Royal Charter so that they might use the letters Q.S.A.?

The Chairman said there was not the slightest doubt that the Council would do everything they could to obtain a Charter as soon as possible, and there was no doubt that they would meet with strong opposition.

In answer to other questions the Chairman said they would hold regular meetings as soon as they could arrange a syllabus. As to forming a library, the Association in time would, no

doubt, take all the steps they could to educate the young surveyor and to provide information for older members, and a library would naturally be one of these steps.

Mr. Gate, Vice-President, said he did not think that anyone not a member of the Association would dare to use the letters Q.S.A., for he would be liable to serious exposure and disgrace. What the Association wished was that the public should get to know that those letters indicated that a man using them was prepared to pay for any errors he might make in his quantities. For his part he meant to use the letters and for that reason, and if an outside quantity surveyor used them he would be exposed.

A vote of thanks to the Chairman for presiding and to Mr. Hollis for his services as secretary brought the meeting to a close.

THE BUILDERS' BENEVOLENT INSTITUTION.

The fifty-seventh annual dinner of the Builders' Benevolent Institution was held in the Whitehall Rooms, Hotel Metropole, W.C., on Thursday evening last week, Mr. W. Downs, President, presiding. There were also present Colonel G. Haward Trollope and Messrs. C. J. Bennett, J. W. Blackham, H. W. Bayne, H. H. Bartlett, H. D. Blake, C. Bussell, C. Braby, H. A. Bartlett, J. F. Bolding, J. M. Beveridge, L. Bennett, A. Burnell-Burnell, F. A. Crisp (Master of the Carpenters' Company), J. Howard Colls, T. Sturge Coterell, W. Casselton, T. E. Clarke, T. I. Cannell, R. Downs, T. Gregory, T. H. Griffiths, H. Gibbs, C. Gude, W. Higgs, F. Higgs, C. G. Hare, B. Hellyer, W. M. Hill, T. Hall, T. A. Hunt, C. V. Hunter, A. W. King, D. W. McInnes, H. Le Marchant, F. G. Minter, S. W. Neighbour, G. N. Nicholson, A. E. Parker, J. Randall, A. Ritchie, J.P., J. Sabsy, S. Stiff, T. Stirling, G. Gilbert Scott, E. Toms, C. Watkins, S. Michael Young, Douglas Young, T. Costigan, Secretary, and others.

The loyal toasts having been honoured, Mr. B. Carter proposed "The Imperial Forces," to which Colonel G. Haward Trollope suitably responded.

The Chairman then gave the toast of the evening, "The Builders' Benevolent Institution." He said that the Institution was established fifty-seven years ago, since which time some 276 pensioners had been assisted. That gave an average of about five new pensioners each year, which might seem to be a small number until they realised that the Institution was limited in its work by the amount of the funds, and he appealed to the friends of the charity for help. At the present time there were thirty-one men on the list and twenty-nine widows—the men received 42*l.* a year and the widows 21*l.*—and he might add that husbands and wives were not separated. One point he would strongly impress on them was as to the way in which the Institution was managed. He knew of no similar institution that was managed on more economical lines, for of the total income received some 89 per cent. was given to the pensioners, which left 11 per cent. to the management. This was possible mainly owing to the care of their Secretary, Mr. Costigan, assisted by the staff and a very able and willing committee, who personally looked into each case and saw that only those properly qualified came on to the list. On behalf of the subscribers and donors, he thanked the committee for their care of the affairs of charity. Their aim seemed to be to do as much good as they possibly could with the funds at their disposal and at the same time to consider the feelings of the pensioners as much as possible. There was a balance on the current account of 350*l.* The income was derived from builders, builders' merchants, architects and surveyors, and others. The committee thought, and he agreed with them, that they ought to have the support of more builders; if it were not for the support of other friends, the trade list in itself would be very small. The committee could not expect every merchant's firm to subscribe largely every year, but they felt that every builder ought to be a subscriber. The Bricklayers and Tybers Company, he might add, had given room in their almshouses for two pensioners. In conclusion, he asked them to think of the blessing and comfort they could afford by their help to many who, without aid, would be doomed to an old age of want and suffering.

Mr. Alex. Ritchie, J.P., then gave the toast of "The City Companies." He thought that the City companies ought to help such charities

as the Builders' Benevolent Institution. They did a great deal in furthering the cause of charity, and they were always willing, not only in the City but in greater London, to extend their munificence and bounty.

Mr. F. A. Crisp, Master of the Carpenters' Company, briefly acknowledged the toast.

Mr. J. Howard Colls then proposed "The President," and Mr. Downs suitably replied.

Mr. F. Higgs proposed the toast of "The Architects and Surveyors" coupled with the names of Mr. G. Gilbert Scott and Mr. Guy Nicholson. Architects of the present age had no reason to be ashamed of their position in comparison with past ages. As we went through London to-day and saw the fine buildings—some of them he might call dreams in stone—we saw that the present-day architectural works were equal to those of the past and gave promise of a great future for the profession. Much as builders owe to architects, they had a more intimate knowledge with quantity surveyors, in whose hands they generally fell safe.

Mr. G. Gilbert Scott, in responding for the architects, said he felt honoured in being called upon to reply for their grand art. The Institution was for the benefit of those builders who had fallen in the battle of life, and the fact that architects were invited to the dinner showed a fine spirit of forgiveness, and he had no doubt that architects reciprocated that feeling. Architects could not get on without the builders, nor unless there was a friendly feeling with the men who put their dreams and castles in the air into concrete shape and form. He had heard it said that the builder was the architect's natural enemy; he did not believe it, and certainly the builder would never be his enemy.

Mr. Guy Nicholson having responded for the surveyors.

Mr. Val Hunter proposed "The Vice-Presidents, Committee, and Stewards." The men connected with the charity were business men and they extended their charity wherever possible.

Mr. J. T. Bolding, in replying, said the work of carrying on the affairs of the charity was considerable, but the reward was great when they saw the good that was done. During the last two or three years much had been done to improve the position of the pensioners. The amount of the pension had been increased by 3*l.* a year; the pensioners were elected after much scrutiny but without putting them to the trouble of canvassing and of a contested election; the limit of age had been decreased from sixty years to fifty-five, and they had saved the pensioners much trouble in making it no longer necessary for them to come month by month to collect their small pensions. In the majority of cases the amount was sent by post. The Institution had an assured income of only 1,100*l.* per annum and the money to pay to pensioners actually amounted to 2,100*l.*, so that they needed a thousand pounds to meet their liabilities. There was no other institution managed with less expense; they paid 2,100*l.* a year in pensions and their total expense for printing, salaries, rent, etc., came to 260*l.* only per annum.

During the evening lists of subscriptions and donations were read, the total amount being 894*l.* 2*s.*, of which 738*l.* 6*d.* was on the President's list. The President himself contributed 100*l.*, the Institute of Builders 50*l.*, and Messrs. G. Trollope, Sons and Colls & Sons, Ltd., 20*l.*

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, S.W., Mr. J. Williams Beun, M.P., Chairman, presiding.

LEAS.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 8,725*l.* for paving works; 12,000*l.* for public baths purposes, and 10,000*l.* for erection of lodging-houses; Greenwich Borough Council, 950*l.* for purchase of site for public library; Hackney Borough Council, 5,339*l.* for paving works; and Woolwich Borough Council, 4,500*l.* for granite paving works, and 1,000*l.* for assisted wiring of consumers' premises for electric lighting, etc. Sanction was also given to Lambeth Borough Council to borrow 2,044*l.* for street lighting purposes, and to Shorehedge Borough Council to borrow 9,189*l.* for street improvement and paving works.

Port of London Bill.—The Parliamentary Committee recommended that a Bill be proposed in the next session of Parliament relative

to the administration of the Port of London, in accordance with the resolutions passed by the Council on November 8, and that the costs and expenses of promoting the Bill be defrayed out of the county fund.

After discussion the recommendation of the Committee was carried by eighty-seven votes to twenty-eight.

Drury Lane Theatre.—In reply to Sir Algernon West and Mr. Johnson, Mr. Yates stated that the result of the arbitration as regards the Council's requirements relative to Drury Lane Theatre was that 143 requirements were made by the Council, and of these 111 were confirmed absolutely by the arbitrator. Fourteen were modified and confirmed, and eighteen were not confirmed, although the arbitrator said some of them were desirable, but that they were matters of management and not of structure. Consequently he could not confirm them, but he thought the Council were justified in the line they had taken. The real test as to whether the Council had succeeded arose on the cost of the arbitration, and the arbitrator had decided that the Drury Lane Theatre Company should pay the whole of it.

Mr. Strans asked if it would not have cost the company less if they had accepted the Council's requirements in the first place instead of going to arbitration.

Mr. Yates replied that he had not the official figures before him, but he thought the reply would be in the affirmative.

Brickmaking Operations: Norbury Estate, Croydon.—The Housing of the Working Classes Committee recommended that an estimate of 4,000, in respect of brickmaking operations on the Norbury Estate, Croydon, during the season 1904-5 be approved. The Finance Committee, in reporting upon the matter, pointed out that 10,500, had already been authorised for brickmaking on the estate. Up to the present between 6,000,000 and 7,000,000 bricks had been made, and were now lying on the site. Owing to difficulties with the Croydon Corporation, building operations had not yet commenced, and this delay altered the financial aspect of the operations.

Mr. E. White in moving that the recommendation be referred back, said the losses were so serious that he hoped the Council would not go on piling up a sum which would have to be added ultimately to the cost of erecting houses for the working classes. It seemed to him that it was one of the most disastrous experiments the Council had ever made.

Mr. Gaskell seconded the amendment.

Mr. Phillimore said he thought that if they made good bricks last summer it would be a pity to stop the work. The losses in the past were due to bad seasons and poor management.

Mr. Hunt remarked that one-third of the bricks on the ground would have to be carted away and shot on the dust-heap.

Mr. Dew argued that they had to move a great clay mound to the site to enable them to build, and it was cheaper to turn it into bricks than to cart it away.

Sir J. McDougall contended that the bricks they made last season showed a profit of from 10s. to 12s. 6d. a 1,000.

The amendment was defeated, and the recommendation adopted.

Housing.—The Housing of the Working Classes Committee also reported that Redman-buildings on the Portpool-lane frontage of the Bourne Estate, Holborn, have been almost completed. The buildings contain accommodation for 710 persons in twenty-seven tenements of four rooms, fifty-eight tenements of three rooms, thirty-one tenements of two rooms, and eleven tenements of one room. The third section of Radcliff-buildings on the Clerkenwell-road frontage has also been completed, accommodation being therein provided for 208 persons in six tenements of four rooms, twenty-two tenements of three rooms, six tenements of two rooms, and two tenements of one room.

Coleridge's Residence.—On the recommendation of the Museums Committee, it was resolved to affix a memorial tablet to No. 71, Berners-street, to commemorate the residence thereof of Samuel Taylor Coleridge.

The Council adjourned at a quarter-past six. **Premises for the Council.**—Among the notices of motion is the following in the name of Mr. J. Piggott:—

"That, having regard to the fact that the Council's present rental in respect of the inadequate and disconnected chief offices, comprising over five-and-twenty separate blocks of buildings, amounts to over 34,000, per annum, and also having regard to the in-

creasing extra expense, loss of time, and inconvenience caused by the departments of the Council's service being so far removed from each other, and to the pressing need for adequate office accommodation for the staff, it be referred to the Establishment Committee to consider and report as quickly as possible upon sites available for County Hall and offices, and that the Committee do submit a definite recommendation for the acquisition of the site which, in their opinion, is most suitable for the Council's purposes."

ARCHITECTURAL SOCIETIES.

THE NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. William Glover, F.R.I.B.A., past President of this Association, who has in recent years given 1,000, in consols and other valuable donations towards the permanent premises and to aid the work of the society, has now promised further aid in the following letter he has written to the Hon. Secretary:—

"66, Tyrwhitt-road,
Brockley, London, S.E.,
Nov. 22nd, 1904.

A. B. Plummer, Esq., F.R.I.B.A.,
Hon. Secretary.

Northern Architectural Association.
My dear Mr. Plummer,—At our meeting in London, on a deputation to the Council of the R.I.B.A., I promised, if they arranged their meetings in Newcastle, that I would commemorate the event by a gift for the benefit of the profession. This was agreed to, and I have therefore much pleasure in giving 1,000, for the following objects, and will discuss the division with your Council:—

1st. Additional half, to complete the purchase of the house for our Association, which I have been so anxious to see accomplished.
2nd. The Architects' Benevolent Fund.
3rd. The scheme of Sir Aston Webb, R.A., for the higher education of architects.
The conditions for the two latter are that the funds are invested in trustee securities; the nominations of the Council of the Northern Architectural Association to be first considered, so far as the interest on the funds will allow. This will enable me to carry out three leading principles which have influenced me through life:—1st. To spend my money where I made it. 2nd. To assist those poorer than myself. 3rd. To endeavour to leave the world better than I found it. I do sincerely hope that the effort made for the higher education of our students will make them better men than we are. With kindest greetings to you and all my old colleagues and friends.

Yours very sincerely,
WM. GLOVER."

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—On Tuesday, 29th November, Mr. Chas. B. Howdill, A.R.I.B.A., President of the Leeds Camera Club, gave a lecture on "Colour Photography for Architects." Commencing with a short description of the composition of light the lecturer dealt fully with the various processes of colour photography at present employed, and showed slides illustrating each. Mr. Howdill then showed a number of slides of modern and medieval stained glass taken by various processes, some taken by a combination of telephotography and colour photography, and finished his paper with a short demonstration of the Sanger Shepherd process. Many of the slides shown reproduced the colours of old glass, particularly that in the "Seven Sisters" window at York Minster, in a remarkable manner. Mr. W. Wonnacott, in proposing a vote of thanks to Mr. Howdill, referred to his own troubles in practising colour photography and also to the beauties of the Lippmann process, which had not been used by Mr. Howdill. Mr. Wonnacott also briefly described the new Sanger Shepherd camera, which would reduce the time of exposure very largely, and touched upon the cost of the process. Mr. J. D. Grace seconded the resolution, which was carried with acclamation, and the meeting terminated with the announcement that on December 20th Mr. Arnold Mitchell would speak on "Photography for Architects."

Illustrations.

CHRISTIAN SCIENTIST CHURCH.



THIS drawing, which was exhibited at the Royal Academy, represents a building of some interest in itself and because it is designed for a special sect, and hence we should have been glad if the architect would have furnished us with some little information in regard to the intention of the plan and design. All we have been able to obtain from him, however, after two applications, is that it is built with 2 in. common bricks and roofed with green slates, and that the gable front is in cement whitened. Further than that we must leave our readers to draw their own deductions.

CHELSEA BATHS.

THE scheme was chosen in a limited competition by the Chelsea Corporation.

The cost of the first section of the scheme which is to be carried out immediately, 21,000, and includes the men's swimming bath and slipper baths for both sexes. Artistic wells and storage tanks are also to be carried out at a cost of about 3,500. The ladies' swimming bath and Turkish bath are deferred till a future date, and are estimated to cost another 10,000.

The fronts will be carried out in red brick with Portland stone dressings, and the interior fittings will be of a simple and serviceable character, such of the old fittings as are being re-used, together with the existing engine and most of the laundry fittings of the present baths.

The elevations are designed to harmonise with those of the newer portions of the Town Hall, that being one of the conditions laid down by the Corporation.

NEW CHURCH OF ST. ENDA AT SPIDDAL, CO. GALWAY.

THIS church is designed in the spirit of the work seen in early Irish buildings, not necessarily copied in any part, but adopting those features which are characteristic of that early period and developing them to suit modern requirements, and the material at hand.

The situation of the church being an exposure on the Atlantic seaboard, it was deemed necessary to finish the tower with a parapet instead of projecting eaves. The north transept is roofed in two spans, and has a parapet returning against the tower; this gives an appearance of mass and solidity, and marks this part in contrast with the low eaves of the main building.

The sacristy is placed at the end of the south transept, and within this transept is a gallery for the choir. The north transept will contain a small lady chapel, and pews for the Rev. Killanin, one of the founders.

The chancel arch will be semi-circular, in orders, the inner springing from long corbels with carved terminations. It will be constructed in finely-chiselled limestone, and provision will be made for embellishing it with carving a future time. The roof will be of open timber work, and covered with Killaloe slates, in random sizes. The ridge covering will be cut from solid sandstone. The porch doorway will have round arches recessed in three orders and a plain for future carving.

The jambstones of doors and windows and arches and internal piers will be of Galway limestone. The workmanship will mostly be local production. The masonry, which is to a special feature, will be done by local masons; the leaded lights will be by Irish artists, executed in Dublin.

The foundation stone was laid on October and the building is now well advanced.

The architect is Mr. W. A. Scott, of Drogheda, near Dublin.

THE MILL HOUSE, ALDEBURGH.

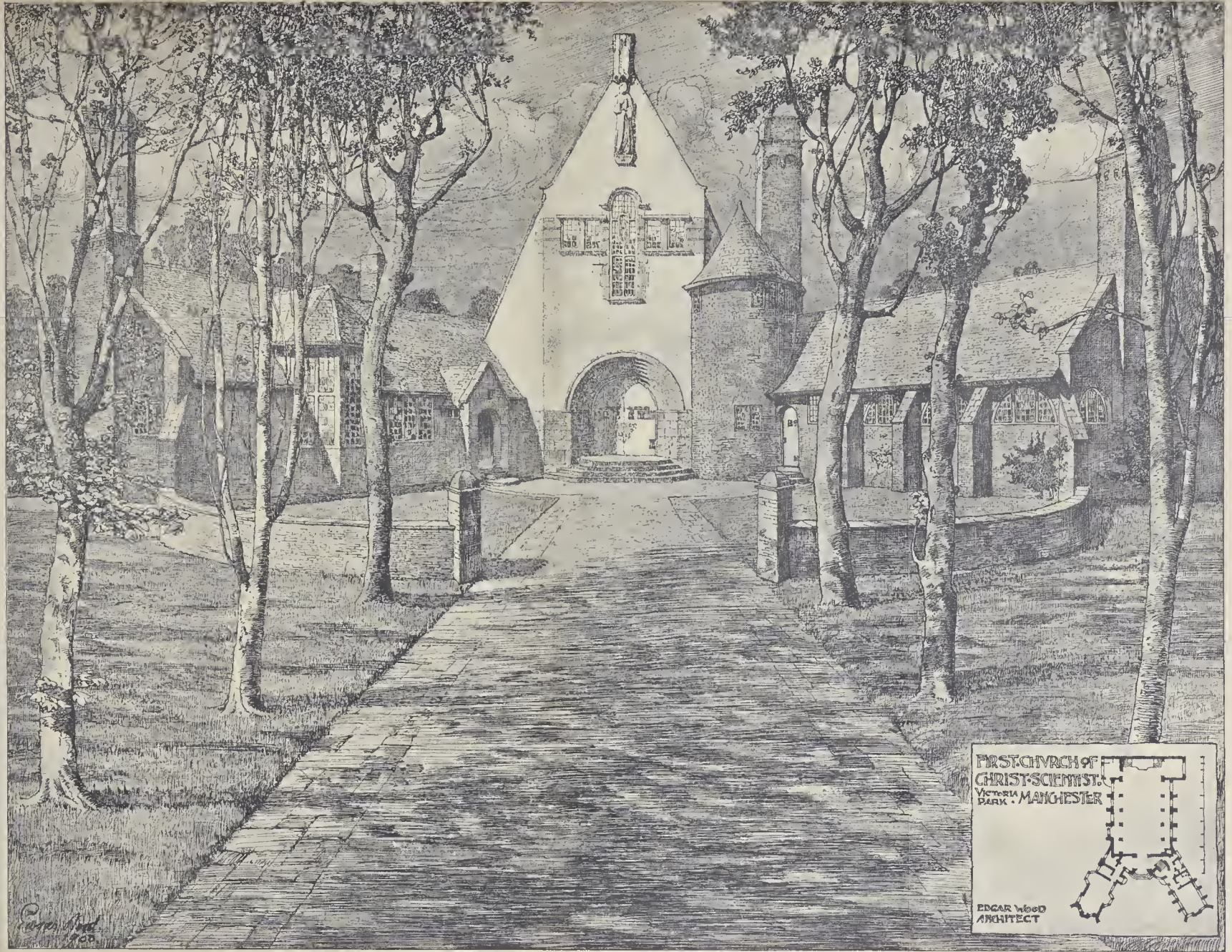
WE published in our issue of September a drawing representing the house which had been built, from the designs of Mr. R. A. Briggs, the form of additions to a disused windmill, near Aldeburgh, retaining the mill as an integral portion of the house.

With no disparagement to the drawing, two photographs subsequently sent to us by the architect, and which show the building from other points of view, seemed to us to bring out the picturesque effect of this rather novel experiment even better than the drawing, and we thought it therefore quite worth while to give these two further illustrations taken from the actual building.

A plan, and a short description of the work were given in connexion with the former illustration in our issue of September 10.

The photographs which are reproduced were given to the architect by Messrs. Henry H. & Sons, of Birmingham, who supplied all the casements for the building. The general contractor, as before mentioned, was Knowles, of Aldeburgh.

WAR CORRESPONDENTS' MEMORIAL.—At an annual dinner of the London District of the Institute of Journalists, the Chairman, J. D. Irvine, announced that the memorial to the war correspondents who fell in the South African War, 1899-1902, will be unveiled in St. Paul's Cathedral on January. The memorial has been designed by Mr. Goscombe John, A.R.A.

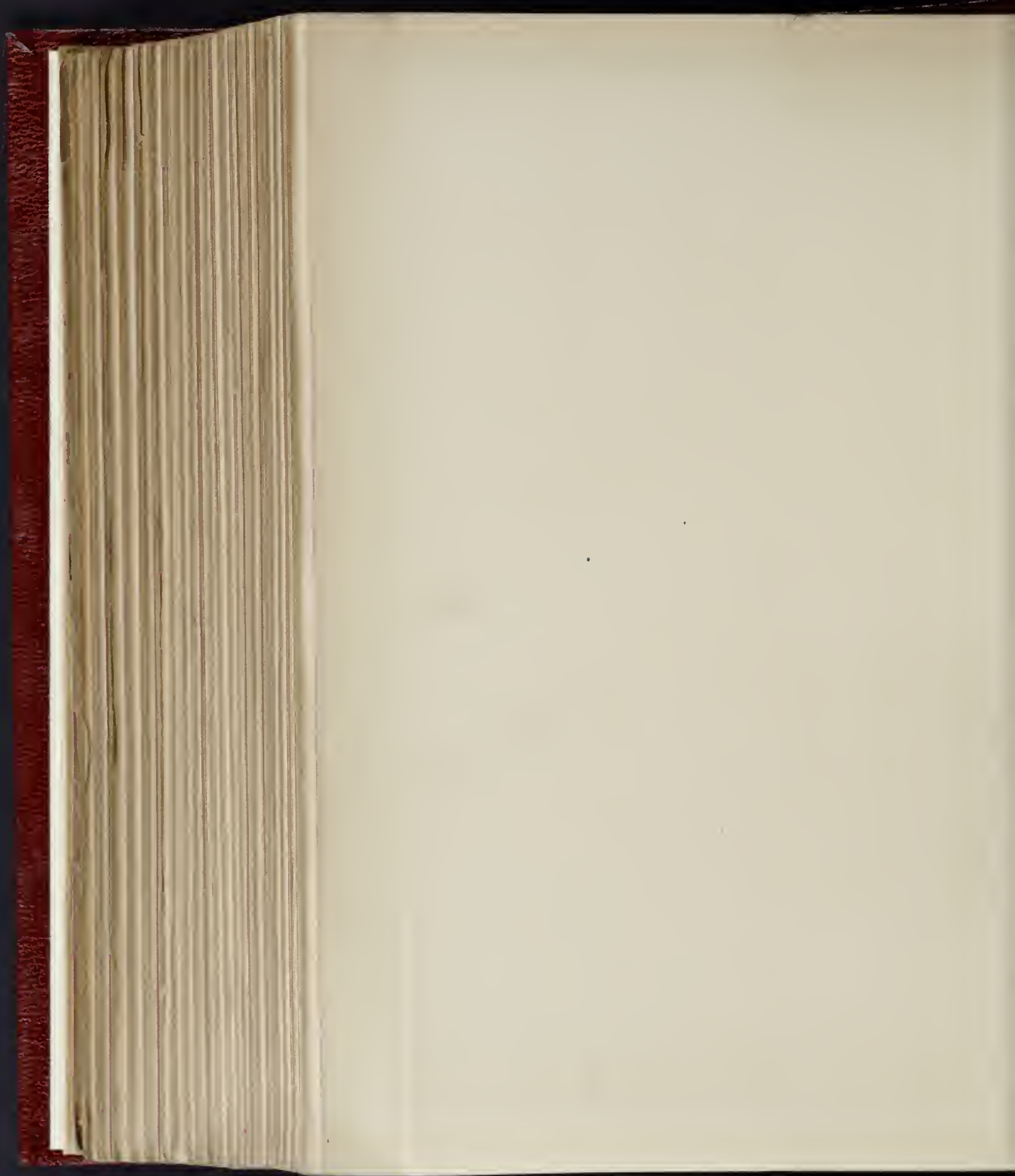


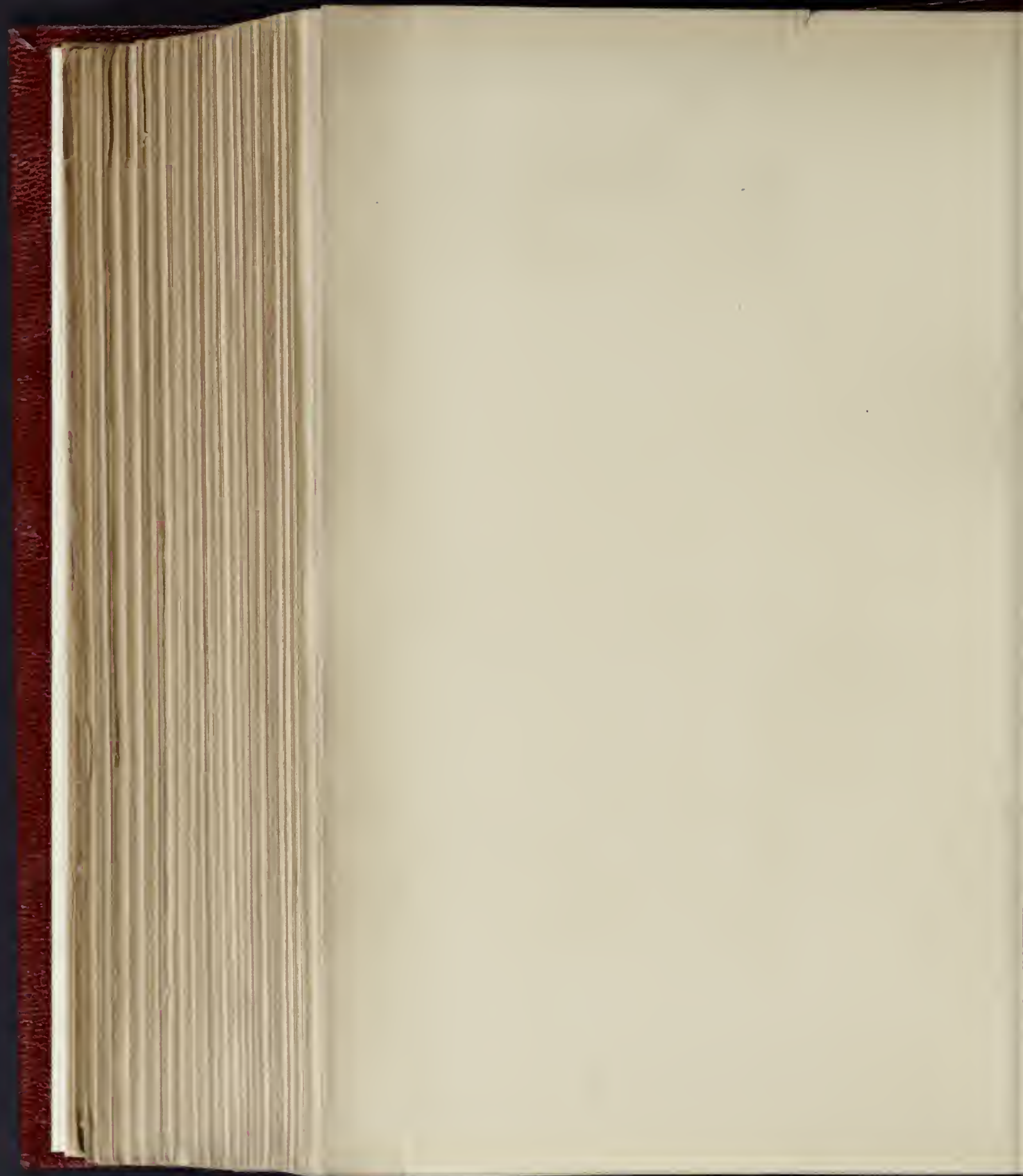
Edgar Wood

FIRST CHURCH OF
CHRIST SCIENTIST
VICTORIA PARK • MANCHESTER



EDGAR WOOD
ARCHITECT





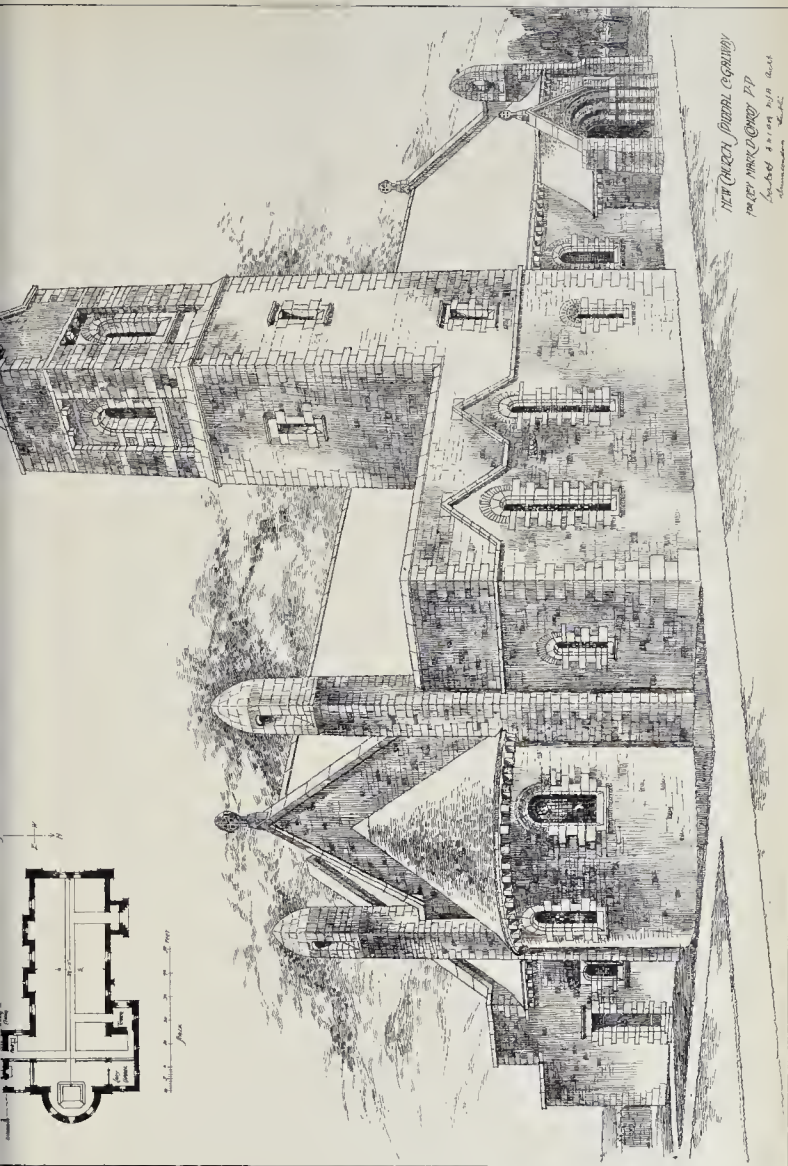
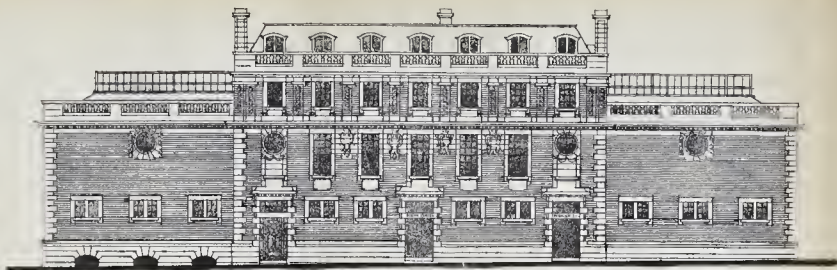
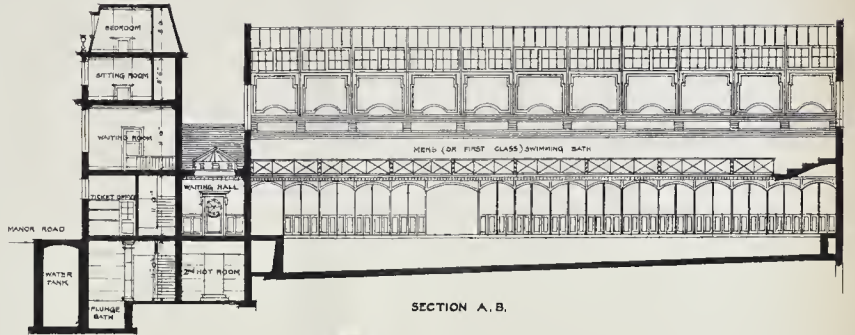


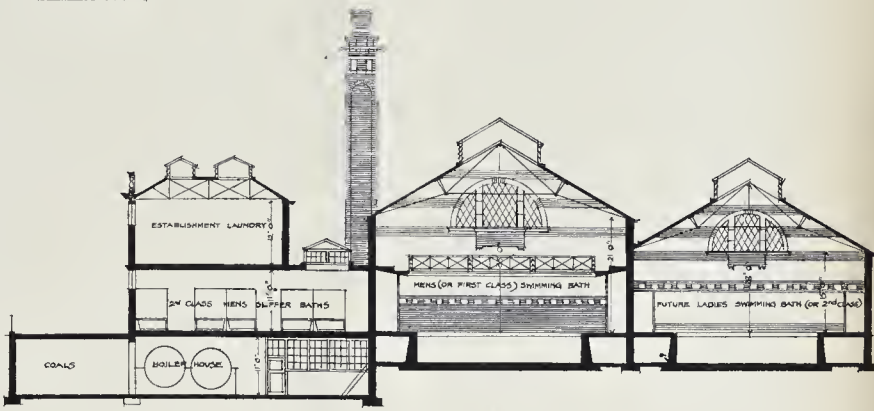
PHOTO LITHO SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



ELEVATION TO MANOR ROAD.



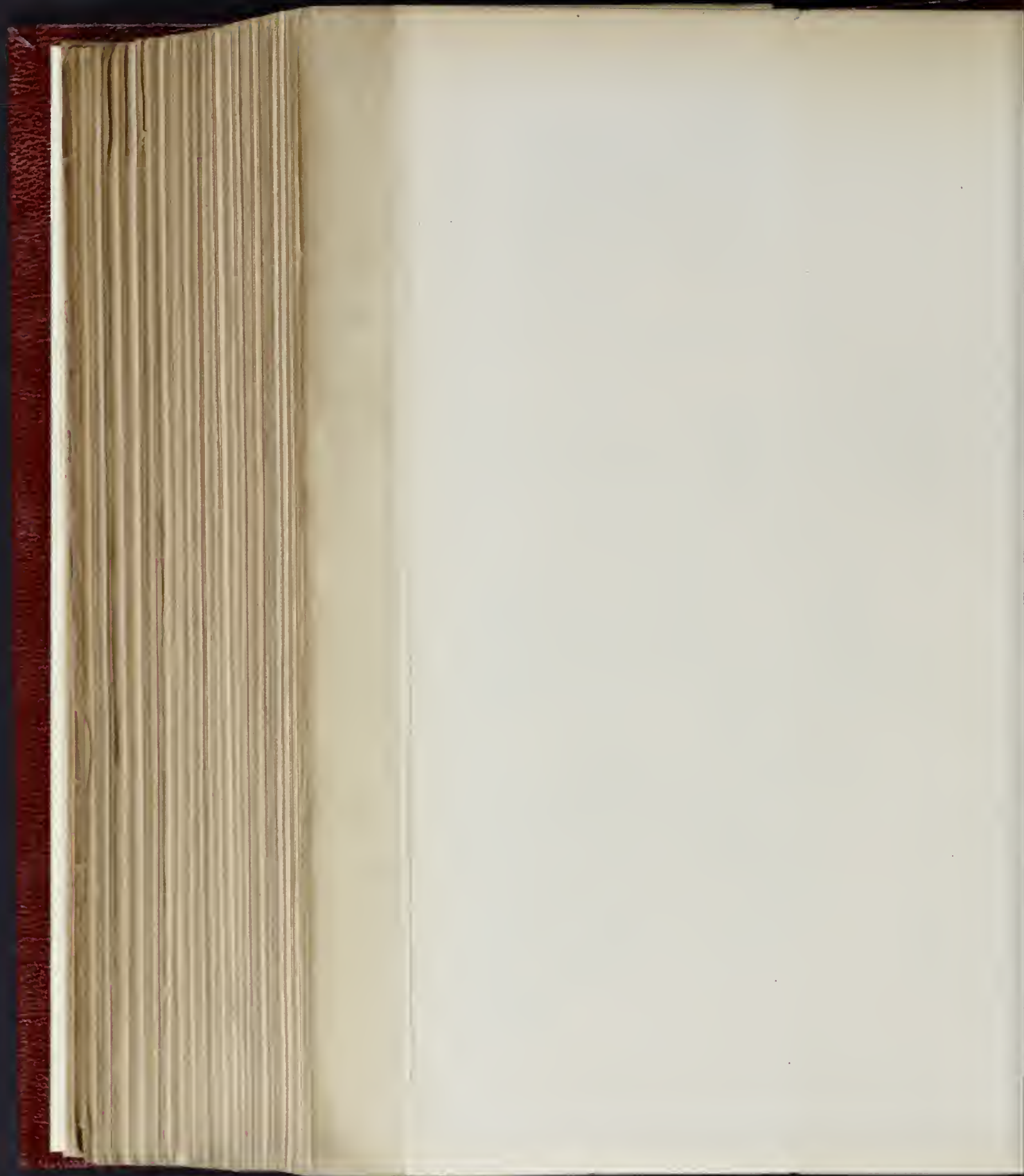
SECTION A. B.



SECTION C. D.



PHOTO LITHO SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.





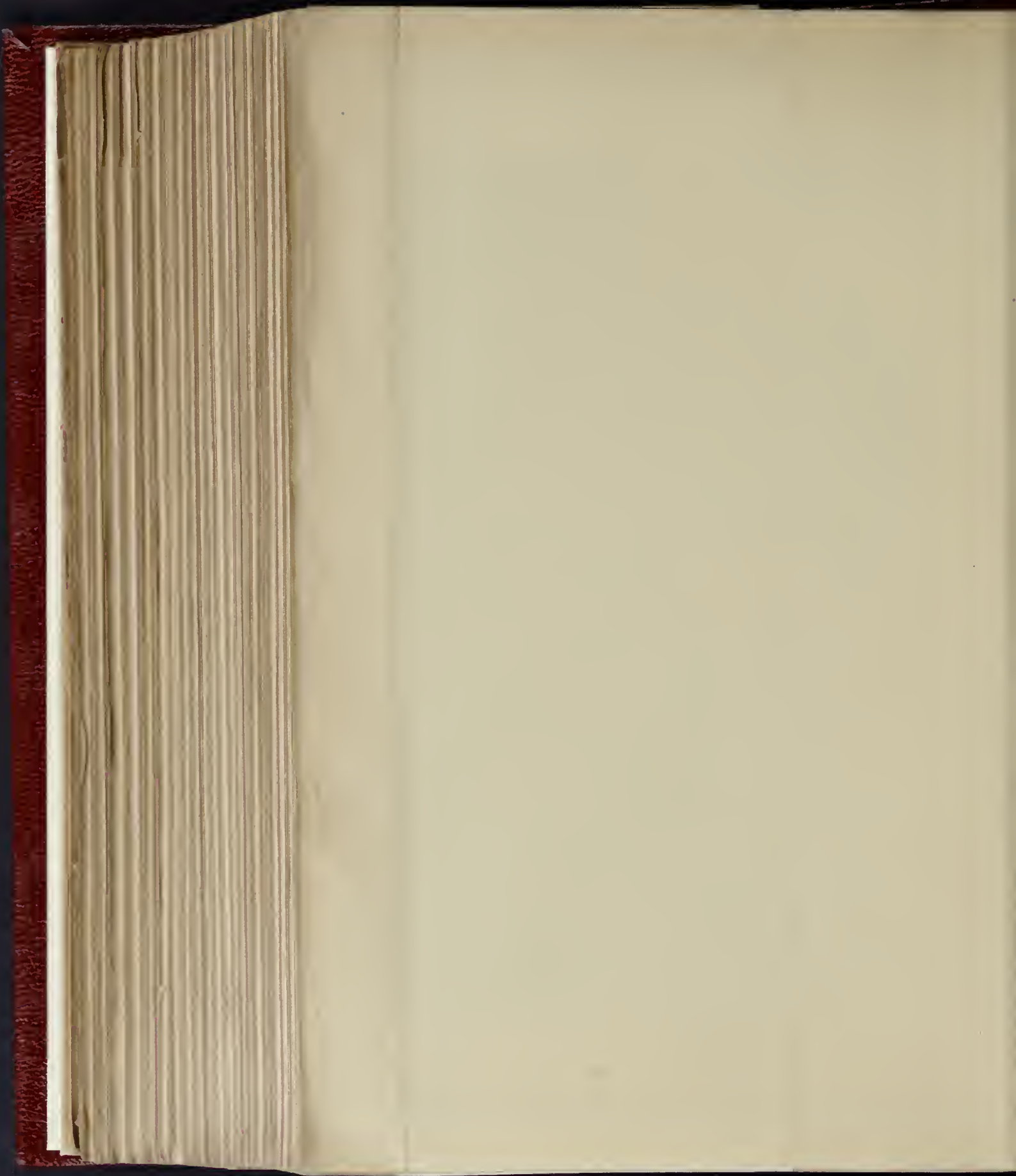
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THE MILL HOUSE, ALDEBURGH—MR. R. A. BRIGGS, F.R.I.B.A., ARCHITECT.



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THE MILL HOUSE, ALDEBURGH—MR. R. A. BRIGGS, F.R.I.B.A., ARCHITECT.



APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Islington, North.—A one-story shop upon part of the forecourt of No. 15, Highgate-hill, Islington (Mr. H. Williams).—Consent.

Islington, North.—Buildings upon part of the forecourts of Nos. 11 and 13, Highgate-hill, Islington (Mr. C. W. Calcott for Mr. J. W. Galton).—Consent.

St. Pancras, South.—A porch in front of the University College Hospital, Gower-street, St. Pancras (Mr. P. Waterhouse).—Consent.

Hammersmith.—Bay-windows at the "Lord Nelson" beerhouse, Mashro-road, Hammersmith (Messrs. N. Parr & A. E. Kates for the Royal Brewery, Brentford, Ltd.).—Consent.

Chelsea.—A projecting hood over the doorway of a building upon a site abutting upon the western side of Sloane-street and northern side of Basil-street, Chelsea (Mr. F. S. Chesterton for Mr. G. A. Cobb).—Consent.

Dulwich.—A porch in front of a detached house on the southern side of Court-lane, East Dulwich, westward of "Charwood" (Mr. H. J. Welch for Mr. E. G. Ash).—Consent.

Fulham.—Porches, with balconies over, to Nos. 42, 44, 46, and 48, Stevengrove-road, Fulham (Mr. W. Hawkins).—Consent.

Hampstead.—The retention of a pent at the entrance, and a wooden balustrade over the one-story addition, to No. 27, Platt's-lane, Hampstead, abutting upon Clarone-gardens (Mr. J. Murray).—Consent.

Holborn.—A projecting sign in front of No. 21, Tottenham Court-road, Holborn (the Brilliant Sign Company, Ltd.).—Consent.

Kensington.—A boxroom upon an existing one-story building on the east side of No. 32, Campden-grove, Kensington (Messrs. J. W. Duffield & Son for Mrs. Finney).—Consent.

Holborn.—That the application of Mr. R. Robertson for an extension of the periods within which the erection at the proposed men's lodging-house, Drury-lane, Holborn, of projecting staircases and an oriel window, was required to be commenced and completed, be granted.—Consent.

Hammersmith.—A parish hall on the south side of Great Church-lane, Hammersmith (Mr. W. D. Caroe for Rev. J. Parry).—Consent.

Hammersmith.—Buildings on the north side of Uxbridge-road to abut also upon the east side of Ormiston-road and west side of Bloomfontein-road, Hammersmith (Messrs. Palgrave & Co. for Mr. R. Le Butt).—Refused.

Hammersmith.—A building on the north side of Dunraven-street, Hammersmith, to abut upon Adelade-road (Messrs. Boyton, Sons, & Buckmaster for Mr. J. Allen).—Refused.

Paddington, North.—An iron and glass covered way to residential flats known as "South Block," Nos. 5 and 7, Maids-vale, St. Marybone (Messrs. Boehmer & Gibbs for Messrs. G. H. & A. Bywaters & Sons).—Refused.

St. Pancras, East.—A one-story addition at the rear of Nos. 60 and 62, Pratt-street, St. Pancras, to abut upon Camden-street (Mr. S. Emanuel).—Refused.

Wandsworth.—Two buildings on the eastern side of Gassiot-road to abut also upon Okera-road, and three buildings on the northern side of Church-lane to abut also upon Gassiot-road and Eswyn-road, Wandsworth (Mr. W. Bartholomew).—Refused.

Width of Way.

Hampstead.—A deviation from the plan approved for the erection of the new Hampstead hospital in Haverstock Hill, Hampstead, with the boundary fence at less than the prescribed distance from the centre of a roadway leading to the North-Western Hospital, so far as relates to the land to be dedicated to the public and the position of a portion of the western boundary of the site (Messrs. Young & Hall for the Committee of the Hospital).—Consent.

Clapham.—A billiard-room on the western side of Cranmer-court, Clapham-road, Clapham, adjoining the Clapham Assembly Rooms, with external walls at less than the prescribed distance from the centre of the roadway of Cranmer-court (Mr. A. B. Hudson).—Consent.

St. Pancras, East.—A one-story cart-shed at the rear of No. 39, St. Augustine's-road, St. Pancras, with external walls at less than the prescribed distance from the centre of the roadway of Murray-mews (Mr. E. H. Abbott).—Consent.

St. Pancras.—A one-story building at the

rear of No. 5, North-villas, Camden-square, St. Pancras, with external wall at less than the prescribed distance from the centre of the roadway of Camden-mews (Mr. W. E. Sanders for Mr. A. H. Rosevear).—Consent.

Finsbury, Central.—A warehouse on the south side of Baker's-row, Farringdon-road, Clerkenwell (Mr. E. Power for Mr. Collins).—Refused.

Lines of Frontage and Construction of Building.

Hampstead.—Retention of a wood and iron tool and cycle shed at No. 6, Briardale-gardens, Hampstead, abutting upon Clarone-gardens (Mr. R. V. Hart for Mr. L. Hardy).—Refused.

Width of Way, Line of Frontage, Projections, Space at Rear and Means of Escape at Top of High Buildings.

Holborn.—A building to be known as the Cranston "Ivanhoe" Hotel, on a site abutting upon Great Russell-street, Bloomsbury-street, Stratham-street, and Drott-street, Holborn (Mr. T. D. Rhind, for the Cranston London Waverley Hotels Company, Ltd.).—Consent; also, means of escape in case of fire proposed to be provided on the sixth (top) story of the building.—Consent.

Formation of Streets.

Lewisham.—That an order be issued to Messrs. Norfolk & Prior refusing to sanction the formation or laying out of streets for carriage traffic to lead out of the east side of Ravensbourne-park and the north side of Westdown-road, Lewisham (for Mr. A. E. Rudd).—Refused.

Space at Rear.

Strand.—A modification of the provisions of section 41 of the Act, with regard to open spaces about buildings, so far as relates to the proposed erection of an addition to the existing building on the space between No. 10, Brewer-street and Nos. 35 and 36, Bridge-lane, St. James', Westminster (Messrs. H. & H. A. Furber for the executors of W. H. Corfield & H. M. Pike).—Consent.

Means of Escape from Top of High Buildings.

City of London.—A deviation from the drawing approved, showing the means of escape in case of fire, proposed to be provided in pursuance of section 63 of the Act, on the topmost story of the premises of the Liverpool and London and Globe Insurance Company, at the corner of Lombard-street and Cornhill, City, so far as relates to an alteration in the position of one of the step ladders and of a gangway across the roof of the building (Mr. J. Macvicar Anderson).—Consent.

Dwelling-houses on Low-lying Land.

Camberwell.—That a licence be granted under section 122 of the Act to Mr. P. Blake-way for the erection of eleven dwelling-houses on low-lying land abutting on Clarendon-street, Camberwell (Messrs. E. T. Anson & Son).—Consent.

*The recommendations marked * are contrary to the views of the local authority.*

ENGINEERING SOCIETIES.

JUNIOR INSTITUTION OF ENGINEERS.—A large number of the members, accompanied by the President, Mr. W. H. Lindley, and the Chairman, Mr. Samuel Cutler, Junr., availed themselves of the opportunity for visiting recently the Central Station of the South Staffordshire Mond Gas (Power and Heating) Company at Dudley Port, and the most recent additions to the Birmingham Corporation Gas Works at Nechells. At the former they were received by the managing director (Mr. Howell), the resident engineer (Mr. Lindopp), and other gentlemen. Mr. H. A. Humphrey, the company's consulting engineer, was prevented at the last moment from being present. The station, the first as yet erected, occupies a position which is practically the industrial centre of gravity of the district, comprising 120 square miles in South Staffordshire, over which the company have powers. There are to be four units, each of eight producers, and the first unit, together with a complete set of spare towers, is now ready for working. Each producer is capable of gasifying one ton of fuel per hour throughout the day and night. The coal elevators, storage bunkers, producers, superheaters, gas mains, mechanical washers and towers, the lead acid towers for sulphate of ammonia, and the cooling towers were all examined with much interest. Steam is raised by means of climax vertical boilers arranged for burning small coal with forced draught, and also for firing by gas. Fraser and Chalmers' compressors for putting the gas under pressure

for distribution were seen in the machinery house, and two vertical Westinghouse gas engines driving various electric motors used in connection with the plant and for lighting. The pipes for conveying the gas to Wolverhampton, Walsall, and intermediate towns have been laid by Messrs. John Aird & Sons, and are mostly of the steel locking type made by Messrs. Ferguson. At the Birmingham Gas Works, on behalf of the engineer-in-chief, Mr. Henry Hack, by whom the whole plant has been designed and carried out, the members were welcomed by Mr. W. Chaney and Mr. T. R. Murray. A fine example of an inclined retort installation was seen here, the house being 324 ft. long by 114 ft. wide, with semi-circular "arch rib" roof of one span. There are four benches of retorts, each bench consisting of thirteen settings, eight retorts per setting, and all heated on the regenerative principle. The special mechanical appliance for dealing with the coke, hydraulic crane of 75 ft. radius, atmospheric and water condensers, the exhausters, washers, purifiers, and meters were shown, and the special features in their construction and operation explained. A carburetted water gas plant capable of producing over 6 million cubic feet of gas per day was also seen, consisting of generators, carburetors, superheaters, condensers, washers, blowers, purifiers, &c. In connexion with this plant are four oil-storage tanks of steel of 60 ft. diameter, 25 ft. high, and 1,760,000 gallons total capacity. The whole of the manufacturing and purifying plant at Nechells is now in course of duplication and well advanced, and will, when finished, complete the scheme of works as originally designed—viz., for 10 million cubic feet of gas per day, excluding water gas.

COMPETITIONS.

SCHOOL, CHESTERGATE, STOCKPORT.—The designs of Messrs. Cheers & Smith, architects, Blackburn, have been selected for a new public elementary school to be erected at Chestergate, Stockport. The school provides accommodation for 950 children—viz., 300 infants, 250 mixed juniors, and 400 mixed seniors. A large swimming bath and cokeroy and manual instruction rooms form features of the building.

BOOKS RECEIVED.

THE LAW RELATING TO SEWERS AND DRAINS. By Alexander Macmorran, K.C., and W. Addington Wills, Barrister-at-law. (Butterworth & Co., and Shaw & Sons.)

THE PROGRESS OF THE GERMAN WORKING CLASSES. By W. J. Ashley. (Longmans, Green, & Co. 1s. 6d.)

FIRST STAGE BUILDING CONSTRUCTION. By Brysson Cunningham, B.E. Second Edition; revised. (W. B. Clive.)

SKETCHES ON THE OLD ROAD THROUGH FRANCE TO FLORENCE. By H. Hallam Murray, H. W. Nevison, and M. Carmichael. (John Murray, 21s.)

HAMPSTEAD WELLS: A SHORT HISTORY OF THEIR USE AND DECLINE. By G. W. Potter. (Geo. Bell & Sons.)

Correspondence.

"ARCHITECTS' DRAWINGS."

SIR,—We are delighted to see your leading article in the current issue of the *Builder*, and we hope that the conclusion to which you have arrived will meet with the general support of the profession.

In the particular action referred to there may or may not be a good defence as the law now stands; but in any case, as the action is to be carried further it seems to us that, in the interests of the profession, every effort should be made to uphold the well recognised custom that, except in special cases, the drawings are the personal property of the architect. In order to assist the defence we are willing to contribute ten guineas each, provided that not less than eight other architects are willing to come forward with contributions of a like amount, so as to insure 100 guineas at least toward the costs of defence.

GEORGE HERBARD, F.S.A., F.R.I.B.A.
ALFRED W. S. CROSS, F.R.I.B.A.

SIR,—Whether due to comparative poverty or to want of backbone, architects, as a class, have for a long time constituted a species of "Aunt Sally" for the benefit of the legal

profession; but, if the decision in the case of *Gibbon v. Pease* be not reversed on appeal, the future position of architects promises to be well-nigh contemptible—to be, in fact, merely that of “plan makers in ordinary” to their clients, to enable the latter, as untrained amateur builders, to comply with the requirements of building authorities, and, at the least possible expense to themselves, to obtain the services of a trained architect to assist them to carry out, without personal risk, their ideas of “architecture.”

Your able leading article in the last issue of the *Builder* so exactly and completely summarises the position that further words seem unnecessary; the one thing now needed being action upon the part of architects as a body. Such action must also be prompt and strongly supported if full advantage is to be taken of the fortuitous circumstance of a clear case upon which the issue may be explicitly stated and fought out. Surely it is in the interest of every architect to see that his position as a highly-trained adviser—and not a mere tool of his client—is explicitly stated and conceded. Consequently, whether or not the defendant in the case of *Gibbon v. Pease* or the “Board of Professional Defence” is or is not financially able to contest the point, the foginess would more likely be cleared away from the eyes of the legal profession as to what an architect really is, if the matter received the support of the entire body of architects.

You, sir, have rendered signal service to architects by your most clear and instructive remarks. Will you add one more favour by opening a fund, through your columns, to enable the question to be taken to the Court of Appeal—and to the House of Lords if necessary—on behalf of architects as a body instead of one member thereof?

I have not the pleasure of Mr. Pease's acquaintance, and, therefore, my letter can be accepted as written with entire singleness of purpose.

I enclose a cheque for 5*l.* 5*s.* in case you are willing to open such a fund; but for the present I should prefer that my name should appear as “A PROVINCIAL ARCHITECT.”

*** We shall be quite prepared to take the action proposed by our correspondent should it become necessary. For the present, however, we have handed him back his cheque, with the intimation that we preferred to wait and see whether the Institute of Architects may yet be persuaded to recognise what we regard as its duty to the Profession.—Ed.

SIR,—We, as solicitors for the defendant in *Gibbon v. Pease*, have read with the greatest interest your leading article in last week's copy of the *Builder*, on the question which was raised by that case, and we ought to say that your remarks as to the desirability of the R.I.B.A. taking the matter up, entirely accord with our own views of the subject.

Unfortunately, however, they do not appear to accord with those of the Royal Institute Council, as will be seen from the enclosed letter, which was sent to all members of the Council of the Royal Institute, and in reply to which we received a letter from its Vice-President, a copy of which we enclose for your perusal.

As matters now stand an appeal is, of course, a great expense, and while the Surveyors' Institution has subscribed 100*l.* towards the expense of the trial, so far as it involved the delivery up of documents appertaining to their branch of the profession, the Royal Institute as a body has offered no assistance, pecuniary or otherwise, although several members of the Council have been markedly different in this respect; and, we are given to understand, did their best for us at the Council Meeting, before which the enclosed letter was laid.

You will also observe that our Mr. Daphne never had the opportunity which he has repeatedly asked for, to lay the matter before the Council of the Institute, and as a matter of fact (unless the enclosed letter from the Vice-President is to be taken as such) we have had no report from the Council at all as to what took place at the meeting before which our letter was laid. This being so, and inasmuch as our client, Mr. Pease, is by no means a man of wealth, and the point involved affects every architect in the United Kingdom and Ireland, we feel it is right that our letter to the Council of the R.I.B.A. should be laid as it stands before architects generally, through the medium of your columns, in order that they may, at any rate, have the opportunity

of helping Mr. Pease to enforce the rights of the profession to which he has the honour to belong, and the burden of which ought clearly not to fall upon one man alone.

CHAS. ROBINSON & Co.

10, Norfolk-street, Strand, November 28.

*** The following is the letter addressed by Messrs. Robinson & Co. to the Members of the Council of the Institute of Architects. If we understand correctly, Messrs. Robinson had already addressed the Council formally on the subject, and had received no official reply and no intimation that their letter had even been considered by the Council; they therefore addressed the following circular to Members of the Council individually:—

“10, Norfolk-street, Strand, W.C.
November 17, 1904.

GIBBON V. PEASE.

DEAR SIR,—As you are no doubt already aware from the correspondence which, we are given to understand by your Secretary, has been laid before your Council, we are acting on behalf of Mr. C. E. Pease, who has been sued by the plaintiff, Mr. Gibbon, for the detinue of a number of documents, a list of which is *inter alia* as follows:—

All plans, drawings, and specifications prepared by the defendant for the purpose of the alterations and works carried out under his supervision, and in particular the drawings Nos. 1 to 5, and the specifications marked A, and the copies of the drawings returned by the contractors to the defendant referred to in the contract dated 21st October, 1902, and copies thereof, all estimates and tenders, etc., and copies thereof, all contracts made by plaintiff or defendant on his behalf, and copies thereof, all bills of quantities and copies thereof, all letters and copies of letters in connection with or relating to the buildings, plans, specifications or contracts, or any of them and all other plans, specifications, papers and writings, including copies thereof relating to the said alterations and works, or any of them.

We feel that, in the interests of the profession at large, the detailed circumstances should be laid before your Institute with a view to obtaining financial assistance for Mr. Pease in appealing from the decision given on the 15th inst. by Mr. Justice Ridley.

The facts of the case are as follows:—
Mr. Pease was acting both as architect and as quantity surveyor in the alteration of certain premises in Queen's-road, Bayswater, which the plaintiff desired converted into flats.

It was to act as architect on plans which he had previously prepared as a commission of 5 per cent. on the accepted tender, provided that the accepted tender was for less than the sum fixed by the building owner. He was also employed as quantity surveyor at the usual charge of 2½ per cent. The plaintiff, on completion of the work, demanded from Mr. Pease the whole of the documents referred to above (which, it will be noticed, were both those which would come into his possession as architect and also as quantity surveyor) and we should perhaps here mention that the Surveyors' Institution guaranteed up to 100*l.* Mr. Pease's costs of defending the action so far as such part of it as related to quantities was concerned, and called a meeting of their Council and sent a deputation of them to prove the custom of the quantity surveyor's profession at the trial.

What happened at the trial yesterday was this:—

The plaintiff feeling, no doubt, his position as claiming the dimensions, abstracts, and draft bills of quantities, was hopeless, gave up his claim as regards these, and he also gave up his claim to all the other documents above mentioned with the exception of the contract drawings and the specifications.

As regards the contract drawings and specifications, the judge refused to hear the expert evidence we had at hand as to custom, ruling that this contract was governed by the case of *Ebdy v. McGowan*, with which case you are, no doubt, familiar, and he accordingly gave judgment for the plaintiff in respect of the contract drawings and specifications. He, however, gave the defendant his costs of the issue regarding the papers prepared by the defendant in his capacity of quantity surveyor, and he gave leave to appeal the question as to the contract drawings and specifications, and stayed execution for three weeks, or if appeal entered within that time, then until the trial of the action.

The question of the appeal thus becomes a matter of vital importance to the profession as a whole, as, while this decision stands, an architect, working on the usual 5 per cent. commission for superintending building work to completion, will be forced to deliver up all his plans to the employer after he has completed the job.

We are advised that this species of contract which was the contract in this case is clearly

distinguishable from that in *Ebdy v. McGowan* and we are quite clear, as a matter of fact, that text-books quoting *Ebdy v. McGowan* have relied on the judgment in that case as reported, without looking at the facts upon which the judgment in question was based and that the judgment itself was in terms limited to the facts of this particular case.

What happened in *Ebdy v. McGowan* shortly as follows:—

A vicarage was to be built by the architect of the following express terms:—5 per cent. if the vicarage was completed, 3 per cent. if tenders obtained and work not commenced, 2½ per cent. if no tenders issued.

The building owner decided not to build at all, and consequently the 2½ per cent arrangement applied, that is to say, the contract resolved itself into a special contract to buy plans at 2½ per cent. The contract was not, as we may term it, an unseverable one (as the case is), as the building owner had the option to build or not to build, and further the terms of the arrangement implied a special contract as to what was to be done if the plans were drawn and no tenders issued.

The architect accordingly sent in a demand for his 2½ per cent. commission for the preparation of the plans, but in subsequent correspondence he refused to deliver up the plans themselves even were he paid, and the building owner refused to pay unless he had the plans delivered up.

In the Court of first instance the architect succeeded in proving a custom that he had a right to keep the plans, although he was paid for them, and what the Court sitting in Bank decided on appeal was, that such custom, even if proved, would be unreasonable, which seems perfectly natural and proper, as otherwise the building owner would not be getting what he actually bargained for, i.e., the plans.

The distinctions between our case and that, among others, are as follows:—

In our case plans were prepared before, a matter of fact, any contract was made between the plaintiff and defendant at all, and were only accepted on the basis of the tender coming in under 3,500*l.* That is to say, our contract was, “if you can get the building done on the plans you have shown me for 3,500*l.*, or under, I will give you 5 per cent. on the accepted tender.” Mr. Pease could have claimed nothing whatever for his preparation of the plans had they not been

(1) Approved by Mr. Gibbon after having been drawn, and

(2) An estimate having come in at less than the given price, and

(3) The building having been completed in accordance with the plans; or, in other words, that our contract was not a contract to prepare plans at all, but to carry out alterations, and we say that the plans were merely prepared by us for our convenience in carrying out the work, and no obligation existed to prepare plans at all, and we should particularly point out that had the plaintiff refused to complete the work we could have claimed nothing whatever for the work involved in the preparation of the plans, but must have sued for the whole of the amount due under the contract, and recovered either that or nothing at all.

The position we take up is as follows:—

Where the retainer of an architect and his employment is to superintend work, and the preparation of plans is merely ancillary to the supervision of the work, or where the architect is instructed in the first instance to prepare plans, and afterwards to superintend the carrying out of the work thereunder, the architect keeps the plans, not only by custom but because on completion of the work the building owner has all he bargains for.

Where the employment of the architect is confined to the preparation of plans without reference to the carrying out of any work then the employer, by special contract, keeps the plans, but there is no recognised custom as to the employment of an architect for the latter purpose (the architect's duty being primarily to superintend the building of premises, and not to prepare plans), and therefore, in every case where the employer keeps the plans, he keeps them in pursuance of a special contract.

Now, if this contention be correct there should be no distinction between the employment of an architect and that of a quantity surveyor, as laid down in the case of the School Board for London v. Northcroft, as regards delivery up of materials prepared for the carrying out of his contract.

This case was an action in which the School Board sought to recover from Mr. Northcroft, a quantity surveyor, certain bill of quantities, dimensions, and abstracts made by the defendant, and relating to certain

property belonging to the London School Board; and which action the School Board lost, although, as a matter of fact, an error of no less than 677 cubic yds. was made by the quantity surveyor, and the School Board required dimensions, abstracts, etc., for the purposes of checking these off. The judge, Mr. Justice A. L. Smith, in his judgment, made the following remarks:—

"The defendants deny that the plaintiffs are to have the documents in question, as they allege such documents were prepared by them solely for the purpose of making up their bills of quantities for the contractors. An action of detinue will not lie, for how can the defendant's private memoranda be the property of the plaintiffs; the ink, papers, and brains used in making them are all the defendant's, and they are right in law in refusing to give them up."

Now the ultimate object of the quantity surveyor, and the purpose for which he is employed, is to make and deliver to the building owner a bill of quantities, and all the machinery whereby he arrives at that result are held to be his own property.

The ultimate object of an architect is to supervise the construction of, and deliver to a building owner, a completed house, and the materials whereby he arrives at that result, *etc.*, his plans, specifications, and correspondence, etc., should, we think, be held to be his property also, by analogy with the above case.

Quite apart from this we ought to call your attention to the fact that the Court of Appeal is at liberty to over-rule *Ebdy v. McGowan* altogether, as *Ebdy v. McGowan* was decided by the Court in Bank merely, or they could say that in *Ebdy v. McGowan* there was, on the facts, a special contract, whereas, in our case there was not, and send the case back to the Court of King's Bench for trial as to the existence of a custom.

It is, of course, difficult to place the whole of the circumstances before you in a letter, and our Mr. Daphne would be pleased to attend before your Council, as he has already offered to do, and put the matter before you in detail, which we should be very much obliged if you would give him the opportunity of doing, as there are many arguments in favour of the architect, which, if included in this letter, would make it altogether too lengthy for convenient digestion.

For convenience of reference the following is a list of the correspondence between Mr. Pease and ourselves, and Mr. Locke, and we shall be glad if you will see that it is all laid before your Council at their next meeting:—

Letters, Mr. C. E. Pease to your Secretary, January 9, 1904, August 4, 1904, September 7, 1904, October 20, 1904.

Letters, C. Robinson & Co. to your Secretary, January 12, 1904, January 14, 1904, February 15, 1904, and enclosures.

Letters, your Secretary to Mr. C. E. Pease, January 11, 1904, August 10, 1904, September 8, 1904, October 15, 1904, October 21, 1904.

Letters, your Secretary to C. Robinson & Co., January 13, 1904, January 15, 1904, February 19, 1904, March 1, 1904.

Yours faithfully,
CHAS. ROBINSON & CO.
To a Member of the Council of the Royal Institute of British Architects."

FIRE-RESISTING FLOORS.

SIR.—In your advertisement columns of last week, my name, honorary function, and part of a sentence from some writings of mine regarding the Baltimore fire, are utilised by Messrs. Mark Fawcett & Co. in a manner that would make it appear that I endorsed the system of floor construction with which that firm is specially associated.

The extract is quite correct as far as it goes, but it should be read in conjunction with my observations on the Baltimore fire generally, for, if standing alone, and appearing below an illustration of Messrs. Mark Fawcett & Co.'s floor, a very different impression is obtained from what I intended to convey in my remarks on that conflagration.
EDWIN O. SACHS.

THE JOINERY TRADE.

SIR.—"J. C. W." says he can make joiner's work in "England" quite as cheaply as the foreign joinery. This is not the experience of the majority of people, or "Laxton" would not put the price of foreign-made doors, sashes, and frames at such a much lower figure than the English make.

I beg to say I have a well-equipped joiner's shop, with modern machinery, and have often tried, but without success, to make doors, window sashes, and frames at less cost than the foreign make, and of which we see such large quantities brought into and sold in

London, and used in the various building estates now being developed in the suburbs of London.

My first trouble is the prohibitive local rates; and, as every manufacturer knows, machinery is assessed "right up to the hilt"; this presses very heavily.

Then we have the Factory Act, with the inspector's requirements as to fire-escape ladders, staircases, sanitary arrangements, etc., all of which cost a great deal of money.

Of course, the rates of the London joiner's wages—namely, 10d. per hour—is much higher than that of the foreigner, and also of many of our own provincial towns, who pay 8d., and some less.

But in the case of the foreigner, he pays none of our rates or Imperial taxes, and he does not come under our Factory Act, therefore, the remedy I would suggest is, that some toll or tax be put on all foreign-made joinery, as an equalisation for the rates and taxes paid by us, and which would enable English employers to employ English joiners.

A LONDON BUILDER.

COURT OF COMMON COUNCIL.

THE usual fortnightly Court of Common Council was held at the Guildhall on Thursday last week.

Artizans' Dwellings, Houndsditch.—The Improvements and Finance Committee reported that certain repairs, painting, pointing, etc., were necessary at the artizans' dwellings in Stoney-lane, Houndsditch. It was agreed that the works, estimated to cost some 2,000*l.*, should be included in next year's estimates.

Street Improvements.—On the recommendation of the Streets Committee it was agreed to carry out various minor street improvements. It was also agreed to withdraw the stipulation as to the working at night only in the case of certain street works in Wormwood-street, London Wall, and Basinghall-street, in connexion with the General Post Office. An officer of the Metropolitan Drinking Fountain and Cattle Trough Association to provide an ornament at drinking fountain, to be fixed round the base of the lamp column over the underground convenience at St. Martin's-le-Grand, was accepted. It was ordered that an expenditure of 85*g.*, 10*s.* should be incurred in the substitution of incandescent gas burners for the old lamps, and the provision of 115 additional lamps in various side streets and courts in the City. Permission was granted to the City and South London Railway Company to fix a clock outside their Bank Station at the corner of Lombard-street and King William-street.

Hairdressers' Saloons: Regulations.—The Sanitary Committee submitted a report from the Medical Officer of Health on the conduct of hairdressers' saloons. Regulations drawn up by that officer were approved. The same Committee submitted the revised by-laws with respect to houses let in lodgings, and these also were adopted and received the City Seal.

London Squares and Enclosures Bill.—A letter from the Clerk to the London County Council transmitting a copy of the first draft clauses of this Bill was referred to three Committees—The City Lands, Streets, and Bridge House Estates Committee.

Cattle Market, Deptford: Lighting.—On the recommendation of the Cattle Markets Committee, it was agreed to renew the contract with the Kitson Lighting Company of Great Britain, Ltd. (now merged in The United Kingdom Lighting Trust, Ltd.), for leasing installation of oil incandescent lamps for the roadways and open areas of the Foreign Cattle Market, Deptford, for one year, at the reduced cost of 600*l.*

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METROPOLITAN ASYLUMS BOARD.

THE fortnightly meeting of the Managers of the Metropolitan Asylums District was held at the offices of the Board, Victoria Embankment, W.C. on Saturday last, Mr. Scovell presiding.

Joyce-green Hospital: Internal Painting.—Among the correspondence received was a letter from the Local Government Board asking to be furnished with more definite information relating to the proposed internal painting work at the Joyce-green Hospital, and why so large an expenditure of 7,000*l.* is necessary at this stage. It was agreed to inform the Local Government Board that the estimate was for the whole of the interior painting, and that the amount was not considered excessive.

North-Eastern and North-Western Hospitals.—A letter was received from the Local Government Board authorising the erection of cottages at these hospitals for the accommodation of the engineers at a cost of 1,120*l.*

Rochester House Asylum.—The Asylums Committee recommended, and it was agreed, that unconditional consent be given to a proposed rearrangement of the boundary line between the Rochester House estate and the property of the Ealing Borough Council. The Managers are terminating their tenancy of Rochester House at Midsummer next.

The Downs School.—The Children's Committee reported having decided on carrying out certain improvements to the fire-extinguishing appliances at this school at a cost of 110*l.* The ten outside hydrants will be replaced by modern hydrants with outlets to suit the hose couplings used by the local fire brigade.

Park Hospital.—It was referred to the Works Committee to take the necessary steps for the erection of six permanent stagings in the casing of the well at the Park Hospital.

Belmont Asylum.—The Works Committee reported that since the last meeting of the Board they had sanctioned certain further variations on Messrs. Enness Brothers' contract, amounting in value to 13*g.*, 10*s.* Mr. W. Crooks, M.P., asked the Chairman of the Works Committee if he could give him any information with regard to a letter from Messrs. Enness's on the question of the rates of wages paid to the workmen at this asylum. It appeared that part of the asylum was outside the twelve-mile radius from Charing Cross, and the contractors had "measured the milestones" which he considered was mean. Mr. Helby, in reply, said that Messrs. Enness Brothers had decided to take no further action in the matter, but it had been agreed by the Committee that, in all future contracts, the whole of the asylum should be included in the twelve-mile area.

North-Western Hospital.—The Engineer-in-Chief reported the completion of the fire-resisting works at this hospital. The works were carried out by Mr. W. Harbrow at a cost of 2,33*g.*, 16*s.*, being 6*l.*, 16*s.* in excess of the contract sum.

Minor Works and Repairs, Mode of Carrying Out.—On the recommendation of the Works Committee it was agreed:—"That in the event of a committee deciding that any work or repair (the value of which is estimated not to exceed 100*l.*) is necessary and should be dealt with by the Works Committee, it shall be the duty of the Works Committee to determine in what manner and to what extent such work or repair shall be carried out."

South-Eastern Hospital.—The Works Committee further reported that they had authorised the provision of 300 Gilmour (Canadian) hospital doors in the eight pavilions, two isolation blocks, and the receiving and discharge wards, at an extra cost of about 240*l.*, in place of the internal doors originally specified for those buildings.

OBITUARY.

MR. HENRY S. WHALLEY.—We have to announce the death, which took place on the 25th ult., of Mr. Henry S. Whalley, F.S.I., 5, Hunter-street, Chester. Deceased was a son of the late Mr. Jno. Whalley, surveyor and land valuer, to whose business he succeeded. He was frequently employed as an expert in arbitration cases, land disputes, and in connexion with the promotion of railway and other Bills in Parliament.

GENERAL BUILDING NEWS.

CHURCH, CLYDACH.—At Clydach-on-Tawe, Swansea Valley, on Thursday last week, the memorial-stone was laid of the new Church of St. Mary. The church is situate on the corner of the main road. The plan consists of a nave, 69 ft. long by 28 ft. 6 in. wide; north aisle, 65 ft. long by 12 ft. wide. The south aisle, terminating in a west tower, 18 ft. square, is 43 ft. long by 12 ft. wide. The chancel is 36 ft. long by 22 ft. wide, with an organ chamber and choir vestry on the south side and clergy vestry on the north side. The length of church inside, from the west wall of nave to east wall of the chancel, is 105 ft. An arch, rising to a height of 34 ft. to the apex, divides the nave from the chancel, and the roof of the chancel is barrel shaped, divided into panels by moulded ribs. There is to be a scullia in the chancel, the work of Mr. Clarke, sculptor, of Llandaff, in whose studio the rest of the carved work will be done. The main entrance to the church is from the south side of the tower, and the tower will rise to a height of 100 ft. to the turret. A chiming clock, with illuminated faces on three sides of the tower, will be placed in it at a height of 65 ft. from the road level. The arches to nave arcades are carried on columns, alternately circular and octagonal on plan, with bands of red

Forest of Dean stone. The arcades are surmounted by three-light traceried windows, with arches carried on small columns. The nave roof is open to the apex, and is 49 ft. high. The principals spring from circular shafts with moulded-caps and bases. All the timbers are of pitch-pine, and will be left clean from the plane. The chancel is lighted with a five-light traceried window in two orders of mouldings. The west window is a three-light window, flanked by a single light on each side. The aisle windows are two-light, each having different tracery in the heads. The church will be seated with benches throughout for 500 adults, and the choir stalls executed in Austrian oak. The chancel steps are to be of white Sicilian marble, and the pavement of chancel and passages of black-and-white marble in large squares. The system of heating adopted is Grundy's warm air apparatus. The walls are being built with grey native stone, with box ground stone dressings, and the roofs are to be covered with green Tych slates. The church, when completed, will cost 10,000. The contractors are Messrs. Bennett Brothers, of Swansea. Mr. Bruce Vaughan, of Cardiff, is the architect.

CHURCH RESTORATION, NEWTON ABBOT.—Wolborough Church, Newton Abbot, was reopened by the Bishop of Exeter on the 17th ult. after the restoration of the roof by the feeoffees. The whole of the old slating, plaster ceiling, and roof timbers have been removed, and an oak roof substituted. The principal trusses, purlins, and horizontal and vertical ribs are moulded with carved oak bosses at the intersections, and the former plaster barrelled ceiling has been replaced by a ceiling of oak battens in narrow widths. The wall plates in the nave and aisles are of moulded oak, but in the chancel they are carved in addition. The central bosses in the chancel roof are carved, representing the emblems of the Passion. The rafters of the roofs are also of oak, boarded on the outer face with red deal boarding, which is covered with felt, on which battens are laid, while the outer covering is of slate with plain ridge tiles. An alteration has been made in the form of the gables at the western ends of the aisles. hitherto joined squarely to the tower. The inner sides of the gables now correspond with the outer sides, with Bath stone copings, and a Bath stone cross and base fixed on the apex of each, to correspond with the gables at the ends of the chancel and south aisle. A similar cross has also been fixed on the apex of the gable at the eastern end of the north aisle. The interior of the walls has been cleaned down and coloured a light stone colour, and the Beer stone columns between the nave and aisles and the stonework of the windows have also been cleaned down, while the seats have been cleaned off and varnished. The ventilation of the church has been improved, ventilators being provided in the cells of the windows for the admission of fresh air, while the foul air is extracted by means of adjustable exhaust under-roof ventilators. The work, which has cost about 1,300, has been carried out from the designs of Messrs. Powell, Sons, & Locke, architects, of Newton Abbot.

CHURCH RESTORATION, CLAUGHTON, LAN-CASHIRE.—The Church of St. Chad, at Cloughton, which has recently been enlarged and repaired, was reopened on the 9th ult. by the Bishop of Manchester. The work was commenced six months ago, and the interior has been entirely renovated from designs by Messrs. Austin & Paley, architects, of Lancashire. The total cost is 900.

CHURCH FOR SEAMEN AT THE VICTORIA DOCKS.—On the 9th inst. the Bishop of St. Albans will dedicate the new church of the Missions to Seamen at the Victoria Docks. The building has been designed by the Rev. Edmund Sinker, and the work has been carried out by Mr. Edward Beasley, builder.

ROMAN CATHOLIC CHURCH, SHEFFIELD.—The foundation-stone of a new Roman Catholic church was laid recently on a site just below Banner Cross, on Ecclesall-road. St. William's, as the new church will be called, will accommodate 100 worshippers, and will be of brick, with stone facings. Mr. C. M. Hadfield is the architect.

WESLEYAN METHODIST CHURCH, HANWELL.—The opening of the new Wesleyan church at Hanwell took place a short time ago. The building stands on a site about 450 ft. deep by 90 ft. wide, and has been erected at a total cost of 8,400. Accommodation has been provided for 600 persons on the ground floor, while the transepts will be used for school purposes, and will seat 500 scholars. Messrs. Gordon & Gunton were the architects, the contractor being Mr. Charles Brightman, of Walford.

RENOVATION OF WESLEYAN CHAPEL, CRAN-MOOR.—The improvements to this chapel have

now been completed, and the building was reopened on the 26th ult. The walls have been partly rebuilt, and the interior has been re-seated; a new entrance has been made, a new roof has been put on, and a new floor laid, the entire work being carried out according to plans prepared by Mr. R. M. Loxley, of Sheffield.

CONGREGATIONAL SCHOOLROOM, LEDBURY.—A new schoolroom was recently opened at Ledbury in connexion with the Congregational church in that town. The building is connected with the chapel by a short corridor. It is built of corrugated iron, lined with match-board, which is stained and varnished, and will seat 200, being 40 ft. by 20 ft. The windows have Gothic heads and the glass is fluted. Gas pendants hung from the roof provide the artificial lighting. The seats have reversible backs, and there is a portable platform. The frame of the building has been so constructed that it can be taken down and re-erected elsewhere. The exterior in Church-street is fenced with dwarf walls, surmounted by wrought-iron railings. The architect was Mr. G. Stephens, of Ledbury, the contractors being Messrs. F. Smith & Co., of Stratford, London, E.

DAIRY PREMISES, ABERDEEN.—A new dairy has been opened in Whitehall-road, Aberdeen. At the front of the buildings a sale shop, the walls of which are lined with white tiles, has been fitted up. Stables, sheds, etc., have also been erected in connexion with the establishment. The whole building is heated with steam radiators. The architects were Messrs. Walker & Duncan, Aberdeen.

PRESBYTERIAN HALL, NEWCASTLE.—In connexion with St. George's Presbyterian Church, in this city, the foundation-stone was laid, on the 15th ult., of a new hall in Jesmond-road. The building will seat 450, and the total cost will be about 2,500. Mr. R. Burns Dick was the architect, and Mr. S. F. Davidson was the contractor for the work.

EXTENSION OF BUSINESS PREMISES, ABERDEEN.—The premises of Mr. J. W. Reid, in Crown-street, Aberdeen, have recently been enlarged and improved. The work has been carried out from the plans of Mr. R. G. Wilson, architect, by the following contractors:—Mason work, Mr. David Weir; carpenter, Messrs. R. & J. Reid; plumber, Mr. J. Campbell; plasterer, Messrs. J. Buccochie & Sons; slater, Messrs. J. & A. Milne; painter, Mr. E. Copland; lift, Messrs. Claude Hamilton, Ltd.; and electric lighting, Messrs. Blaikie & Sons.

DALZIEL NEW POORHOUSE.—The hospital and receiving blocks of the Dalziel new poorhouse at Motherwell were opened a short time since. The buildings have been erected by the Dalziel Parish Council at a cost of about 14,000, and they are situated on a site at Airbles, overlooking the Clyde. The architect is Mr. Alexander Cullen, Motherwell.

NEW PARISH ROOM, ST. ETHELRED, NORWICH.—A new parish room for the parishes of St. Ethelred and St. Peter, Southgate, Norwich, was opened recently by the Lord Bishop of the Diocese. The room stands upon the site of the ancient Hildebrond's Hospital; it was afterwards occupied by what was known as Ivy Hall; and, lastly, the site was encumbered by a number of old cottages. The building is of red brick, with green slate roof. The interior apartment, 55 ft. long by 21 ft. in width, is lighted by side and end windows, and the roof is of polished pitch-pine. The floor is boarded. The architect was Mr. C. Clowes, and the builder Mr. G. Greengrass.

BRADFORD TOWN HALL EXTENSION.—The Town Hall Extension Committee have decided to put in hand at once the work of excavation for the extension of the Bradford Town Hall. The working drawings are at present in the hands of the quantity surveyors, and it is expected that in about five weeks the contracts for the whole work may be considered. It has been decided that the Plenum system of ventilation shall be adopted for the new addition to the town hall.

DALZIEL HALL, ELGIN.—New headquarters are to be erected for the 3rd V.B. Seaforth Highlanders, at Elgin. Mr. W. C. Reid, Elgin, is the architect. The new headquarters will consist of an orderly-room and offices, sergeant-major's quarters, drill hall, gymnasium, armouries, stores, etc. The probable cost will be about 3,200.

NEW HALL, ARMAGH.—The new hall of the Irish National Foresters, at Armagh, was recently opened. The building has been erected from the plans of Mr. J. M. Dermott.

PROVIDENCE INSTITUTE, PENARTH.—A new church institute is to be erected on a site in Albert-place, Penarth. Plans have been prepared by Mr. H. Snell, architect, and the cost is estimated at about 3,000.

MEMORIAL HALL, PLYMOUTH.—The Pitts Memorial Hall, in Gibbon-street, Plymouth, was opened on the 23rd ult. Mr. Alton Bazeley, architect, designed the building.

APPOINTMENTS.

PATENT OFFICE, CALCUTTA.—Mr. Henry George Graves has just quitted H.M.'s Patent Office, where he was an examiner of patents for mining and metallurgy, to take up the appointment of Comptroller of the Patent Office in Calcutta. Mr. Graves received his training in the Royal College of Science and the Royal School of Mines, 1881-5, where he gained the De la Beche medal for mining, and an Associateship in mining and metallurgy. As a member of the Iron and Steel Institute he, for some years past, compiled technical abstracts and papers for the journal of that Institute, and took a leading part in the conduct of their annual meetings.

MISCELLANEOUS.

MUNICIPAL COUNCILS AND ARCHITECTURAL WORKS.—Committees of a number of the Metropolitan Borough Councils have now under consideration a letter from the Secretary to the Royal Institute of British Architects enclosing copy of a memorial from that and other architectural bodies urging:—(a) That architectural work be not placed in the hands of engineers or surveyors; (b) that where it is deemed desirable for architectural work to be carried out by a county or municipal official, such official shall be required to have passed the qualifying examinations of the Royal Institute of British Architects; and (c) that the work of an official architect be restricted to structures of secondary importance, and that all buildings of a monumental character be entrusted to independent architects to be selected in such a way as may seem best to the local authority. Final decisions upon the subject may not be expected for one or two weeks, or even more.

DRAINAGE PLANS.—On Saturday last week the Public Health Committee of Camberwell Borough Council reported the receipt of a letter from the London County Council asking the Borough Council's views on a communication sent to the Spring-gardens authority from the Royal Institute of British Architects expressing the view that compliance with the by-laws respecting the deposit of plans for drainage work involves great and unnecessary expense, and suggesting modification of the by-laws so that they shall only require the submission of a block plan and a written description of the pipes and apparatus. In April last a similar application was received by the Camberwell Council from the Royal Institute of British Architects, and was referred to the Borough Engineer, who reported that he only insisted upon sufficient drawings being deposited to enable the Committee to consider whether the whole of the suggested drainage was in accordance with the general Acts of Parliament, and that he considered that this should be insisted upon more especially as owners were now taking every advantage in claiming drains as sewers in cases where, in the past, the late vestries had not insisted upon the deposition of the full detailed plans. This report of the Borough Engineer was adopted by the Council. The Committee now resolved to inform the London County Council of the foregoing facts, and the decision of the Borough Council thereon. On Monday the General Purposes Committee of Lewisham Borough Council reported being in receipt of a similar letter request from the London County Council. The Borough Surveyor, the Committee's report went on to say, had reported as to the unnecessary expense involved in the preparation of the plans, and was of opinion that the suggestions of the Royal Institute of British Architects might be agreed to, providing that the block plan clearly indicates the position in a street of the intended building, either by sheet, or by indicating the distance of the intended buildings from the nearest street corner. The Committee concurred in the views, and had directed that the London County Council be so informed in reply to their letter.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science, held at Manchester, November 18 and 19, two candidates presented themselves, one of whom succeeded.

DEAN FARRAR MEMORIAL.—On November 1 Lord Peel unveiled the memorial which had been erected in the east, or "House of Commons," porch of the Church of St. Margaret, Westminster, to the late Dean Farrar, who was rector of the parish, 1876-1895. The memorial, designed by Mr. W. D. Carr, consists of a bronze medallion in a setting of carved stone, the bust being modelled by N. N. Hitch. The porch itself was erected in 1891, after designs by J. L. Pearson, R.A.,

Lady Sherbrooke, in memory of her husband, the statesman.

RURAL BY-LAWS.—At the recent meeting of the Chailey Rural District Council, at which it was unanimously decided to take proceedings against Sir William Grantham for building on his estate at Barcombe, in contravention of the by-laws, in the course of the discussion the Council's attitude in the matter was explained by the Rev. A. C. Lucey, the rector of Westwinton, who said the real cause of the dispute was simply this:—Sir William Grantham, before the Local Government Board, had twisted words used by their surveyor and other persons with regard to their not understanding the plans he had submitted. He had taken upon himself the duties of architect and had drawn his own plans, which were not intelligible to them, and they wrote to him in a courteous manner and asked him to produce plans which were intelligible. The whole dispute lay within very small compass:—"We do not understand your plans; will you please explain them?" This, said the rector, ought to be thoroughly understood by the public, because they were showing a tendency to judge the Council before they had heard the Council's side, and local bodies throughout the whole of England should clearly understand what their position was. Their by-laws were the simplest by-laws which could possibly be carried out, while the policy of the Council was in the direction of building cottages in the country districts. Sir William Grantham had remarked sarcastically that two clergymen were on the Council. Few persons knew better than the clergy from personal experience the need of increased cottage accommodation in the country. One of the two clergymen referred to was the owner of considerable more property than Sir William Grantham, and he had shown that he was a great deal better able to manage his land, and understood cottage accommodation better than Sir William Grantham. There were grave moral questions involved in this matter, and the Council had adopted a set of by-laws in order that increased accommodation might be given at as cheap a rate as it was possible to build, and at the same time to safeguard the interests of the working classes. If there were representatives of the working classes on county councils, he perfectly certain that they would stand shoulder to shoulder with the Council against Sir William Grantham.

ROYAL SANITARY INSTITUTE.—The Royal Sanitary Institute held a provincial sessional meeting in the Exchange Hall, Nottingham, on Saturday last. After a civic welcome had been accorded the members, the chairman of the Council of the Institute, Mr. W. Whitaker, B.A., F.R.S., F.G.S., took the chair, and was supported by the Mayor (Alderman J. Bright), and the Sheriff (Dr. T. J. Dabell). Dr. P. Brobbyer, the Medical Officer of Health for Nottingham, read a paper on "Some Present-day Aspects of Conservancy Systems." He remarked that the dry system which obtained in Nottingham was recognised as obsolete, and the gathering of the members of the Institute would be helpful to the local administrators in their effort to convince the public that the system was out of date and altogether insanitary. A lengthy discussion ensued. The Sheriff of Nottingham spoke of the ravaging effects of infantile diarrhoea, which were always more noticeable in districts where the dry system existed. Dr. H. Handford, the Medical Officer of Health to the Notts County Council, thought that improvements should first be made in regard to elementary schools. Dr. J. R. Kaye (Medical Officer of Health, West Riding District), Mr. H. Gilbert Whyatt (Grimsby Borough Engineer), Mr. A. J. Martin (London), Miss Evans, Dr. J. Robertson (Medical Officer of Health, Birmingham), and others, joined in the debate. The members were subsequently invited by the Health Committee to luncheon, and afterwards visited the Bacteriological and Chemical Laboratory, destructor works, and sanitary wharves, and the works of Messrs. Goddard, Massey, & Warner, engineers.

AN OLD BRITISH ROAD.—Mr. Hilaire Belloc delivered a lecture on Saturday afternoon last at the Botanical Theatre at University College, Gower-street, on "An Old British Road." He said that the subject on which he intended to speak was the old road from Winchester to Canterbury, which he had explored about a year ago, and his object was to show what interest could attach to a subject of this kind. Though the idea was difficult for the modern mind to seize when all our principal thoroughfares ran from north to south, yet it was the case that the earliest of our important roads ran from east to west, that was to say from Dover, which was the natural port of entry

into this island, to Stonehenge, which, in primitive times, was the centre of its political and religious life, and from this there was a branch going to Winchester. Up to the Reformation the South of England contained a very large proportion of the wealth of the country. Winchester was its capital, and remained so right up to the 11th century. Henry II. was probably the first monarch who called London his chief town. One of the causes which contributed to the preservation of the road from Canterbury to Winchester was that a great part of it lay on chalk. He believed that of its total length of 121 miles, about 55 per cent. was on chalk. Another reason was the pilgrimage to the shrine of St. Thomas à Becket, at Canterbury. The murder of St. Thomas took place just before Winchester had lost its old importance. The old road was undoubtedly revived by the pilgrimage, and remained a kind of sacred way until the Reformation. It was an interesting fact that, when Henry VIII. was going to the field of the "Cloth of Gold," he did not go by Rochester, as he might have done, but went instead by the old way to Canterbury. That was, however, the last of the great progresses along the road. It was an excellent instance of the irony of history that the effect of the turnpike system, by inducing people to make use of roads in which there were no turnpikes, was to tend to the preservation of the old roads, which had been on the point of disappearing. About 60 per cent. of the old road from Winchester to Canterbury was well known. Of the remainder about 20 per cent. was guessed at, more or less accurately. In tracing it they were guided by the indications afforded by the road in places now known, by the soils which were chosen, by the trees which grew along it, and by the names of places along the route. He had been able in this way to reconstruct, he might say, the whole way, with the exception of some small gaps. He admitted that as regarded twenty miles it was only a hypothesis, and close on two miles he was unable to find. Of all the important roads of antiquity this one was nearest to London, a great section of it running close to the capital.

MEMORIAL, OXFORD.—A bust of the late Marquis of Salisbury was recently unveiled by Lord Rosebery in the Debating Hall of the Oxford Union Society. The bust, which is the work of Mr. George Frampton, R.A., has been executed in white marble, mounted on a black pedestal about 5 ft. in height.

PROPOSED ENLARGEMENT OF THE WORKHOUSE, COLNBROOK.—At a special meeting of the Board of Guardians held recently a report was presented by Mr. Brook Kitchen, Architect to the Local Government Board, dealing with the present condition of Colnbrook Workhouse, and suggesting various additions and improvements.

WAR MEMORIAL, OMAHÉ.—On the 25th ult. the Duchess of Abercorn unveiled the memorial erected in Omaha to the officers and men of the Royal Inniskilling Fusiliers who were killed in the Boer war. The monument consists of bronze figures of Fame, War, and Death, standing upon a granite base, and has been erected from the designs of Mr. Sydney March, Farnborough, which were accepted in competition. The execution of the work was carried out by Messrs. Elkington & Co., of London.

ASYLUM EXTENSION, BARMING, KENT.—Colonel Hepper, D.S.O., an Inspector of the Local Government Board, recently held an inquiry at Barming Asylum respecting the application to borrow £3,250*l.* for the purpose of enlarging and improving this institution. It is proposed to erect two new blocks, one for males and the other for females, to accommodate some 200 patients. The proposed buildings would have corridors to connect them with the existing structure, and there would also be an addition of two bays. In accordance with the wish of the Lunacy Commissioners there would also be a new isolation hospital erected. There will also be a system of water mains, with pumps and hydrants, in case of fire. Mr. J. W. Jennings, the Asylum Architect, mentioned, in putting in the plans and specifications, that they had been approved by the Commissioners. This closed the inquiry.

WAR MEMORIAL, NORWICH.—On the 17th ult. the Norfolk War Memorial, which has been placed on a site to the north-east of the Shire Hall, was unveiled at Norwich. The design represents a figure of Peace, with outstretched wings, alighting on a globe and sheathing a sword. This is 9 ft. high, and worked in bronze. It symbolises the coming of peace after victory. The head is crowned with laurel leaves, and in the left hand is an olive branch. The figure rests on a sub-structure about 30 ft. high, the lower portion

of which is built of Aberdeen granite. Four pillars rise from this base, and these and the remainder of the masonry of the column are of Portland stone. On each of the four faces of the column is sunk a tablet of gun-metal, upon which the names of the Norfolk soldiers are inscribed. The total height of the column is 40 ft., and its cost 1,500*l.* Messrs. George & Fairfax Wade designed the monument.

CARPENTERS' COMPANY.—At an examination in Sanitary Building Construction, held at the Carpenters' Hall last week, bronze medals were awarded to the following candidates:—Wm. C. Portman, John D. Manners, Thomas C. S. Hall, and E. E. J. Lawrence. Certificates were awarded to Hy. Merryfield, Wm. F. Lombard, E. E. Barks, Wm. E. Sheppard, Hy. Crossley, Wm. Hughes, F. Lambert, E. G. Walker and Fredk. C. Chant (equal), and Robt. H. Griffith.

Legal.

ACTION BY BUILDING OWNER AGAINST ARCHITECT—HEAVY CLAIM FOR DAMAGES FOR ALLEGED NEGLIGENCE.

In the King's Bench Division on the 29th ult. the Lord Chief Justice, sitting without a jury, concluded the hearing of the case of *Hodgson v. Waugh*, after a seven-days' trial.

In this case the plaintiff, Mr. George Herbert Hodgson, a loom maker, of Baldon, near Bradford, Yorkshire, sued the defendant, Mr. John Waugh, an architect and civil engineer practising in Bradford, to recover damages laid at over £10,000 for alleged negligent breach of duty as architect, and also damages for alleged breach of contract. The defendant denied the alleged breach of duty and contract, and counter-claimed for 1,250*l.* for fees for work done and services rendered.

Mr. Lush, K.C., Mr. Clavell Salter, K.C., and Mr. Compston appeared for the plaintiff, and Mr. Tindal Atkinson, K.C., and Mr. F. P. M. Schiller for the defendant.

It appeared from the opening statement of Mr. Lush that about the middle of the year 1900 Mr. Hodgson was looking out for a property to buy, and ascertained that there was a large estate in Hertfordshire known as Heaton Manor, situated half way between Hitchin and Luton, for sale. It consisted of a large hall and some 1,600 acres of land, and there were also residences known as "Summerville," Hexton Lodge, Pegsdon Lodge, and Meg Cottages. The plaintiff found that a certain amount of alteration and repair was necessary, the property having been in the hands of mortgagees for some years, and, being acquainted with the defendant, he engaged him to do the work. At the time plaintiff was in ill-health, and was about to travel abroad, and his case was that, during his absence, the defendant caused work to be done and buildings to be erected which were not in accordance with the plans and estimates he had prepared, and which had been submitted to and approved by the plaintiff. The plaintiff's case in regard to "Summerville" was that the house was rebuilt in such a way as to need a rental of 75*l.* a year to repay the outlay, whereas the defendant had been informed that the plaintiff had a tenant at 50*l.* a year, who would not pay more. As a result, the plaintiff lost the tenant. The learned counsel also enumerated a number of items of expenditure, of which the plaintiff complained, with regard to buildings, the cleaning of a lake, and work upon a mill stream, a trout stream, and ponds.

The plaintiff, examined by Mr. Compston, said he agreed to buy the Hexton Estate, in Hertfordshire, in the year 1900. For twenty years previously it had been in the hands of mortgagees, and the buildings upon it were in a bad state of repair. In August, 1900, he sent for the defendant with regard to the alterations he desired to make. On August 10 defendant accompanied witness and Mrs. Hodgson to the estate. They went over the hall and Hexton Lodge, and discussed what was necessary to be done. They also discussed as to the stables, conservatories, greenhouses, and kitchen garden. It was left that the defendant should send him some plans of the hall, which were found to be in existence. On September 13 he received a letter from the defendant headed, "Report and Estimate." First of all it dealt with the stables, stating that the total cost of the stables would be about 2,855*l.* Then, as to the hall, it ran: "I have gone into this, and, roughly, it means this: The expenditure per plan amended No. 2 would be about 4,500*l.* at the least." Defendant suggested that Pegsdon Lodge should be pulled down altogether. After receiving that report, he met Mr. Waugh at Hexton on September 24. A Mr.

Milligan was there, and he made an offer to take "Summerville" at a rent of 50*l.* a year. They considered the alterations necessary to be done to that house, and witness asked what it would cost to pull the older portion of the house down. Defendant said he thought about 800*l.* Witness replied: "If it can be done at 800*l.*, I will have it done, and Mr. Milligan will take it." Witness also said that, if a dry cellar could be put in there it should be done, but not at an increased cost. It was arranged on that day that the old portion was to come down, but not the new portion, and that 800*l.* was to be the cost. He rejected the scheme as to the glasshouses. He wanted cheap glasshouses built against the existing wall. He also objected to the stables, because he did not want to spend that amount of money on them. He insisted upon that estimate being reduced. Witness said that he would leave all the conservatories and gardens until his return from Japan. On that day he said he would not have Pegsdon Lodge pulled down. On October 10 defendant suggested pulling down Pegsdon Lodge and putting it the other side of the road. Witness would not agree to that. All he asked the defendant to do with regard to Pegsdon Lodge was to increase the bedroom accommodation—in number rather than in height. From Pegsdon they went on to Meg Cottages, and there he simply wanted the bedrooms made rather higher and a slight addition at the west end. From Meg Cottages they went to Hexton Lodge, and he decided that it should come down and be rebuilt.

Had you at any time named a sum that you intended to go to in your outlay upon the hall and all the rest of the works?—I told Mr. Waugh that I would not like to go on with the thing at a greater cost than 10,000*l.* That was to include everything.

Examination continued.
Final drawings were to be put before him before he went to Japan. On October 13 the question was discussed as to the external brickwork of "Summerville." Defendant was not present, but his son, Mr. Brunel Waugh, was, and he produced several sample bricks, and he decided upon a red brick. He received some revised plans before he went to Japan. On October 25 there was the submission of the final plans to him, and he and defendant discussed what should be done as to payment during his absence abroad. Witness told defendant that, if he would undertake to direct Mr. Dean, he would leave that gentleman a power of attorney. Mr. Dean was supposed to do nothing but pay under the direction of the defendant. He gave Dean the power of attorney on October 26. The estimates which were submitted to him along with the general plans were set out in the correspondence on November 2.

May I take it, shortly, when you sailed for Japan you intended the whole of this work, that was to cost 14,596*l.*, should be done in accordance with the plans you had approved?—I did expect it.

His lordship: He had approved of the estimates which amounted to 14,596*l.*?

Mr. Compston: Yes.
Examination continued.
On December 25 he cabled and wrote Dean to suspend the alteration to the hall. On January 17 the contracts for Meg Cottages and the two lodges, Hexton and Pegsdon were signed.

Mr. Compston said that the contracts for Meg Cottages and the two lodges, Hexton and Pegsdon, were all let in one contract, and the three together came to 1,280*l.* The contract of "Summerville" was for 1,975*l.*, for the stables 1,129*l.* for the builder's work alone.

Examination continued.
On his return from abroad in September or October, 1901, he found that his instructions had not been followed. He found that Pegsdon Lodge had been pulled down and rebuilt, and white bricks used instead of red, the new buildings being to the old plan. The height was, he thought, higher than the plans submitted to him, and the bay window was carried up two stories instead of one. With regard to Meg Cottages, he complained that the old buildings had been pulled down entirely, and that the new structure was in white brick instead of red, and that the height was far in excess of the plan. With reference to "Summerville," he found the old part pulled down, white brick instead of red, and that the building was considerably higher—about 7 ft. higher at the ridge—than what it was in the plan submitted to him. The length of the billiard-room was 5 ft. longer than the other one. The house was longer, and nothing at all like what he wanted. He had given orders to Mr. Newton (the builder) direct for work at the stables at "Summerville." The rearrangement there was to be about 30*l.*, but on his return he found that 126*l.* had been paid to Newton for the work there. In addition, defendant had

made various alterations to the buildings without his authority. He found that his instructions with regard to the lake had not been carried out. He also complained of 193*l.* being spent on the mill and the mill stream without his authority.

The witness was taken in great detail through other complaints he had against the defendant for expenditure for work on a trout stream. He said he had never intended to spend 1,500*l.* on greenhouses.

Cross-examined by Mr. Tindal Atkinson, I think you have been a little unfortunate, have you not, with regard to everybody you employed in connection with this estate? Mr. Shillitoe was your agent, was he not?—Yes.

A solicitor at Hitchin?—Yes.
I believe you got rid of him, did you not?—I dismissed him.

And you brought an action against him for damages for cutting some trees, did you not?—And shooting my game with his friends without my permission.

The case lasted for four days, and the verdict was against you, I think?—Yes.

He was suing for his account, and you counter-claimed for very heavy damages. Mr. Dams was the head gardener, was he not?—He was the gardener.

You dismissed him, I think?—I dismissed him.

Mr. Dean, who had been your father's confidential secretary and cashier, I think, in the employment of the family for over forty years, you have recently dismissed?—I said it would be better.

Cross-examination continued.
The first claim was between the estimates and what was spent. The first claim was as between outlay and estimates.

Do you suggest now that Mr. Dean was induced to sign those contracts in excess of the estimates in consequence of Mr. Waugh withholding the instructions you had given him?—Mr. Dean will be able to say.

Now you make those charges both in your statement of claim and in the letter. In the last amended statement of claim I see that you have put that out altogether, and you have put your case now as a claim of the amount between the contract prices and the actual cost, recognising Mr. Dean's signature to those contracts? What made you do that?—There were certain letters came up afterwards, I think. I was advised to do it.

Now let me refer you to this passage in a letter of November 12, 1900: "The letting of all the contracts, both of hall and cottages, must, under no circumstances, exceed estimated estimates, everything included, otherwise you"—that is, Dean—"have full powers to act as you think best." Now, there is your own letter communicating to Mr. Dean the instructions that the estimates were in no sense to be exceeded, and yet you made this charge against Mr. Waugh that he had misled Mr. Dean by not communicating your instructions that the estimates were not to be exceeded. How do you explain that?—I still think that Mr. Waugh ought not to have gone on, in face of what I said to him.

Now, that is not what I ask you. How do you justify this grave charge against Mr. Waugh in the face of this letter?—Because I had given Mr. Waugh definite instructions.

So you had Mr. Dean?—If Mr. Dean does wrong, it does not exonerate Mr. Waugh. Mr. Waugh was under obligations to me to carry out my instructions as well.

Cross-examination continued.
He suggested that Mr. Dean was not informed about the pulling down of Meg Cottages and Pegsdon Lodge until long after they were down. He first learnt that the estimates had been exceeded in October, 1901. He complained about it as soon as he had seen the place, so far as he knew.

Was that after Mr. Waugh had made a request to you that you should pay an amount of 250*l.* to him?—Yes; that was.

It had been "Dear John" I notice up to that time, and, when he asked for 250*l.*, the letters after that time were all "Dear Sir"?—If they are so they are so.

And it was after he had made a claim for 250*l.* on account that you for the first time, on September 21, made any complaint at all as to what had happened. Is that not so?—I wanted to know why this money was to be paid.

Cross-examination continued.
He did not know until his return from abroad that Mr. Dean was getting a weekly report from the clerk of works. If he had known what was afterwards reported to him as to the condition of the Summerville house, he should have had a smaller house built, not occupying so much room. He had claimed 500*l.* from the defendant for having used in Meg Cottages and "Summerville" white bricks instead of red, and was not upon his express instructions that white bricks were used. Defendant had never told him that

Mr. Milligan should be charged more than 50*l.* a year for "Summerville." He had paid Mr. Newton cheques as against the certificates signed by the defendant. He had told Mr. Newton that, as the defendant had ordered the work and given certificates for it, then he (witness) was bound to pay it. After a time, Mr. Dean insisted upon having, and did have, weekly reports from the clerk of works to show how the work was going on. Mr. Waugh was an engineer and architect of experience. He never gave instructions anybody to make the trout stream. He claimed from the defendant 214*l.* upon that head.

By his lordship: On his return from abroad he stopped the work upon the plans at the hall, finding that the tenders were so much in excess of the estimate. The lowest tender was 15,000*l.*, and the highest about 20,000*l.* He declined to go on with it, because defendant's estimate was only about 7,000*l.*

On what ground do you decline to pay your architect?—Because the tenders were so much in excess of the estimates.

Then is he your view, as a man of business, that, supposing an architect has estimated what we will say, 7,000*l.*, and you see his plans and say you do not like them and make alterations, and then tell him to get tenders, if you refuse the tenders you can decline to pay for the plans; is that your view?—I took it that the estimate of 7,000*l.* was a basis upon which I could go.

The Lord Chief Justice: All I can say is that I shall not act upon that view, and I believe it is exactly contrary to the law.

Mr. Tindal Atkinson having cross-examined witness at great length on his various heads of claim against the defendant in the statement of claim, asked if he remembered having an interview with Mr. Newton in his drawing room at "Summerville." The witness said he did remember it. His wife was present at the interview.

Did you say that you had had the strictest investigation made, and that money had passed between Mr. Newton and Mr. Waugh?—Yes; I asked him if he had not paid Mr. Brunel Waugh 10*l.* and never got it back again, and he said that was so.

You said you had had the strictest investigations made?—I said I would have the strictest investigation made.

Did he say "What do you mean?" And did you say this to him, "Now, make a clean breast of it, Mr. Newton"? Now, be careful.—I never said that. I heard that this money had passed, and I said: "If there is anything make a clean breast of it."

Did he say, "Of what?" and did you say "Of money paid to Mr. Waugh"?—I asked him if he had paid more than 10*l.*

Did he say that they had some money when they ran short on one occasion?—That was the explanation he gave.

Did not he tell you, and do not you know perfectly well, that it was a temporary loan obtained by Mr. Waugh when he had to pay his hotel expenses?

The witness said he did not know it, and also, in answer to further questions, denied that he had suggested that Newton's book should be examined for the purpose of ascertaining whether money had passed between him and Mr. Waugh.

Re-examined.
He had dismissed the gardener, Dams, because he had neglected his work. His business belonged to a company, and Dean was asked to resign by the directors. His dismissal was nothing to do with this matter at all. When he first put forward his claim, he did not know that the schedule of prices had been sent to Mr. Dean from Mr. Waugh. He then, upon advice, made certain changes in his pleadings.

Mr. Chas. Dean, examined by Mr. Lush, said he was under the impression that 10,000*l.* represented the total figure plaintiff wished to spend. He had only been to Hexton twice, in addition to the first time, when he went there with the plaintiff. On his first official visit he found that Pegsdon Lodge had been demolished down to the ground. Defendant never consulted him about it. He also found that the new portion of "Summerville" had been pulled down, and Mr. Brunel Waugh said that his father had ordered that to be done. He was never consulted in any way. He did not know until his return from abroad that Mr. Dean was getting a weekly report from the clerk of works. If he had known what was afterwards reported to him as to the condition of the Summerville house, he should have had a smaller house built, not occupying so much room. He had claimed 500*l.* from the defendant for having used in Meg Cottages and "Summerville" white bricks instead of red, and was not upon his express instructions that white bricks were used. Defendant had never told him that

Mr. Hodgson never left the estimates with him. The only copy he ever received was from the defendant. With the exception of one, all the contracts were signed after 1

got the estimates. He wrote a letter to defendant on December 28, 1900, to keep down all contracts compatible with good work, and he repeated that many times in his correspondence. He thought it was usual in contracts that things sprang up which had not been anticipated. He stipulated that he should have a report direct from the clerk of works. He did suggest that, under the power of attorney, he was merely a person to sign cheques.

His lordship: In my opinion, Mr. Atkinson, the rights in this case do not depend upon any supposed authority given to Mr. Dean or supposed consultation with Mr. Dean. I think Mr. Waugh rightly took upon himself the responsibility. The whole question will be whether there is negligence or breach of contract, having regard to the peculiar position in which Mr. Waugh was placed. If Mr. Waugh is not prepared to justify the thing upon the merits, the apparent sanction of Mr. Dean will not justify it.

Mr. Tindal Atkinson: Mr. Waugh is quite prepared to deal with that.

His lordship: I still say, having regard to the fact and taking "Summerville" as an instance, and only as an instance, and not expressing any opinion, and as there had been an estimate for the contract, I think it does impose on the architect carrying out the work the responsibility of taking care to see that only really what is necessary is spent.

Mr. Tindal Atkinson agreed, and said he had nothing further to ask the witness.

Mr. Robert Hudson, examined by Mr. Clavell Salter, said he was a member of the firm of Mawson & Hudson, architects, of Bradford. He had been consulted by the plaintiff with a view to ascertaining why the sums of money he had been called upon to pay had exceeded the estimates and contracts. He had been carefully into the matter with a view to advising him on the subject. He had been many times to the place, and had had the plans, correspondence, prices, and contracts before him.

The witness, having given detailed evidence in support of the claim, also gave evidence as to the defendant's counter-claim, stating that in several instances the defendant's charges were excessive.

Mr. Salter asked the witness what he said as to the plaintiff's claim for 4½ per cent. on the lowest tender that was received at Hexton Hall.

His lordship (to witness): Supposing you had honestly prepared the plans on the instructions of a gentleman asking you to do so, and the specification and orders and the estimate came out at 10,000£, whereupon the employer says, "I am not going on with the work; it is too much money altogether; I am not going to pay," what should you charge for your plans? That is a very simple question, and you ought to have no hesitation in answering it.—I should say, 2½ per cent. on the plans and 1½ per cent. for the quantities.

And for tenders.—Nothing for tenders.

You do not agree with the ½ per cent. ?—No.

Examination continued. Assuming that the owner desired to spend 7,000£, only, the defendant's plans were no use for that purpose. If he had prepared plans which were of no use in consequence of his estimate being wrong, he thought he would have a difficulty in getting his charges in such a case as that.

Cross-examined. He was not a member of the Institute of Architects. It was not the first time that he had heard of a charge of 2½ per cent. upon the execution of plans where they were not carried out. He agreed to the other item of 5 per cent. where the works were carried out.

What is the scale upon which this bill is founded, which you dispute?—The great dispute was that the house was to cost 15,000£, and the estimate was 7,000£.

Is that the only thing you criticise in this bill?—No; I criticise two or three other items.

Mr. John Leaning, a member of the firm of John Leaning & Sons, quantity surveyors, of Bedford-row. Mr. Butler Wilson, F.R.I.B.A., Mr. Christopher Noble, clerk of works; Mr. George F. Cowley, clerk of works; and Mr. George Marshall, a contractor, having given evidence, the plaintiff's case closed.

Mr. Tindal Atkinson said he did not propose making two speeches, but would at once put the defendant into the box. Accordingly,

Mr. John Waugh, examined by Mr. Schiller, said he was an architect and civil engineer, practising in Bradford, and he had practised there for the last thirty-three years. He had known the plaintiff since he was a small boy, and his father before him. At the time plaintiff consulted him about the Hexton Estate he was a very great friend of his. After plaintiff acquired the estate he discussed

the plans with him on three occasions. He had also many talks with the plaintiff as to the alterations. Several sketch plans were submitted in the ordinary way to the plaintiff. Plaintiff finally decided which portion of each building should stop up and which portion should come down. Plaintiff then asked for some estimates, and in an off-hand sort of way witness gave him estimates. They were given verbally. As regarded "Summerville," plaintiff asked him what it would cost, and witness, having regard to what the plaintiff wanted to do, said it would come to about 900£. The plans were from time to time altered by the plaintiff, and, after he had given the estimate, he prepared further plans. He submitted to the plaintiff before he went abroad what were called the approved plans. When these plans were approved they set to work with the rather better-considered contract drawings. The plaintiff had given him no limit with regard to the cost of "Summerville." Plaintiff had never given him a limit which he was not to exceed. He never pretended that the sketch plans were accurate plans. Plaintiff never told him that "Summerville" was not to exceed 1,000£ in cost, nor that the rent of the place was to be based on the expenditure upon it. He did suggest to plaintiff that he should pull down Pegsdon Lodge and put it the other side of the drive. Plaintiff said he would not have it there. Plaintiff had agreed to the contract price paid for the lake work. He had discussed many times with the plaintiff the alterations on the various parts of the estate. With reference to the plaintiff's complaint about the bricks, the witness said that plaintiff never told him that red bricks were to be used.

When plaintiff returned from Japan witness had a conversation with him with regard to the alterations and additions that had been made to the buildings. They went into the thing in detail, and they were together about two or three hours. During the whole of the time that witness was with the plaintiff the latter did not utter one single word of complaint about what witness had done. He had explained to plaintiff what he had found it necessary to do at Pegsdon and Meg Cottages, and that he had had to pull the front wall of the stables of the hall down in consequence of putting a roof on which weighed about thirty tons. It was necessary to put buttresses, because he thought the plaintiff was going to put a thirty-ton roof on, but plaintiff abandoned that idea, and that was the reason the buttresses were there. Before he gave the estimates for the approved plans he had not examined the foundations of "Summerville," the cottages, or Pegsdon Lodge. Plaintiff never complained about the cost of the work until after witness asked for payment of his account. He called Dean's attention to the discrepancy between the estimates and the tenders for "Summerville." Dean said that Newton's tender was considerably more than what he called the summary of prices. Witness replied that that was quite possible, but it was carrying out the plaintiff's wishes.

Dean then said that Newton could have the contract if he would take it for the price of the lowest tender. Witness told Dean that it was usual to give the contract to the lowest tender. Dean replied "business is business, Mr. Waugh." The reason the contract work came to a great deal more than the original estimate was due to the pulling down and raising of the cellars, and the fact that they elected to take nothing from the hall. He explained to Dean the reason of alterations he had not foreseen. He treated nearly all the contracts as measure and value contracts. It was such a complicated case of extras that he thought that was the fairest way to do it. He thought he had treated Hexton Lodge as a lump sum contract, because that was a new building altogether.

Mr. Atkinson said he thought the defendant had made a mistake about the contract of Hexton Lodge, and that he had treated all the contracts in the same way.

The witness stated that he was not quite sure about that matter, as his son attended to it.

The witness was then examined by the learned counsel as to the several matters complained of by the plaintiff, and he justified everything he had done and asserted that he had acted in the best interests of his client.

Cross-examined. Plaintiff told him that he wished to have the finest glasshouses that he could get, and the very best stables in the county. Pegsdon Lodge and Meg Cottages were pulled down on his responsibility. He knew that plaintiff did not wish Pegsdon Lodge pulled down, but it was necessary, because the foundation was bad, and there was a damp course. He did not prepare the quantities for all the buildings himself, but they were prepared in his office. He went over everything that

Newton had done before he certified for it. Plaintiff had never stipulated that red bricks should be used. Plaintiff had never told him with regard to Meg Cottages, that if his scheme could not be carried out he would not have them touched. The calculations he had made were necessarily of a rough character. It could not be an accurate estimate, as he had not got the quantities. He was very much surprised, with regard to Hexton Hall, when the lowest tender came out at 15,000£, instead of 7,400£, and he advised Mr. Dean to abandon that matter until Mr. Hodgson came home.

Mr. Brunel Waugh, examined, said he was an architect and civil engineer, and was the eldest son of the defendant. Before the plaintiff went abroad witness saw him from time to time, and he had many discussions with him with regard to the plans. The plans had to be altered from time to time in consequence of the additional suggestions made by the plaintiff, and that involved more work. The estimates supplied to the plaintiff were, in consequence of the plaintiff starting for Japan, hurried estimates. The reason why the tenders were larger than the estimates was due in a great measure to local circumstances. The carriage of material had a great deal to do with it. They had not at first sufficiently taken into account the cost of carriage.

Mr. Clive Waugh also gave evidence as to the preparation of the greenhouse plans, and as to the work done at the lake.

Mr. Thos. William Cutler, F.R.I.B.A., examined, said he had been in practise for forty-two years. He visited Hexton on July 19 last. Speaking generally, the work appeared to be substantially and well done. From his experience, he found it very difficult to estimate beforehand the actual or probable cost of pulling down and altering a portion of old buildings. A number of things might occur which were not foreseen.

Cross-examined by Mr. Salter. If an architect was asked to give an estimate of the probable cost of building operations, and he wanted to be accurate, he ought to carefully prepare plans and get out quantities. What is there in this case to justify an error of 120 per cent.?

The witness replied that he understood that great hurry was necessary in consequence of the plaintiff starting for abroad, and the drawings were only intended to be approximate drawings, and were not sufficient to enable anyone to give an accurate estimate. The defendant had not sufficient detail to allow him to get an accurate price.

Supposing I told an architect to build me a house and he shows me a plan with rooms of a certain size, has he the right to build them of another size?—Not if you approve the plans definitely.

His lordship: I shall hold, of course, that, if the principal is there, he has no right to do so; but, in this case, the architect was in a very difficult position.

Mr. Salter (to witness): Before involving his principal in any substantial extra cost, should an architect communicate with his principal, if possible?—Well, I should do so.

His lordship asked the witness if there was any custom in the profession when plans were prepared and the work not carried out that the percentage due to the architect was calculated on the provisional amount.

The witness replied that he did not think there was any custom.

Mr. Thomas Wynn, F.S.I., practising as an architect and surveyor at Leeds, gave evidence as to going to Hexton in July last, accompanied by the last witness, to inspect the work. He agreed with what Mr. Cutler had said. He said that, in the case of alterations to old buildings, he had found it necessary in contracts of his own to re-measure the whole of the building. It was very difficult to find out where the old work left off and the new began, and to get at it in a satisfactory manner.

At the conclusion of the defendant's case, Mr. Lush asked and obtained permission to recall the plaintiff for the purpose of rebutting some of the evidence given by the defendant and his son, Mr. Brunel Waugh.

The plaintiff accordingly went into the witness-box and denied *in toto* some of the statements made by the defendant and his son as to what took place at the interview after his return from Japan.

Mr. Atkinson, in the course of his address to his lordship on behalf of the defendant, commented on the way the plaintiff had originally launched his case against his client. He said that when the plaintiff started the action he claimed damages against the defendant founded on an express warranty by the defendant as to the figures of the estimate, and the measure of damage claimed was the difference between the amount of this estimate and the amount of the cost. In order to get rid of the difficulty of the fact that the plaintiff's attorney, Mr. Dean, had signed the

contracts which were in excess of the estimates, the plaintiff did not hesitate to charge the defendant with the grossest dishonesty. There existed on the first statement of claim a charge which no one could read without coming to the conclusion that it was a deliberately made charge of the gravest professional misconduct. The object of that charge was to get rid of the difficulty that Dean had signed those contracts. The plaintiff's case being framed on the estimates, it was necessary to get rid of the contracts, and that was the reason the plaintiff made this disgraceful charge against the defendant. In March, 1902, the statement of claim was amended by the plaintiff adding a number of items of claim, a great many of which had now gone. The next amendment was in June, 1904, two years after. It was only a few months ago that the plaintiff withdrew that charge out of the statement of claim, and he then rearranged his claim altogether. The learned counsel said he hoped to convince his lordship that the claim by the amended statement of claim was a claim confined to the difference between the contract price and the cost. He contended that the evidence of the plaintiff could not be relied upon, while, on the other hand, there was absolute confirmation of the evidence which the defendant and his son had given. He submitted that the plaintiff must have known perfectly well that the estimates which the defendant had given him were of the roughest possible character. The plaintiff must have been aware that the estimates were to be taken *cum grano salis*. The learned counsel, having briefly commented on the evidence given, in concluding his remarks, reminded his lordship that the result of this trial was of the greatest importance to his client, because the charge that the plaintiff really made against him was that of professional misconduct. He hoped his lordship would say that there was no ground for the claim made against the defendant by the plaintiff, and that the defendant was entitled to judgment both on the claim and counter-claim.

Mr. Clavell Salter replied on behalf of the plaintiff. He contended that the evidence showed that the defendant had, in the enforced absence of the plaintiff abroad, done his work in a manner which was at once unskillful, careless, and reprehensible. The defendant had ignored the contract to build for a lump sum of money, and had treated the whole matter as though the parties had made a perfectly different contract—viz., that this work should be done, and then, on measurement, whatever it came to on the schedule of prices, should be paid by one party to the other. The defendant had arrived at that sum regardless of the contract, and therefore he had been guilty of a breach of duty in certifying that that was the sum the plaintiff was liable to pay. With reference to the counter-claim, the learned counsel said the only really important point there, was as to whether the defendant was entitled to anything with regard to the preparation of the Hexton Hall plans. He submitted he was not.

At the conclusion of the learned counsel's address, Mr. Lush disclaimed any intention during his conduct of the case of imputing anything like fraud to the defendant or his family.

His lordship said he was pleased to hear that, but asked if that withdrawal was made on the instructions of the plaintiff.

Mr. Lush said it was not, as, unfortunately, his client was not then present in court.

His lordship said that he could not take any notice of the withdrawal unless it was made with the plaintiff's authority. He said that the learned counsel had properly conducted the case on his instructions, and therefore no disclaimer from him was necessary. If, however, any disclaimer was coming from the plaintiff, it must be made with his authority. He hoped to give judgment next Monday week, or, at any rate, next Monday fortnight. Judgment was accordingly reserved.

WEST-END BUILDING DISPUTE.

The case of Julie Dutrey v. The Assets Realisation Company, Ltd., came before Mr. Justice Buckley, in the Chancery Division, on the 29th ult., an action by the plaintiff for damages for injury occasioned to her business premises owing to the action of the defendants.

Mr. Arthur, K.C., and Mr. Foà appeared for the plaintiff; and Mr. Buckmaster, K.C., and Mr. H. Gregory for the defendants.

It appeared that the plaintiff was the lessee of 5, Hanover-square, for a term of twenty-one years from September, 1899, and on those premises she carried on the business of a Court dressmaker. She asserted that she was entitled by prescriptive right to support from the adjoining house—viz., Hanover-buildings, the property of the defendant company. The

plaintiff's case was that defendants had deprived her premises of support by pulling down the old buildings and erecting in their place another building of increased height without properly supporting or securing plaintiff's walls, thus weakening them and cracking them. The wall separating her building from the defendants' had been fractured, and, in consequence of its settlement, the front wall, partitions, and ceilings, and papers were damaged on the second and third floors. The stonework in front of the house was also fractured. By an agreement the plaintiff entered into with the defendants in March, 1901, defendants agreed to indemnify the plaintiff against all damage in consequence of their building operations, and she sought damages accordingly. The plaintiff also alleged that the defendants had interfered with her trade, some soot and bricks falling down a chimney and damaging some valuable goods.

Defendants set up the defence that the damage was not due to any action of theirs, but to the age and other things connected with the plaintiff's building.

The expert witnesses called for the plaintiff were Mr. A. J. Hopkins, Mr. William Woodward, Mr. E. A. Lansdowne, and Mr. P. A. Hopkins.

For the defendants Messrs. Sawyer & T. H. Watson, architects, were called and gave evidence.

His lordship, in the result, in giving judgment, said that upon the evidence he found as a fact that the operations of the defendants had deprived the plaintiff's building of the support to which it was entitled. The result of the evidence showed that bricks were fractured in the party wall line. He found that there had been a subsidence and loss of support to the plaintiff's building. Defendants said that the injuries were due to old age. But he thought that the plaintiff was entitled to damages for the injuries done to her house by the building operations. He gave judgment for the plaintiff for 125 guineas damages and the costs of the action.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

23,786 of 1903.—T. GARE: *Solutions for Treating Wood and other Fibrous and Porous Materials or Compounds.*

A solution for treating wood and other fibrous or porous materials or compounds, consisting of vulcanised rubber or rubber composition in a powdered state, and resin or resin and boiled linseed oil or castor oil, acting as solvents for the said rubber or rubber composition, the said rubber or rubber composition being added to the said oil gradually in small quantities.

27,034 of 1903.—T. RAY: *False Grates or Fuel Economisers for Domestic and like Stoves and Fireplaces.*

According to this invention the front bars of the false grate or economiser project downwards for a suitable depth from a top bar, and are formed with horizontal portions of convenient length to constitute the bottom bars on which the fuel is supported and the ends of the bottom bars are merged into or connected to the usual back bar which is strengthened by a curved bar or plate of more or less "fish belly" shape, or the back bar itself may be "fish belly" shaped. Or again, the ends of the bottom bars may be extended downwards and merged into or connected to a "fish belly" bar or plate, and the usual back bar dispensed with.

28,515 of 1903.—J. R. WARTNABY: *Window Sashes and Frames.*

This invention relates to window sashes and frames, and has for its object certain improvements whereby the usual cords, weights, pulleys, pockets, and hinges are dispensed with, and certain advantages are gained over the ordinary window sash and frame. In this invention the sash style of the window is provided with a suitable number (say four) of projecting pins, pegs, or equivalents, which may project from the edge of the sash, and be held in a forward position by means of suitable springs against the action of which the projecting pins or pegs may be pressed inwards.

28,612 of 1903.—T. W. TWYFORD: *Water-closets and Urinals for Ships, Railway Carriages, and other uses.*

Folding water-closets and urinals, consisting in the arrangement, in combination with a main flushing tank, of a supplementary tank or chamber which is supplied from the main tank with a quantity of water adapted to be delivered into the folding pan or basin on the

latter being turned down for use, the passage of water from the main tank into the supplementary tank, and from the latter to the outlet pipe being controlled by a pair of valves operated mechanically from the folding pan of the apparatus.

28,683 of 1903.—G. A. CHADDOCK: *Window Doors, and similar Aperture-closing Devices.*

Windows, doors, and similar aperture-closing devices which consist in mounting one or more closing devices to swing on a horizontal axis and to slide bodily in a vertical plane either or both of which motions may be utilised to bring the parts into various positions.

28,733 of 1903.—C. H. THOMPSON: *Manufacture of Bricks, Tiles, Slabs, and the like.*

The manufacture of bricks, tiles, slabs, coverings, mouldings, and the like from waste glass, from a mixture of waste glass and other substances, moulded into any desired shape and size, and afterwards placed in a suitable furnace and heated to cause agglomeration and cohesion of the materials used.

109 of 1904.—A. TATE: *Window Sashes and Frames.*

According to this invention a double cord is connected with the upper and also the lower sashes, one end of each cord being attached to each side of the sash at its top end. The cords pass over pulleys situated at each end of the upper portion of the sash frame, down one side of the frame, and then on winding drums arranged preferably below the sill. A separate drum is provided for the double cords of each sash. Each drum is suitably mounted in a bracket, and has a toothed gear wheel rigidly secured thereto. Another toothed wheel, but of smaller diameter than the one mentioned, and carried by the said bracket gears with the first-named wheel. On turning a handle fixed to the spindle of this smaller wheel the cord is caused to be wound upon the drum, and raises the sash. Suitable notches may be formed in a plate with which the handle engages for temporarily holding it, so that the sash can be held at any height. A coil spring is attached at one end to the drum spindle, and the other to a suitable part of the bracket. The object of this spring is to prevent the cord unwinding too rapidly, and thus allow the sash to move gently when it being lowered.

633 of 1904.—M. J. ADAMS: *Lavatory Basins, and Similar Appliances.*

The discharge outlet of a lavatory basin hitherto been at the back or in the centre and has never been placed in the front which it is now desired to place it. The object two-fold. In the front it is practically noiseless and out of the way, and the front opening enables one to use a waste pipe or connexion which also serves to support or carry the basin by the thrust of this waste pipe or connexion against the wall. The special novelty of this invention is the placing of a waste outlet in front for the purpose described in a wide basin or sink. The outlet may be placed at the front, but to one side so that the waste pipe forms one of two more supports.

2,200 of 1904.—J. MUTR: *Window Sashes and Frames.*

In window sash frames the combination comprising sliding bars, grooves, and plates said bars, and opening out sash frames fit with short projecting kneed plates to fit grooves and plates in the sliding bars.

17,662 of 1904.—J. A. SCHNEPPE: *A Comb Door Stop and Burglar Alarm.*

A wedge-shaped door chock provided with contacts for electric light and bell device said chock adapted to be fixed to the floor, a suitable position for preventing the door from being opened, so far as to permit one while at the same time the electric light and bell devices are automatically put into action.

19,628 of 1904.—A. PAILLET: *Pivots for Swing Doors.*

A bearing for swing doors, consisting in a disc fixed to the pivot of the door, an annular ball race provided with swells attached to said disc, a second similar ball race fixed to the bearing of the pivot, balls running in said races, and annular discs for keeping the balls in position.

20,140 of 1904.—E. JOHNSON: *Windows, and the like.*

A sash cord holder for windows, and the like, having either a flat or curved surface, or a one or a series of projections or teeth adapted to fit on the sash stile of such windows, and to hold the sash cord in the position required.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

20,668 of 1904.—R. AMES: Joints for Earthenware and Similar Pipes.

An earthenware or similar pipe provided with spigot and socket ends, the spigot end having a ring at the extreme end thereof and a collar at a distance from the end of the spigot greater than the depth of the socket, and jointing holes being formed in the collar.

21,323 of 1904.—W. P. THOMPSON (S. W. Funk): Casements and Hinged or Pivoted Sashes or Doors.

A window casing, consisting of a window sash pivoted therein by pivots located at one side of the sash and near one edge thereof, and weather strip means secured to the window casing in a plane to one side of the pivots of the sash in a position to engage with the edges of the sash when the latter is closed.

23,316 of 1903.—T. WARBURTON: Reflecting Apparatus for Incandescent Gas Lamps in Domestic and Shop Use.

This consists in attaching mirror reflectors integral with or detachable from a ring which fits on the shoulder or the upper edge of the chimney or globe, or attaches by means of groove pieces or the like to the wire holder in anti-vibration devices, or to a smut catcher.

25,595 of 1903.—R. S. FOSTER: Rotary Fans for Use in Connection with Dust Collection, Ventilation, and other purposes.

This invention applies chiefly to rotary fans for use in connexion with dust collectors for use with high-speed machinery ventilators, but is also applicable to other purposes. The apparatus is cylindrical in form, and connected to a cast-iron base, and provided with one or more inlets and outlets, the inlet being connected with the main dust shaft outside, and to a spiral incline inside the cylindrical case which is connected to the outlet of the chimney or globe, or attaches by means of groove pieces or the like to the wire holder in anti-vibration devices, or to a smut catcher.

27,697 of 1903.—W. BOYES, SEN., and W. BOYES, JUN.: Apparatus for Heating Buildings and other places.

This invention refers to improvements in, and relating to, apparatus for heating buildings, and consists in disposing in what is known as a self-contained stove, heated by burning a fuel, a metallic pipe through which water is passed from the bottom end to the top outer leading to heated pipes located in the building or place to be heated. If desired the metallic pipe may be duplicated as often as desired or required according to the size of the self-contained stove, and for the purpose of increasing the efficiency of the same.

20,455 of 1904.—H. STANTON and A. W. STANTON: Fire-resisting Floors.

This relates to an improvement in fire-resisting floors by means of specially-shaped plates or slabs of cement, concrete, earthenware, or other suitable material arranged so as to cover the lower flanges of metal or bottom of wooden joists resting on or fitted to same.

20,466 of 1904.—E. A. BAKER: Means for Escaping from Burning Buildings, and for other purposes.

Means for escaping from burning buildings, and other purposes, consisting of a rod or bar provided with a bar or other receptacle, and guide wheels or rollers, capable of adjustment and operating in conjunction with a cable wire or cord fixed to said bar, and for connecting same to a rod or bar loosely fixed to a joint of a building.

21,053 of 1904.—A. MORGAN: A Method and Process of Disinfecting.

A method and process of disinfecting, consisting in forming an intimate mixture of about one part of paraformaldehyde, six parts of carbon, and sufficient gum tragacanth or other gum to form a stiff paste, thoroughly pulverising and intimately mixing the ingredients, and forming the mixture by pressure into blocks of any size and shape, and drying the blocks, which are ignited when required, the vapour of formaldehyde being gradually and uniformly disseminated.

1,139 of 1904.—A. MÜLLER: Frame Buildings.

A frame building having masonry or brickwork bases or sills which are erected sets of one or more uprights according to their position on the building, said uprights or certain of them being brought into erect position on said bases by turning them round horizontal bolts arranged at their lower ends, said bolts being carried in stationary angle-irons secured to said bases, and the uprights being then lowered on to the bases and fixed to the angle-irons.

21,140 of 1904.—A. MÜLLER: Frame Buildings.

A construction of frame buildings, consisting in the connection of the central uprights with the ridge beam and the upper ends of the rafters in such a manner that the two ends of the rafters abut above said ridge beam fixed to the head of the upright, and are clamped between broad angle-irons by means of two traversing bolts.

SOME RECENT SALES OF PROPERTY.

Table listing property sales including Estate Exchange Report, Etchingham, Sussex, and various plots and farms in London, Kent, and Sussex.

Table listing property sales including KILBURN—35, Stafford-rd., u.t. 83 yrs., g.r. 74, w.r. 81/18s., and other properties in London, Kent, and Sussex.

By MAY & ROWDEN.
Regent-street.—5 and 6, Coach and Horses-yd. (showrooms, etc.), l. yr. 95l. 1,750
Kensington.—3, Liscafer, w.k. 79 yrs., R.T. 10l., yr. 50l. 400
Belgravia.—Wilton-cres., etc., l.g.r. 50l., u.t. 18l. yrs., gr. 12l. 400

By FRANK WINTERTON.
Hford, Essex.—19 and 20, The Market (s.), l., yr. 95l. 1,125
Clapton.—10 to 16 (even), Maclaren-st., u.t. 75 yrs., g.r. 20l., w.r. 130l. 560

Contractions used in these lists.—F.g.r. for fresh ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; yr. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; h.h. for hothouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

FRIDAY, DECEMBER 2.
Institution of Civil Engineers (Students' Meeting).—Mr. R. T. McCallum, M.Inst.C.E., on "Midland Railway, West Riding Lines: The Construction of Contract No. 1." 8 p.m.

SATURDAY, DECEMBER 3.
Incorporated British Institute of Certified Carpenters.—Annual General Meeting. 6 p.m. (Carpenter's Hall, E.C.7.)

MONDAY, DECEMBER 5.
Royal Institute of British Architects.—(1) Business Meeting; (2) Adjourned Discussion on Papers read at the last meeting on "Ferro-Concrete." 8 p.m.
Liverpool Architectural Society.—Paper by Mr. Maurice B. Adams, entitled "More About Modern Libraries," illustrated by plans and examples. 6 p.m.
Society of Engineers.—Mr. W. E. Storey on "Condensing Machinery." 7.30 p.m.

TUESDAY, DECEMBER 6.
Northern Architectural Association.—The Rev. H. C. Windley, M.A., on "English Church Architecture in its Relation to English History." 7.30 p.m.
Institution of Civil Engineers.—(1) Paper to be further discussed, "Distribution of Electrical Energy," by Mr. J. E. Clewton Snell, C.E. (2) Time permitting, Paper "On the Construction of a Concrete Railway Viaduct," by Messrs. A. Wood-Hill and E. Davy Palm, B.A. 8 p.m.

WEDNESDAY, DECEMBER 7.
Royal Archaeological Institute.—(1) Mr. J. Hilton, F.S.A., on "The Hildrathen and Saalburg in Germany"; (2) Mr. Philip M. Johnston on "Mural Paintings Recently Discovered in Trotton Church, Sussex," etc. 4 p.m.
Builders' Foremen and Clerks of Works Institution.—Ordinary Meeting of the Members. 8 p.m.
Edinburgh Architectural Association.—"A Practical Demonstration of Architectural Modelling," by Mr. G. Hayes. 8 p.m.
Society of Arts.—Mr. W. F. Reid on "The International Exhibition at St. Louis, U.S.A." 8 p.m.
Institute of Sanitary Engineers, Ltd.—(1) Half-yearly General Meeting at 4.30 p.m., at the Offices of the Institute; (2) Annual Dinner 6.30 p.m., at the Holborn Restaurant.

Institution of Civil Engineers.—Students' Visit to the Motor-Car Works of Messrs. D. Napier & Son, Acton Vale, W.

THURSDAY, DECEMBER 8.
Society of Antiquaries.—8.30 p.m.
Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Dr. J. C. Thresh on "Water and Water Supply."—I. 7 p.m.
Institution of Electrical Engineers.—(1) Conclusion of Discussion on Paper on "Hydrodynamical and Electromagnetic Investigations Regarding the Magnetic-Flux Distribution in Toothed Core Armatures," by Professor H. S. Hole-Shaw, F.R.S., A. Hay, D.Sc., and F. E. Powell; (2) "Studies in Magnetic Testing," by Mr. G. F. C. Searle, M.A. 8 p.m.

FRIDAY, DECEMBER 9.
Architectural Association.—Paper by Mr. T. Raffles Davison, entitled "Some Architectural Reflections," 7.15 p.m.
Edinburgh Architectural Association.—Associates' Annual Dinner.

SATURDAY, DECEMBER 10.
British Association of Waterworks Engineers (Ninth Winter Meeting at the Geological Society's Rooms, Burlington House, W.).—(1) Ballots will be taken for the Council and Officers for 1905-6, and for new Members and Associates; (2) Paper entitled "The Appleton Extensions of the Warrington Corporation Waterworks," by Mr. Geo. Mitchell; (3) Paper on "Supply of Surface and Underground Water to Towns" by Mr. Frank Latham; (4) Paper entitled "Notes on Electrically-driven Pumping Plant for Water Supply, and Storage of Water under Pressure," by Mr. J. Hinton; (5) Presentation to Dr. Kemm of Gift subscribed by Members and Friends who took part in the Tour in Belgium. 11 p.m.

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Hard Stocks	1 14 0	per 1000	along in river.
Grizzles	1 13 0	"	"
Facing Stocks	2 12 0	"	"
Shippers	2 10 0	"	"
Flettons	8 0 0	"	railway depôt.
Red Wire Cur	1 14 0	"	"
Best Fareham Red	3 12 0	"	"
Best Red Pressed	5 0 0	"	"
London Facing	4 4 0	"	"
Best Blue Pressed	4 10 0	"	"
Staffordshire	4 4 0	"	"
Do. Bullnose	4 10 0	"	"
Do. Stourbridge	4 8 0	"	"
Fire Bricks	4 8 0	"	"

GLAZED BRICKS.

Best White and Ivory Glazed	13 0 0	"	"
Stretchers	12 0 0	"	"
Heads	17 0 0	"	"
Quoins, Bullnose, and Flats	19 0 0	"	"
Double Stretchers	16 0 0	"	"
Double Headers	16 0 0	"	"
One Side and two Ends	19 0 0	"	"
Two Sides and one End	20 0 0	"	"
Splays, Chamfered, Squints	20 0 0	"	"
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	"	"
Quoins, Bullnose, and Flats	14 0 0	"	"
Double Stretchers	15 0 0	"	"
Double Headers	14 0 0	"	"
One Side and two Ends	15 0 0	"	"
Two Sides and one End	15 0 0	"	"
Splays, Chamfered, Squints	14 0 0	"	"
Second Quality White and Dipped Salt Glazed	2 0 0	less than best.	

Thames and Pit Sand..... 7 0 per yard, delivered.
Thames Ballast..... 6 0 " "
Best Portland Cement..... 23 0 per ton, " "
Best Ground Blue Lias Lime 20 0 " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. depôt.

STONE.

BATH STONE—delivered on road wag- s. d.
gous, Paddington Depôt 1 6½ per ft. cube.
Do. do. delivered on road wagons,
Nine Elms Depôt 1 8½ " "
Portland Stone (20 ft. average).....
Brown Whitbed, delivered on road
wagons, Paddington depôt, Nine
Elms depôt, or Fimlico Wharf... 2 1 " "
White Basebed, delivered on road
wagons, Paddington depôt, Nine
Elms depôt, or Fimlico Wharf... 2 2½ " "

Ancaster in blocks..... 1 11 per ft. cube, del. rly. depôt.
Beer 1 6 " "
Greenhill 1 10 " "
Dartley Dale in blocks..... 2 4 " "
Red Corsehill 2 5 " "
Closerum Red Freestone 2 0 " "
Bed Mansfield 2 4 " "

YORK STONE—Robin Hood Quality.
Scrapped random blocks 2 10 " "
6 in. sawn two sides
landings to sizes
(under 40 ft. super.) 2 3 per ft. super. " "
6 in. rubbed two sides
ditto, ditto..... 2 6 " "
8 in. sawn two sides
slabs (random sizes) 0 11½ " "
2 in. to 2½ in. sawn one
side slabs (random
sizes) 0 7½ " "
1½ in. to 2 in. ditto, ditto 0 6 " "

HARD YORK—
Scrapped random blocks 3 0 per ft. cube,
6 in. sawn two sides,
landings to sizes
(under 40 ft. super.) 2 8 per ft. super. " "
6 in. rubbed two sides
ditto 3 0 " "
3 in. sawn two sides
slabs (random sizes) 1 2 " "
2 in. self-face random
flags 0 5 " "

STONE (continued).
HARD YORK (continued)— s. d.
Hopton Wood (Hard Bed) in blocks 2 3 per ft. cube,
sides landings 2 7 per ft. super,
del. rly. depôt. " "
" " " 6 in. sawn both
sides landings 2 7 per ft. super,
del. rly. depôt. " "
" " " 3 in. do. 1 2½ " "

SLATES.

in. in.	£ s. d.	per 1000 of 1200 sq. ft.
20 x 12 best blue Bangor	13 2 6	"
20 x 12	13 17 6	"
20 x 10 first quality	13 0 0	"
20 x 12 "	13 15 0	"
16 x 8 "	7 5 0	"
20 x 10 best blue Fort madoc	12 12 6	"
16 x 8 "	6 12 6	"
20 x 10 best Eureka un- fading green	15 17 6	"
20 x 12 "	15 7 6	"
18 x 10 "	13 5 0	"
16 x 8 "	10 5 0	"
20 x 12 permanent green	11 16 6	"
18 x 10 "	9 12 6	"
16 x 8 "	6 12 6	"

TILES.

Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. "
Best Broseley tiles	50 0	per 1000 "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. "
Best Raubon red, brown, or brindled do. (Edwards)	57 6	per 1000 "
Do. Ornamental do	60 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 0	" "
Best Red or Mottled Stafford- shire do. (Peakes)	51 9	per 1000 "
Do. Ornamental tiles	54 6	" "
Hip tiles	4 1	per doz. "
Valley tiles	3 8	" "
Best "Rosemary" brand plain tiles	48 0	per 1000 "
Best Ornamental tiles	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 8	" "
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 "
Do. pressed	47 6	" "
Do. Ornamental do	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 6	" "

WOOD.

At per standard	£ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15 10 0	16 10 0
Deals: best 3 by 4 in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	14 10 0	15 10 0
Battens: best 2½ by 6 in. and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6 in.	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	7 in. and 8 in.
Battens: seconds	0 10 0	4 0 0
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	8 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0

Foreign Sawm Boards—
1 in. and 1½ in. by 7 in. 0 10 0 more than battens
¾ in. 1 0 0
At per standard of 50 ft.

Fir timber: best middling Danzig or Mamel (average specification) 4 10 0 5 0
Seconds 4 5 0 4 10 0
Small timber (8 in. to 10 in. and 3 in. by 9 in.) 3 12 6 3 15 0
Small timber (5 in. to 8 in.) 3 0 0 3 0 0
Swedish harks 2 15 0 3 0 0
Fitch-pine timber (30 ft. average) 3 5 0 3 15 0

JOINERS' WOOD. At per standard

White Sea: first yellow deals, 3 in. by 11 in.	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
3 in. by 9 in.	13 0 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	12 10 0	13 10 0
Battens	10 0 0	11 0 0
Fitch-pine deals:— Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	40 0 0	upwards
Oddments	28 0 0	"
Seconds, regular sizes	13 0 0	"
Yellow Pine oddments	25 0 0	"
Kauri Pine—Planks, per ft. cube	0 3 6	0 5
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3
Small	0 2 3	0 2
Wainscot Oak Logs, per ft. cube	0 5 0	0 5
Dry Wainscot Oak, per ft. sup. as inch do.	0 8 0	0 0
¾ in. do.	0 7 0	0 0

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Prerequisites.	Designs to be Delivered
* Proposed Northumberland War Memorial	Committee	Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Alterations, etc., to Parochial Schools, Garnford	Manchester Tramways Committee	Clark & Moscrop, Architects, Fecthams, Darlington	Dec. 8
Vans, Lorries, Lamps, etc.	Manchester Tramways Committee	J. M. M'Elroy, Manager, Tramways Department, Manchester	Dec. 6
Drainage, Paving, etc., Streets, Bradford	Hale U.D.C.	Paving, etc., Department, Town Hall, Manchester	do.
Drainage, Paving, etc., Streets, Ardwick	do.	do.	do.
Sewering, etc., Streets, Openshaw	do.	do.	do.
Drainage, etc., Streets, Rusholme	do.	do.	do.
Sewering, etc., Streets, Newton Detached	do.	do.	do.
Sewering, etc., Streets, Newton Heath	do.	do.	do.
Drainage, etc., Morningside	do.	do.	do.
Electric Lighting, etc., Dennistown District Library	Glasgow Corporation	J. R. Rhind, Architect, 67, Hope-street, Glasgow	do.
Stores	Trindon Grange Collieries	Storekeeper, Trindon Grange Colliery, co. Durham	do.
Street Improvements	Stockton-on-Tees Corporation	M. H. Sykes, Borough Surveyor, Town Hall, Stockton	do.
Improvements, Back Eddon-place	Hullfax Highways Committee	J. A. Angell, Surveyor, U.D.C. Offices, Beckonham	do.
Alterations to Mitre Hotel, Market-street	Hullfax Improvement Committee	J. Lord, Borough Engineer, Town Hall, Hullfax	do.
Buildings at Corporation Store Yard, Mill-road	Cambridge Town Council	Borough Surveyor, Guildhall, Cambridge	do.
240 Mild Steel Tubes	Warrington Sanitary Committee	Manager, Longford Depot, Warrington	do.
Works at Fire Station	Beckenham U.D.C.	Sanitary Surveyor, 7, Victoria-place, Gardale	do.
Cotehill Sewer	Newcastle-on-Tyne Education Com.	Young & Mackenzie, Archts., Scottish Provident Buildings, Belfast	Feb. 1
Wood Ceiling, etc., at First Presbyterian Ch., Bangor	The Managers	A. Goddard, Sec., Edu. Offices, Northumberland-rd., N.-on-Tyne	Dec. 6
Painting, etc., Bath-lane School	Shrewsbury Improvement Com.	Maiden's Head Hotel, Uckfield	do.
Additions to Uekfield National School	N. Staffordshire Hospital Board	H. C. Edmonds, Borough Surveyor, The Square, Shrewsbury	do.
Street Works	do.	E. Jones, Architect, 16, Albion-street, Hanley	do.
Two Concrete Siles, Bagnall Smock Hospital	Edinburgh Corporation	do.	do.
Laundry Machinery and Plant	Leeds Corporation	R. Morham, City Architect, City Chambers, Edinburgh	do.
Palaters' Work at Exten. of Electric Light Station	Belfast Improvement Committee	City Engineer, Municipal Buildings, Leeds	do.
Private Street Works, Armlay and Bramley	do.	Sanitary Surveyor, 7, Victoria-place, Gardale	do.
Cotehill Sewer	do.	City Surveyor's Office, Belfast	do.
Sewer, Stranmillis-road	Tottenham U.D.C.	do.	do.
Sewering, Paving, etc., of New Streets	Hambleton E.D.C.	Council's Clerk, Council's Offices, 712, High-road, Tottenham, N.	do.
*Sinking Well and Borehole, etc., at New Baths	East Indian Railway Co.	Inspector of Nuisances, Council Offices, Ashley-road, Hale	Dec. 7
Scavenging	Shilpley U.D.C.	E. L. Lunn, Architect, 36, High-street, Guildford	do.
Entrance Gates at Sewage Works, Bramley	Hendon Guardians	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Spring Steel	Whickham U.D.C.	Abm. Sharp, Archt., Pearl Assurance Buildings, Market-st., Bradford	do.
Library, Leeds-road, Shilpley	Sheffield Education Committee	F. J. Sastbrook, Clerk Union Offices, Edgware	do.
Four Shops, etc., Cliff-st. and Cross-st., Bridlington	English Calvinistic Methodists	J. B. Renton, Surveyor, Council Offices, Whickham	do.
29 Fathoms best Yellow Deal Ends, Edgware	Manchester Parks Committee	Office of Committee, Leopold-street, Sheffield	Dec. 8
Scavenging	Manchester Parks Committee	City Architect, Town Hall, Manchester	do.
Plumbers' and Glaziers' Work	Burma Railways Co.	H. M. Whitehead, Engineer, Penkridge, Stafford	do.
Chapel, Lecture Hall, etc., at Gillach, Pengam	Birmingham Public Works Comtee.	Office of Company, 76, Gresham House, Old Broad-street, E.C.	do.
Breeding Cactus-houses, etc., Alexandra Park	Dublin Waterworks Committee	do.	do.
Sewerage Works, Forthouses, near Wolverhampton	Hebburn U.D.C.	J. Price, City Surveyor, Council House, Birmingham	do.
Girder Bridges (Three 100-ft. spans)	Ealing Town Council	do.	do.
Girder Bridges (Two 100-ft. spans)	Director-General, Ordnance Survey	City Architect, Municipal Buildings, Cork Hill, Dublin	do.
*Pools and Stores	Hull Corporation	A. Brown, City Engineer, Nottingham	do.
Road Works at Salfrey	Admiralty	H. Paterson, Surveyor, Argyle-street, Hebburn	do.
Concrete Bridges on the Hennebique System	Leeds Corporation	Borough Engineer, Town Hall, Ealing, W.	do.
Central Fire Station, Great Brunswick-street	Glamorgan Quarter Sessions	Office in Charge of Stores, Ordnance Survey Office, Southampton	Dec. 1
Stores and Materials	Metropolitan Asylums Board	A. E. White, City Engineer, Town Hall, Hull	do.
Street Works	Mr. B. E. Nightingale	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
*Making-up Roads, etc.	Mountain Ash U.D.C.	City Engineer's Office, Municipal Buildings, Leeds	Dec. 11
Warehouses, Amlmore Distillery, Forge	Salford Education Committee	Clerk to Glamorgan County Council, Westgate-street, Cardiff	do.
Sewering, Paving, etc., of North Walls	Edin. & Leith Gas Commissioners	Office of the Board, Embankment, E.C.	do.
*Additions, etc., Coast-guard Bldgs., Woodbridge Haven	do.	do.	do.
Paving and Flagging Streets	do.	do.	do.
Police Station at Seven Sisters	do.	do.	do.
Police Station at Cwmgorse	do.	do.	do.
*Re-making Roads, etc., Dartford, Kent	do.	do.	do.
*New Store Accommodation at School, Swanley	do.	do.	do.
*Erection of Electrical Traveller	do.	do.	do.
Private Street Works, Margaret-street, Abercrom	do.	do.	do.
Painting Schools	do.	do.	do.
Purifying Plant House	do.	do.	do.
Purifying Plant	do.	do.	do.
Fire Station, Stables, Cart Shed, etc.	do.	do.	do.
Stores	do.	do.	do.
Teachers' Rooms, Abernethy School	do.	do.	do.
Altering Fireplaces, etc., Boys' Department, ditto	do.	do.	do.
New Latrines and Repaving Yard, Dowdals School	do.	do.	do.
Materials	do.	do.	do.
Road Works, Sydenham and Forest Hill	do.	do.	do.
4,000 tons of Granite Setts	do.	do.	do.
500 tons of Broken Threlkold Granite	do.	do.	do.
600 tons of Broken Threlkold Granite	do.	do.	do.
Vicarage House at Ynisher, Porth	do.	do.	do.
*Wood and Corrugated Iron Fire-escape Shed	do.	do.	do.
*Demolishing and Rebuilding Warehouse	do.	do.	do.
Seven Cast-Iron Water Tanks, Elec. Stn., Greenwich	do.	do.	do.
General Stores	do.	do.	do.
Locomotive Stores	do.	do.	do.
Roofing (Five Spans of 100 ft. by 25 ft.)	do.	do.	do.
60 tons of Fenels	do.	do.	do.
Twenty Labourers' Cottages	do.	do.	do.
Surface-water Drain (North-road)	do.	do.	do.
Sewer and Drain, Dormers Wells-lane	do.	do.	do.
Sewer and Drain, Western-road	do.	do.	do.
Making-up roads	do.	do.	do.
Iron Pipes	do.	do.	do.
Iron Churchyard Fence, Helton-le-Hole	do.	do.	do.
*New Fire Main, Chimney shaft, Boiler, etc.	do.	do.	do.
Electric Lighting, Morningside-road Library	do.	do.	do.
Fire Engine Station and Depot	do.	do.	do.
Stores, etc.	do.	do.	do.
Electric Lighting part of Workhouse	do.	do.	do.
*Boat Shed and Workshops, Rotherhithe	do.	do.	do.
*Annual Contracts	do.	do.	do.
*New Coastguard Buildings at Stubbington, Hants	do.	do.	do.
*Enlargement of Post Office at Wisbech	do.	do.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Stores	Bradford Corporation	Tramway Offices, 15, Bridge-street, Bradford	Dec. 17
Materials	Kent Bridges & Roads Committee	County Surveyor, Maidstone	do.
*Erection of Branch Library, Brockley	Lewisham Borough Council	A. L. Guy, 4, Verulam-buildings, Gray's Inn	do.
Bathhouse and Pavilion at Glasgow Green	Glasgow Corporation	Office of Public Works, City-chambers, Glasgow	Dec. 19
Laying Main between Perth and Pontefridd	Southern Waterworks Co.	Manager's Office, 28, Gelliwasted-road, Pontefridd	do.
Sauntery Towers, etc., at Workhouse, Tranmere	Ritchehead Guardians	E. Kirby, F.R.I.B.A., 5, Cooks-street, Liverpool	do.
58 Houses & Two Shops, Cwmaman Estate, Cwmaman	Abertool Building Co., Ltd.	J. Lewellin, Smith, & Davies, Architects, Aberdare	do.
Detached Residence, Alford, Lines	Pontefridd U.D.C.	W. Mortimer & Son, Architects, Corporation-street, Lincoln	Dec. 29
Alterations, etc., Cordenham School	Welwyn R.D.C.	P. R. A. Willoughby, Surveyor, Pontefridd	do.
Engines and Pumps (Sewage Disposal, Contract 11)	John Rural Board Committee	H. Walker & Son, Engineers, Albion-chambers, Kings-st., Nottingham	Dec. 21
Extension of Cemetery, Uttoxeter	Maidstone R.D.C.	F. S. Hawthorn, Solicitor, Uttoxeter	do.
Team Labour, Stone Carting and Road Watering	Lewisham Borough Council	M. C. Warne, Surveyor, Barming, Maidstone	do.
Underground Conduits, Great Dover-street	Barnet R.D.C.	A. Harrison, Borough Engineer, Town H.H., Valworth-road, S.E.	do.
*Road and Sewer Works	Glasgow Corporation	Council's Surveyor, 143, Mount-view, High Barnet	do.
100 Electric Motor Equipments and Spare Parts	H.M. Works	J. Dalrymple, 102, Henfield-street, Glasgow	Dec. 22
*Head Post Office at Weymouth	Wombwell U.D.C.	H.M. Office of Works, Storey's Gate, S.W.	do.
Free Library, Wombwell	Lewisham Borough Council	A. B. Lipford, Architect, Carlton Villa, Wombwell	Dec. 24
Stables, Cart Sheds, etc., at Home Park Depot	Wigmors R.D.C.	Wilcox & Raikes, Engineers, 63, Temple-row, Birmingham	Dec. 24
Sewerage Works, Wigmors	River Water Commissioners	Henderson & Hall, Architects, 28, John-street, Sunderland	Jan. 4/05
New Board-room and General Offices	Gisset Corporation	W. Haustock & Son, Architects, Branch-road, Batley	No date
Free Library, Wombwell		R. W. Carling & Co., St. Dunstan's-bldgs., St. Dunstan's-hill, Ldn.	do.
Ironworks. (Roofing 2 Sheds, Inverkeithing Paper Wks.)		Mr. Houston, Architect, St. Margaret-street, Dunfermline	do.
3,000 tons of Portland Cement		Preston Granite Concrete Co., Ltd., The Docks, Preston	do.
Stone for Roads	Northumberland C.C.	County Surveyor, Moot Hall, Newcastle-on-Tyne	do.
*Seven Villas, Willenhall Park Estate	London and Dis. Land, etc., Co., Ltd.	Company's Offices, 9, Great Castle-street, W.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Leading Foreman (Three)	Manchester Corporation	£3 3s. per week each	Dec. 7
*Assistants in Surveyor's Branch	London C.C.	£250 per annum	Dec. 15

Those marked with an asterisk (*) are advertised in this number.

Competitions, iv.

Contracts, iv. vi. viii. x.

Public Appointments, xiv.

TENDERS.—Continued from page 580.

LONDON BOARD OF EDUCATION TENDERS.

Hockley, C., Sinton-road (for heating apparatus in connection with enlargement).

R. Clarke	£94 12 0	J. Richmond & G. Grundy	97 0 0	£53 8 6
G. & F. Bradley	71 0 0	W. G. Cannon & I. & F. May	66 0 0	
Stevens & Sons	65 0 0	London-road, Southwark*		59 15 0

FOR CLEANING SCHOOLS DURING THE CHRISTMAS HOLIDAYS, 1904:—

Buttress, Shillington-street (Special, blind and manual training centre).

R. A. Jewell	£116	E. Flood	£85
A. E. M. Patrick	107	Hudson Bros	81
Marlin, Wells & Co., Ltd.	93	W. Johnson & Co., Ltd., Wandsworth	89
E. B. Tucker	89	Common*	75

Berouesday, Page's-ten.

E. P. Bulled & Co.	£242 0	Lathey Bros.	£197 0
H. Lane & Son	282 0	R. J. Williams, 81, Rice & Son	282 0
W. Sayer & Son	225 0	Borough*	191 10

Camberwell, N., Leipsic-road.

R. B. Tucker	£280 0	J. F. Ford	£235 10
W. V. Goad	280 0	Maxwell Bros.	
H. Lipe	275 0	Co., Ltd., 259, Holloway Bros.	229 0
W. Sayer & Son	248 0	W. R. & A. Hyde	210 0
E. Triggs	210 0	Church-road, Brighton*	197 0
Holiday & Greenwood, Ltd.	239 0		

Fulham, Star-lane.

Thompson & Beveridge	£233 0	Spencer, Santo, & Co., Ltd., 259, Holloway Bros.	£167 0
Holloway Bros. (London), Ltd.	197 0	Warwick-road, Kensington*	109 0
S. Polden	189 0		
W. R. & A. Hyde	155 10		

Hoxton, Chatham-gardens.

H. Runham Brown	£355 0	Barrett & Power	£120 0
Vigor & Co.	154 0	C. Dearing & Son, 61, Hallford-stevens Bros	128 12
St. Islington*	89 0		

Kennington, Eversington-road (painting interior of new parlour and cleaning interior of old parlour).

T. J. Green	£431	Rice & Sons	£292
W. King & Sons	375	J. Appleby & Sons	289
G. Brittain	330	Holliday & Greouwood, Ltd.	287
Martin, Wells, & Co., Ltd.	320	J. Garrett & Son, 17, Balham-hill*	255
J. & M. Patrick	319		

Kennington, "Springfield."

J. R. Sims	£289	E. Triggs	£199
Maxwell Bros., Ltd.	220	E. P. Bulled & Co.	183
Rice & Son	212	E. Flood	160
W. Johnson & Co., Ltd.	207	J. Garrett & Son, 17, Balham-hill*	170

Kennington, S., Gloucester-grove, East.

Charles Wall, Ltd.	£345	Spencer, Santo, & Co., Ltd., 259, Warwick-road, Kensington*	£158
S. Polden	220		
E. Flood	218		
Holloway Bros. (London), Ltd.	201		

Lambeth, N., Walnut Tree-walk.

W. King & Son	£320 0	J. F. Ford	£162 18
R. Sims	288 0	W. Smith & Son, W. Hornet	249 10
G. Brittain	198 0	Harleyford-road, Kennington*	157 0
J. Appleby & Sons	197 0		

Linchouse, Northey-street (Infants' department and manual training centre).

J. F. Holliday	£126 10	T. S. Elkington & Sons	£77 4
W. Shurmmur & R. Woolaston & Co.	108 0	Vigor & Co.	77 0
Co.	89 0	St. Klerthorpe	
J. Haydon & Sons	83 0	St. Poplar*	65 0

Rotherhithe, Silwood-street.

W. Sayer & Son	£304 0 0	J. C. Chalkley	£100 0 0
J. Harries & Co.	232 0 0	Holliday & Greenwood	177 0 0
H. Groves	227 0 0	Ltd., Brixton*	
W. Banks	219 18 6		
W. J. Howie	210 0 0		

St. George-in-the-Field, Lower Chapman-street.

J. F. Holliday	£331 0 0	R. Woolaston & Co.	£265 0 0
J. Haydon & Sons	284 10 0	T. S. Elkington & Sons	250 14 6
Woolaston Bros.	270 0 0	J. Dolman & Sons	243 0 0
J. Haydon & Sons	268 0 0	Co., 4, Ellerhorpe-street, Poplar*	
H. Bouneau	268 0 0		

Southwark, W., Holland-street.

G. Foxley	£160	J. F. Ford, 80, Fitzalan-street, Kennington-road*	£117
W. Hornet	167		
(G. Brittain)	144		
Rice & Son	121 18 6		

Stepney, Garden-street (Temporary).

A. E. Symes	£150 0	J. F. Holliday, 37, J. Haydon & Sons	£120 12
T. S. Elkington & Sons	117 5	Commercial-rd., Stepney*	£90 10
Vigor & Co.	115 0		

Woolwich, Purcell-road.

P. S. Howard	£246 4	H. Groves, Enness Bros	198 0
W. J. Howie & Son	191 10	Greenwich*	£172 0 0
E. Proctor & Son	189 0	W. Banks	159 17 6
W. J. Howie	179 0		

Woolwich, Vicarage-road.

P. S. Howard	£243 0 0	E. Proctor & Son	£184 0 0
W. Rayter & Son	199 10 0	W. Banks, 18, Egerton-road, Greenwich*	174 17 6
Enness Bros	194 4 6		
H. Groves	185 0 0		

Heating new workshops and drawing office rooms now being erected by the Council at the north-west corner of the London County Council Shoreditch Technical Institute.

R. E. May	£495 0	R. Crittall & Co	£358 0
Rosser & Russell	489 10	G. & E. Bradley, Clements, Peakes, & Co.	455 0
C. & Co.	389 0	Strode & Co.	389 0

Deptford, Traudley-road (manual training centre).

W. V. Goad	£290 0 0	W. Akers & Co.	£780 0 0
E. B. Tucker	192 14 6	F. & H. F. Higgs	77 0 0
Maxwell Bros., Ltd.	870 0 0	L. Whitehead & Co., Ltd.	776 0 0
Rice & Son	847 0 0	H. O. Hilday & Greenwood	738 10 0
J. Smith & Son, Ltd.	845 0 0		
J. F. Ford	839 0 0	H. Groves, W. J. Coleman & Co.	812 2
Lathey Bros.	810 0 0	Greenwich*	712 0 0

LONDON.—For building a new police section house at Halham. Mr. J. Dixon Butler, Surveyor to the Metropolitan Police, New Scotland-yard, S.W., architect. Quantities by Messrs. Thurgood, Son, & Childrey, Consulting Surveyors, 143, Mount-view, High Barnet, N. W. Nash

W. Nash	£4,800	Lathey Bros.	£4,410
Grover & Sons	4,738	Stimpson & Co.	4,400
C. Ansell	4,616	H. Lovatt, Ltd.	4,400
H. J. Williams, Ltd.	4,612	Willmott & Son	4,344
Chessum & Son	4,603	Messon & Son	4,339
Holloway Bros.	4,593	Lasselles & Co.	4,329
Higgs & Hill	4,524		

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C. Wall, Ltd.	8,898	8,963	33
B. E. Nightingale	8,948	9,194	—
Higgs & Hill, Ltd.	8,984	9,225	10
Dove Bros.	9,045	9,315	—
Banyard & Son	9,185	9,550	35
W. King & Son	9,269	9,674	49
J. Smith & Sons, Ltd.	9,437	9,729	15
H. J. Williams, Ltd.	9,275	9,445	—
Foster Bros.	9,289	9,289	60
A. N. Gales	9,477	9,717	190
W. H. Lorber & Son	9,479	9,993	—
J. & M. Patrick	9,490	9,790	490
A. Hudson & Co.	9,520	9,595	20
Leslie & Co., Ltd.	9,621	9,878	36
G. H. & R. Roberts	9,779	10,009	29
J. Mowlem & Co., Ltd.	9,930	10,283	—
J. H. Kierulze & Sons	10,132	10,982	50
General Builders, Ltd	10,193	10,493	30
S. Rodhouse, sen.	10,330	10,150	50
T. Boyce	10,337	10,820	—
Martin Wells & Co., Ltd.	10,366	10,757	—

*Included in prices.

NEW MALDEN.—For making up Raby-road and north ends of Perith-road and Modern-road, for the Maldens and Coombe Urban District Council. Mr. T. B. Simmons, Engineer and Surveyor, New Malden:—

London & County Builders	£516 18 0	Free & Son	£480 0 0
Pry Bros.	513 0 0	S. Kavanagh & Co.	410 0 0
Forbes	505 13 6	F. Thacker	402 0 0
Wm. Adamson	483 0 0		
[Surveyor's estimate, £163 18s. 11d.]			

ORPINGTON.—For six pairs of semi-detached villa residences in High-street, Orpington, Kent. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C., and Orpington:—

London & County Builders	£170 0 0	Free & Son	£200
W. Gwen	£730	A. Pannett	£690

ORPINGTON.—For alterations and repairs to private residence. Mr. G. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C., and Orpington:—

R. A. Lowe	£210 0	St. Pierre Harris & Son	£195 5
T. Knight	197 0	H. Gasnapp	183 10

ORPINGTON.—For a pair of semi-detached villa residences in High-street, Orpington, Kent, for Mr. Davis. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C., and Orpington:—
A. Pannett* 1650

ORPINGTON.—For a pair of semi-detached cottages. Mr. St. Pierre Harris, architect:—
R. A. Love 699 0 | Smith 656 0
T. Knight 609 0 | A. Pannett* 539 13
Somersford & Son 560 0

PLAISTOW.—For underground sanitary convenience, New Barn-street, for the West Ham Borough Council:—
Doulton & Co. £2,403 0 0 W. Morley .. £1,482 7 0
A. W. Jagers 1,333 10 3 J. Parsons .. 1,477 0 0
K. Tabor 1,902 10 2 Chambers
Bro. 1,475 0 0
Sun 1,777 7 0 Foster Bros. .. 1,457 0 0
G. Jennings .. 1,718 10 0 E. E. Nightin-
gale 1,420 0 0
G. Wise 1,647 0 0 J. W. Jerram* 1,309 0 0
W. Manders .. 1,612 0 0 Shelbourne &
Gregor & Son 1,598 0 0 Co. 1,391 0 0
A. E. Sykes 1,550 0 0
Griffiths & Co. 1,535 0 5

RUGBY.—For constructing sewers and outfall works at Brinklow, for the Rural District Council. Mr. T. W. Willard, Surveyor, Rugby. Quantities by Surveyor:—
G. Law £1,200 0 0 F. Whitelock 850 0 0
Harrison & Co. 1,200 0 0 A. Jewell 800 0 0
T. Walker 1,097 0 0 Halloway 797 0 0
A. Palmer 1,044 0 0 Walton & Son 770 0 0
Sutherland & A. Holme .. 725 0 0
Thurpe 971 18 8 J. Young 700 0 0
—Wood 964 16 9 Hayscock &
Munichhead, Son 670 0 0
Gregg, & T. H. Cleaver 662 0 0
Mathews .. 912 2 5 J. Hollowell .. 645 0 0
T. H. Lymn .. 890 0 0 W. T. Duxbury
Langley, Har- & Brinklow .. 590 0 0
day, &
Johnson .. 885 10 3

SKIDNESS.—For improving and extending the sewerage and sewage disposal works, for the Urban District Council. Messrs. Elliott & Brown, engineers, Burton-buildings, Parliament-street, Nottingham:—
Birt & Co. £1,224 0 0 Johnson &
J. A. T. Binn 11,640 8 0 Langley .. £9,770 0 0
J. Wilson & C. Chamber-
Sons 10,682 10 9 lain 9,760 0 0
Parker & J. Jackson .. 9,458 0 0
Sharp 10,575 9 0 Bover Bros. 9,390 0 0
T. W. Trimm 10,447 0 0 Lechl, An-
G. Dunkley draws, &
& Son 10,250 0 0 Price 8,998 0 0
F. Pattinson 10,241 13 0 J. T. Turner
Barker Bros. 10,167 0 0 & Sons .. 8,990 0 0
Langley, G. M. Kerry
Hardy, & Co. 8,800 0 0
Johnson .. 10,143 5 0 H. E. Buck-
ley 8,731 3 0
W. H. Strick- J. S. Dan-
land & Co. 10,100 1 2 son, Os-
T. Smart .. 9,985 8 0 borne-rd.,
Langley & Blackpool* 8,558 1 3
Westmore- J. T. Short 8,351 11 7
land 9,961 0 0
R. H. Barry 9,425 0 0

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ham:—
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Co. £1,391 1 0 Ironworks
Cochrane & Co., Ltd. .. 1,348 19 4 Co., Ltd. .. £1,317 11 6
Staveley Coal Stanton Iron
& Ironworks works Co.,
Co., Ltd. .. 1,324 4 2 Lld., Stanton,
Sheepbridge near Notting-
Ironworks ham* 1,262 16 0
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Ltd., Nottingham* } specified in
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WALTON-ON-THAMES.—For 520 yds. of 9-in. stoneware pipe sewer, etc., in Sydney-road, for the Urban District Council. Mr. R. Willis, Engineer and Surveyor, Council Offices, Walton-on-Thames. Quantities by Engineer and Surveyor:—
A. C. Soan £299 15 0 | S. Atkins £246 10 0
S. Kavanagh 276 2 7 | E. Potterton
& Co., East 263 6 4 | Molesey* 216 0 0
C. Howell 257 3 4
G. Hebburn [Surveyor's estimate, £232.]

WANSTEAD.—For 1,420 ft. run of 12 in. by 6 in. Norwegian granite edge kerb, Blake Hall-rd., for the Urban District Council. Mr. F. H. Dreesey, Surveyor, Council Offices, Wanstead, N.E.:—
T. W. Marsh .. £178 5 10 | A. W. Porter £115 0 0
British Paving J. Jackson 113 0 0
& Granite Co. 178 0 0 Parsons & Par-
T. Adams 141 0 0 sons 113 0 0
W. Manders .. 142 0 0 W. & C. French,
Wilson, Barber, Buckburst
& Co. 133 0 0 | H.P. 110 0 0
W. Thomas .. 119 0 0 | W. Griffiths .. 107 0 0

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Godard & Son .. 3,730 Dorry 3,251
Minter 3,386 Hanson 3,234
Kingerlee 3,650 Knight* 3,103
Blackburn 3,592

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ILLUSTRATIONS.

The Bourse, Paris : Views Showing the Recent Additions.....	M. Cavel, Architect.
The Bourse, Paris : Interiors in the New Portion.....	M. Cavel, Architect.
Shipton Court, Oxon : as Restored.....	Messrs. Perkin and Bulmer, Architects.
Church of St. Christopher, Haslemere	Messrs. Spooner and Cobbold, Architects.
Memorial Church, Malvern Link	Mr. Walter J. Tapper, A.R.I.B.A., Architect.

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The Buildings of Elementary Schools.



In a recent issue, we briefly referred in a Note to the circular of the Anglesea County Council to the managers of non-provided elementary schools in regard to structural repairs and alterations.* The subject has already become more important, and it is desirable to refer to it at greater length than was possible within the compass of a Note:

Two facts should be referred to. The first is the action of the Education Committee of the London County Council and of the Council itself in this matter. Under the London Education Act 1903 the County Council is placed—as regards London—in much the same position as a country county council towards its district. By section 7 (d) of the Education Act 1902 the local authority, that is, the county or town council, shall in the case of what were called “voluntary” as opposed to Board schools, and are now called “non-provided” schools, require the managers “to make such alterations and improvements in the buildings as may be reasonably required.” If a dispute on this point arises, then the difference between the local authority and the managers is to be decided by the Board of Education in London. As an example of the increasing importance of this enactment, it may be mentioned

that a meeting was held last week at Durham to raise a sum of 25,000*l.*, part of a sum of 35,000*l.* which is required in order to put the non-provided or Church schools in the state demanded by the County Council of Durham. Still more important is the fact that the Education Committee of the London County Council has reported that twenty-nine non-provided schools are structurally deficient. The number of the non-provided schools in London is 508, and the Council has referred back the report in regard to the twenty-nine schools till the report as to the whole number is complete. The survey which was ordered by the Council was to be as to (1) lighting, (2) ventilation, (3) heating, (4) cloak accommodation, (5) lavatory accommodation, (6) teachers' rooms, (7) staircase accommodation and emergency exits, and (8) areas of playground.

It is unquestionable that reports in all these particulars should be made by skilled persons on behalf of every local authority. It is equally certain that the ratepayers will insist sooner or later on this being done. There is yet another point. We have in these columns over and over again insisted that the system of reports to the Education Department on the structure and sanitation of elementary schools by an inspector, whose main business is to examine the scholars, was useless and absurd. The report of the architect of the London County Council and that of the technical adviser of the Durham County Council, upon which—as we have already said—a demand for a large expenditure is based, clearly show

that the Board of Education has been lax in its duty. The duty of that department was, among other things, to take care that the buildings of elementary schools, kept up in a large measure by Government grants, were reasonably perfect. No one would require that school buildings should be elaborately equipped and magnificently built, but they should reach a good and proper structural and sanitary standard. The Education Department has already sanctioned the demands of the Durham County Council, thereby showing that that body only requires reasonable alterations and improvements, such as unquestionably should have been completed long before the Act of 1902 was passed.

It is certain that the health of the community will be largely increased by the sanitary improvement of elementary schools, so that from a non-educational point of view the present trend of affairs is welcome. But an improvement in the buildings of elementary schools may, we hope, tend to greater educational efficiency, and it should lead to an improvement in the buildings of secondary schools. One of the points for report by the architect of the London County Council was in regard to lighting. It would be interesting to see the result of a survey by this official of many of our private and public schools, for we feel pretty sure they would come in for a good deal of censure. It will be an absurd anomaly if the buildings of our elementary schools are brought up to a reasonable standard of efficiency whilst those of so-called higher schools are left in a less satisfactory state:

* See our issue for November 12.

But it will be no loss to the community if some of the private schools in which the children of the lower middle class are now educated come to an end in consequence not only of the provision of a reasonably perfect system of education in elementary schools, but of the provision of reasonably perfect elementary school buildings.

On the immediate question as to the policy of the London County Council in postponing action as to the twenty-nine schools until the report on the whole number is completed, so that the ratepayers of London may be impressed with the shortcomings of the managers of Church schools and appreciate the expenditure which will be required in order to find places for children for which the schools are now pronounced inadequate, it is only necessary to speak briefly. From a business and from an educational point of view, the moment a school building is reported unfit, then the improvements and alterations should be commenced as soon as possible. Every day's delay is the continuance of a state of things condemned by competent persons, and no excuse such as that put forward by the Council is of any value from an impartial point of view. Immense sums of money, it is clear, will have to be spent on school buildings all over England, and the sooner the work is put in hand the better.

THE CARE OF ANCIENT MONUMENTS.

By PROFESSOR BALDWIN BROWN:

I.

THE ancient monument is at present the centre of a considerable amount of activity, of which it is itself so sublimely unconscious. One wonders what the Great Pyramid or the trilithons of Stonehenge have thought of the various people who for different ends have been busy about them through the ages! They have been adored and then shamefully used, have been ransacked for treasure and exploited as quarries; have been measured and theorised over, and now again find themselves the objects of a new sort of cult not exactly religious, but of a pious and at times sentimental order. In our own land ancient monuments for the most part take care of themselves, or depend on the irregular assistance proffered from time to time by their private friends. Only in the case of a very few in Great Britain is the protection of the Ancient Monument Acts of 1882 and 1900 available, though in Ireland, as is usual with that much-persecuted country, the national monuments are far better treated. On the Continent every country, practically speaking, is supplied with official machinery for the protection of its monuments. These are made everywhere the object of the attentive scrutiny of inspectors and the deliberations of State-appointed Commissions, while in several countries there are formal Monument Acts, the number of which has been considerably augmented within the last few years.

It is the purpose of what follows to give in the briefest possible form an indication of what has recently been essayed in

monument administration both in our own and in foreign countries.

Monument administration, in the sense in which it is understood in Germany, Italy, or France is a somewhat extensive and complicated affair. The word monument means, of course, far more than is commonly understood by the term when applied, say, to the Nelson monument in Trafalgar-square or the Wellington monument in St. Paul's. It covers, roughly speaking, all old structures, and all the objects which we gather into museums like those at Bloomsbury or South Kensington. Quite recently the term has been somewhat arbitrarily extended to embrace natural scenes and objects, the preservation of which is of importance in the interest of the community. The draft of a Monument Law for the Grand Duchy of Baden in 1883 explains the term as including "all immovable and movable objects which have been handed down from a bygone period of civilisation, and as characteristic productions of their time have a special significance for the comprehension of art and art industry and their development, for the knowledge of antiquity and for historical investigation in general, as well as for keeping alive the remembrance of events of outstanding interest," while the Monument Law of the Grand Duchy of Hesse, which was passed in 1902, includes under the expression "Natural Monuments" "phenomena of the earth's surface, such as watercourses, rocks, trees, and the like, the maintenance of which is a matter of public interest on grounds of history or of natural history, or from considerations of the beauty or special character of a landscape."

All these objects, natural and artistic, through their interest, their beauty, or their associations, possess a value for the present to which testimony is given by the efforts made in so many quarters for their preservation: There is no space here to attempt to appraise this value or to discuss the reasons which make for protection. As a matter of general theory almost everyone will admit this value. Most people like the country, and are open to the impressions of beauty and sublimity from natural scenery, while few will deny that they are interested in a historic memorial or are sensible to the charm of a picturesque mediæval building. Unfortunately this vague general feeling is seldom effective for the defence of an ancient monument or a lovely site when attacked in the name of some modern improvement. It requires continual effort on the part of those fully alive to the value of this portion of the national assets to secure a proper balancing of the claims of the new with those of the old. If the importance of the preservation of the remaining specimens of our older town architecture were once firmly implanted in the public mind it would be found possible in very many cases to devise a way of meeting modern requirements, while yet preserving what is old. The two well-known churches in the Strand were repeatedly warned off that thoroughfare on the ground that they were hopelessly in the way, but the friends of monuments managed to save them from the spoiler, and we now behold them not only not in the way but the *foci* of a great architectural scheme,

and elements of the utmost value for the future effect of the whole neighbourhood.

The means that are taken to impress the value of ancient monuments on the general sense of the community are threefold. There is first the agency of private societies which stimulate and guide public opinion, and of individuals who write to the papers, interview local authorities, and ask questions in the House in defence of some threatened possession. There are next official agencies in the form of State-appointed Commissions served by a staff of inspectors and custodians, who bring Government influence to bear on monument problems though they may not be armed with direct legal authority; and, lastly, there is definite legislation, either in the form of State Monument Acts or in that of local by-laws affecting building in special towns or districts. Among ourselves private societies flourish, and by their influence on public opinion are the most potent agencies we possess for effecting the end in view. On the other hand, our Monument Act or Acts are very slight and ineffective, while we are absolutely without the elaborate official organisation of Monument Commissions in which continental countries are so rich. Abroad all three agencies are in active operation and their organisation and manner of working will now be briefly sketched.

The following European countries possess formal Monument Acts, that are here arranged in order of date: Greece 1834; Hungary, 1881; Great Britain and Ireland, 1882; Turkey, 1884; France 1887; Bulgaria, 1884; Roumania, 1892; Cantou de Vaud, 1898; Italy, the Grand Duchy of Hesse, Cantons of Bern and Neuchâtel, 1902. To this it should be added that other countries also, and these some of the most important in Europe have State Monument Acts at this moment under discussion. This is the case in Prussia, in the Austrian Empire in Bavaria, and also in Spain, while the Grand Duchy of Baden in 1883 and Greece in 1893 had drafts of new or amending Acts before their Parliaments.

This list of Monument Acts does not exhaust the efforts of Legislatures and Governments for the care of monuments for there exists in almost all European countries a mass of Royal and Ministerial decrees and circulars, and of resolutions of deliberative bodies which have the practical effects of law, and the majority of which establish official Commissions and Conservators for the care of monuments throughout the regions where the rescripts run. In fact, it conveys a false impression when it is said that one country possesses and another is without a Monument Law, with the implication that monuments are safer in the one country than in the other. Prussia has no Monument Act, though she has been talking of one for the past eighty years, yet there exists in the Prussian provinces a very full provision for the survey and upkeep of monuments, and there are no fewer than fourteen provincial and district Conservators in charge of the work with a General Conservator, under the Minister of Religion, Education, etc., at their head.

The Austrian Empire, again, has no monument legislation, but for the last fifty years the "Royal and Imperial

Central Commission for the Investigation and Maintenance of Artistic and Historical Monuments" has been at work. France had her "Commission des Monuments Historiques" for half a century previous to her Monument Act of 1887, and at this day Italy probably does more for the upkeep of her monuments through her provincial commissions, the "Uffici Regionali per la Conservazione dei Monumenti," than through the direct agency of her State Monument Act of 1902. Spain, Belgium, Holland, and Switzerland have their officially-appointed Monument Commissions, though they are without formal laws; Denmark and the other northern kingdoms attach the care of monuments to the administration of their great museums of the national antiquities.

The best sign of a healthy public feeling on this question in foreign countries is the existence of a large number of active private societies vowed to a holy war in the defence of the monumental legacy of the past against modern vandalism. These private societies have always flourished greatly in our own country, and we have, indeed, set the fashion in them to our neighbours over the sea. The Society for the Protection of Ancient Buildings, for example, which has about it for the foreigner the glamour of the name of William Morris, has a reputation abroad which it hardly enjoys in certain architectural circles at home. This last fact, it needs hardly to be said, is not wholly to its discredit. The example we have set is now being followed abroad by the foundation of new protective societies, on which a word will be said later on. Over and above these more or less polemical associations there are, of course, both at home and abroad, the established antiquarian and architectural societies, the members of which may be trusted to make their influence felt in favour of monument preservation. France is particularly rich in local societies of the kind, some of the most important of which owe their inception to the energy of Arceise de Caumont. Germany has a general association of local antiquarian societies, and these constituent bodies number no fewer than 161.

It is sometimes imagined that in matters like the care of our monumental legacy from the past the foreigner places his trust in official machinery, while in our own country we depend rather upon the free action of public opinion. This may have been the case to some extent in the past, though de Caumont, who in the thirties did so much to create the modern intelligent interest in mediæval art, was not in the official ring; but in the present day, in all the more progressive European countries, there is great personal activity shown in the founding of societies with a national or a local scope, and in outspoken criticism of official "restorers" and of bureaucratic methods of monument administration in general. Special organs of this movement exist in the foreign Press. Thus in 1887, the year of the passing of the French Monument Act, M. Charles Normand, an indefatigable champion of monuments, founded a "Comité des Monuments Français" with its organ, the periodical entitled *L'Ami des Monuments*, which announces itself as "founded

with the aim of watching over the monuments of art of France and the general appearance of her towns, and of defending the picturesque and the beautiful." A German periodical founded more recently in the same interests is of greater general value as giving a wider outlook on the whole field of monument administration in every civilised land. The periodical in question is called *Die Denkmalpflege*—"The Care of Monuments," and was started in 1899*, as the organ of a movement for the defence of the older monuments of the Fatherland which sprang up about that time. A league called "Heimatschütz"—"The Defence of Home," recently founded, carries out the propaganda to which the periodical gives literary expression. In Belgium a national society of somewhat similar aim was established in 1894 under the name "L'Œuvre Nationale Belge," or "L'Œuvre Nationale de l'Art Appliqué à la Rue," the main object of which was to improve the artistic character of new work, both in buildings, and in details such as electric light standards, shop signs, or the like; but its influence extends also to the preservation of excellent work handed down from the past. There is also a "Société Nationale pour la Protection des Sites et des Monuments en Belgique," which breaks a lance sometimes with the official "Commission Royale des Monuments."

These societies of national aims correspond to our own useful "National Trust for Places of Historic Interest and Natural Beauty." Their activities are supplemented by provincial and urban societies of narrower scope but of effective energy. Vienna has her "Association for the Protection and Maintenance of the Artistic Monuments of Vienna and Lower Austria." In France in 1897 there was formed in the Prefecture of the Seine a "Commission du Vieux-Paris," the object of which is "to search out the vestiges of the older city, to record their present condition, and, as far as practicable, to supervise their maintenance." A "Commission Municipale du Vieux-Lyon" was formed in 1898 on the lines of that of Paris, and in 1903 there was published at Lyons an illustrated *Inventaire Général du Vieux-Lyon*, which contains a list of existing houses possessing a value from the point of view of Lyonnaise history and art.† There is also at Rouen a "Société des Amis des Monuments Rouennais." In Belgium an energetic local "Société pour la Protection des Sites et des Monuments de la Province de Namur" has lately sprung into existence, and will probably lead to the foundation of other associations of the same kind. In Italy there is the same awakening of personal interest in the protection of the national heirlooms, which is the best and healthiest form which the movement for the care of monuments can take. In various towns of the Peninsula societies are formed by "Amici dei Monumenti," the object of which is to watch carefully the official proceedings of the Government authorities who deal with monuments, and to

* As an offshoot from the *Centralblatt der Bauverwaltung*. It is published by Ernst und Sohn, Berlin, and only costs \$8 per annum.

† It is worth notice, as an encouraging sign of the times in our own country, that a proposal is now under consideration by the municipal authorities of Edinburgh for making an inventory of the older domestic buildings of that city, as a preliminary to possible measures of protection.

keep the public interested in the subject through the medium of the Press. The "Riunione Artistica," of Perugia, recently formed a special committee of its members for this purpose. In Rome the "Associazione Artistica fra i Cultori di Architettura," now presided over by Signor M. E. Cannizzaro, has been doing good work in a city that needs intelligent treatment more than perhaps any other.

It is in Germany, however, that the personal movement for the care of monuments, as distinct from State and official agencies, is most apparent. Up till a few years ago Germany was in this respect somewhat in the background. There was plenty of official machinery for the protection of monuments, but the public in general had not taken up the subject. It has been the custom in Germany for a General Congress of Historical and Artistic Societies to be held yearly. The Congress of 1899, which met at Strassburg, took up the monument question, and passed certain resolutions, signed by representatives of 124 societies, in which the interest already shown by governments in these memorials of the past greatness of the people was acknowledged, but a demand was made for increased attention to what was termed "a question of life and death for the historical sciences and for the maintenance of the national consciousness." From that date a yearly congress, exclusively for the discussion of monument questions, has been held in different parts of Germany, and the various aspects of these questions have received the systematic treatment for which our neighbours across the North Sea are famous. The Ministers of the German States have sent delegates to these congresses, and some of the leading architects and antiquaries of the country have taken part in the proceedings. The verbatim reports of these, which have been published under Government subsidies, make the most interesting body of reading available on monument administration generally.

No principle is more insisted on in these discussions than the need for basing the movement for the care of monuments on the public will. Laws and commissions, it is pointed out, can only be really effective if they represent the genuine wishes of the community. The idea is to work from below upwards, and to build up a solid conviction of the real value of this part of the national assets by influences brought to bear on the public in general and especially on the young. This view has been well expressed by a Prussian jurist, Dr. Bredt, in a small brochure that is one of the best things written on the care of monuments in our own time.* He warns his readers against reliance on laws and regulations, and especially on the weapon of compulsory purchase or expropriation, which can, however, be held in reserve against the obdurate proprietor who insists on maltreating a monument of public value that happens to be on private land. The true method of monument protection, he points out, is the instruction of the public. Popular articles in the daily journals, free public lectures, lessons to the children in the schools, and visits with them to

* *Die Denkmalpflege und ihre Gestaltung in Preussen*. Berlin, 1904.

interesting buildings and to museums, are all means to this end; and a suggestion is made that a small illustrated home-guide should be prepared in every ancient city for distribution in schools. In this way, he argues, will the interest in the preservation of monuments, now confined to a limited circle, pass into the flesh and blood of the rising generation.

NOTES.

Architects' Drawings. WE are glad to be able to announce that the Council of the Institute of Architects have resolved to devote a sum of not more than 100*l.* from their funds towards upholding the appeal in the case of *Gibbon v. Pease*. But we must press on the Council the consideration that the many architects in this country whose subscriptions form the bulk of the income of the Institute, and whose interests the Institute is supposed to represent, will not be satisfied with the mere pecuniary support of a case in which the interests and the honour of the whole profession are concerned. They will expect that the Institute, through its newly elected body the "Board of Defence," should take an active part in supporting the just claims of the architects, and in representing what is the true function of architectural drawings, which the law has hitherto misunderstood, through not having it clearly and logically stated. What we have to show is that the existing law (as now construed) is an injustice based upon a mistake, and subscribers to the Institute have a right to expect that the Institute should do all in its power to bring this properly before whatever tribunal is ultimately appealed to. If it fails in this, the question will naturally be asked—what is the use of a "Board of Defence" which does not defend?

Technical Education. ALL who are interested in this important subject will do well to notice the comments made by Sir William White at the recent prize distribution of the Sir John Cass Institute. Although admitting that our friends in the United States and Canada had a good deal to teach us, the speaker expressed the comforting opinion that our best systems of instruction were fully equal to the best in America and on the Continent. This favourable condition, he thought, was less generally evidenced lower down in the scale; but, as a set-off, our system of evening classes was described as being far in advance of anything attempted elsewhere. It is very satisfactory to observe this eulogium of the valuable work done by polytechnics and kindred institutions, which undoubtedly confer inestimable benefits upon the working classes and others who have no time for study during the day.

"Owners" under the London Building Act. THE case of *Ori v. Payton* (*Times*, December 3) refers to the London Building Act, 1894, and although the actual decision turned upon the question of costs, an important point seems incidentally to have been decided. The plaintiff and defendant at an auction had become lessees from the County Council of two adjoining lots held under building conditions, upon the terms that leases should

be granted and that until the granting of the said leases the lessees should be deemed to be tenants at will, and the conditions also gave the lessees power to excavate for the purpose of the building. The plaintiff had erected a party wall on the line of junction between the two plots, having served the defendant with notice under the London Building Act, 1894. The action was brought by the plaintiff claiming that the defendant had trespassed upon the party wall, and was utilising it for his own purposes. During the pendency of the action an arbitration had been held, and the arbitrator had awarded the plaintiff a sum as the defendant's share of erecting the wall, which sum had been paid by the defendant, but on a motion as to who should pay the costs of the proceedings, the rights of the parties had to be considered. It was contended that the plaintiff was an "owner" within the meaning of section 5, sub-section 29 of the London Building Act, 1894, "a person in possession or receipt either of the whole or any part of the rents and profits of any land or tenement or in the occupation of any land or tenement otherwise than as a tenant from year to year or any less term, or as a tenant at will." It was argued that the plaintiff was not a tenant at will, owing to his rights under the conditions which enabled him to take away sand and gravel and commit legal "waste," but the Court dismissed these inferences, and held that the plaintiff had specifically agreed to be a tenant at will, and that therefore he had no rights as "owner" under the London Building Act, and he was condemned in costs. It will be remembered that it has already been decided in the case in *re Stone v. Hastie* (see our note "Rights over Party Walls," the *Builder*, October 31, 1903), that the provisions of the London Building Act charging an adjoining owner with a proportion of expenses in respect of extra user of a party wall only apply to the owner of the premises.

Sea Erosion in North Wales.

THE storms which caused so much injury to the Dee embankment, between Holywell and Mostyn, were also responsible for serious damage in the neighbourhood of Rhyll, about ten miles further along the coast. It appears that a portion of the promenade extension has been undermined by the action of the sea, but fortunately this can be made good at a comparatively small cost. A more serious condition is evidenced at the eastern end of the town, and it seems not improbable that a few more storms might render the lower parts of Rhyll liable to inundation. In the direction of Prestatyn—a village about four miles to the east of Rhyll—the sea has encroached for a distance of quite 140 yds. within the last thirty-three years, the rate since 1898 having been between 6 and 7 yds. per annum. Unless effective measures are taken without delay it is morally certain that the town will suffer considerably. However, as elsewhere, the local authorities appear to think the question is too large for individual action, and in the present juncture the only decision made is that the London and North-Western Railway Company shall be invited to join with the Urban District Council in the construction of defensive works. On this particular part of the

coast the railway line is in far less danger than the town of Rhyll, and it is scarcely reasonable to expect the company—which was established more for the earning of dividends than as a quasi-statutory department of public works—to expend capital in protecting the property of the ratepayers. Unless the Urban District Council want to see a portion of the town swamped, or perhaps washed away, they had better face the situation in a self-reliant spirit, and begin protective work before more damage is done.

The Embankment Roadway.

FOR years past the wretched condition of the roadway of the Victoria Embankment has been a reproach to London. Although comparatively little used, the macadam surface has to be re-made every year at great cost to the ratepayers, and very soon regains its normal character, one of the worst roadways in London. Being in a central position, this thoroughfare necessarily attracts more attention than other highways of similar construction in outlying districts. It serves, however, to point the moral that the modern perversion of Macadam's system is quite unsuitable for urban traffic. The essential feature of the true macadam roadway is that the small angular fragments of stone used become compacted, without other material, into a mass nearly impenetrable by water and wearing evenly throughout. In the present day the size of 1-in. cubical stone fragments recommended by Macadam has been increased up to 2½ in. or more, with the result that a so-called binding material is necessary for filling up the interstices. This "binding material" is really embryonic mud or dust, while the friction of the large stones or gravel against another furnishes the material for further supplies of mud or dust. Moreover, the effect of unnecessarily large stones in some parts of a roadway is to cause bumping, which leads to general disorganisation of the surface. Unless the road authorities of the London County Council are prepared to conform with the essential requirement of Macadam's system, it would be far better to pave the Victoria Embankment with wood or asphalt, and thus to get rid of standing reflection upon their capacity.

The Pennsylvania Railroad and New York.

AN engineering project of New York of far greater magnitude than the Rapid Transit Subway is now being executed by the Pennsylvania Railroad Company. At present the terminus of this railway is the premier line of the United States in New Jersey, and passengers can only reach New York by means of ferry boats crossing the Hudson River. The inconvenience of this method of access has been felt for a long time, and thirty years ago an abortive attempt was made to connect the two shores of New York Harbour by means of a tunnel. In March last the previously abandoned works were completed by the Pennsylvania Railroad Company, and a second tunnel is now in course of construction to provide adequate accommodation for traffic. The method of tunnelling adopted is to form a hydraulic shield through the silt forming the bed of the river, and so great is the power applied that the soft material can be pushed aside without involv-

its entrance to, and removal from, the interior of the tube. When the Hudson River tunnels have been finished, the railway company will be in a position to establish a great terminus in the centre of New York City. This station, with an area of 27 acres, will be situated about 50 ft. below the street level, and a part of the site above it will be occupied by the new United States Post Office buildings. A second pair of tunnels will be carried below the East River on the opposite side of Manhattan Island, coming to the surface at Long Island City. By the completion of this undertaking connexion will be afforded between the Pennsylvania and the New York, New Haven, and Hartford Railways, thus making direct communication possible between New England and the West or South, and effecting a most marked improvement in the traffic conditions of New York itself. Moreover, it is suggested that a further result may be the establishment of a harbour for Transatlantic steamers on the Long Island shore, thereby rendering unnecessary the present tedious navigation of the channel past Sandy Hook and up New York Bay. Thus some place near Long Island city may ultimately become to New York what Tilbury is to London.

Magnetic Testing. An important paper on magnetic testing was read to the Institution of Electrical Engineers this week by Mr. G. F. C. Searle, lecturer in physics to Cambridge University. This paper will be a great help to all who have to test the magnetic qualities of iron. Many of the difficulties which are met with in practical work have been cleared up. It was well known, for example, that the results of magnetic tests depended to a considerable extent on the previous magnetic history of the iron. So far as we know, however, Mr. Searle is the first to publish detailed tests showing exactly how the magnetic properties of the iron depend on the previous magnetising forces to which it has been subjected. Mr. Albert Campbell, of the National Physical Laboratory, had anticipated some of Mr. Searle's discoveries, and it is very satisfactory to find in an appendix to the paper that their results are in such close agreement. It is only with virgin iron that very anomalous results are obtained. If the iron be magnetised and demagnetised about fifty times, then perfectly consistent results are obtained, and these results are those which are required in practice. The author found that any mechanical operation considerably affected the magnetic qualities of the iron. He also found that strips cut from the same sheet of transformer iron differed considerably amongst themselves. In order to avoid the very considerable labour involved in winding coils of insulated wire on the samples of iron which have to be tested, the author has devised a magnetic testing square which ought to prove of great use to electricians. We were particularly struck by the method of applying corrections for the demagnetising effects produced by the magnetic lines which leak from the samples under test. Such a correction could only have been applied by a physicist who was also in the

front rank of mathematicians. The paper is practically non-mathematical, and so can be easily understood by any electrician. The Institution of Electrical Engineers is to be congratulated on its new departure of welcoming papers by non-members, and Mr. Searle's paper will considerably add to the value of this year's *Journal*.

The Leicester Gallery. At the Leicester Gallery is a collection of beautiful water-colour drawings by Mr. W. L. Wyllie, under the title "The Highway of many nations," signifying (as may he supposed) the Thames, long a favourite subject with Mr. Wyllie. In such a set of drawings the opportunity is given for combining landscape effect with the learned and satisfactory treatment of shipping in which Mr. Wyllie has no rival except Mr. Somerscales. One or two of the drawings, notably "The Warspite and Arethusa Training ships" (29), are admirable studies of old men-of-war. In most of the drawings, however, the ships are only an addition to a general landscape effect. How well Mr. Wyllie paints water, river or sea, we all know; but in this exhibition we were also attracted by another point of excellence, viz., the great beauty, variety, and truthfulness of the sky treatment in the various drawings, which is quite as worth note as any other quality in the drawings, and has perhaps been rather overlooked on account of the artist's special reputation as a marine painter. Among the works exhibited we may specially mention "Limehouse, a bit of vanishing London" (10), showing the curious tumble-down buildings along the wharf; "Rotherhithe" (15); "Greenhithe—brisk east wind" (32), a capital sea; "A Tide Rip in the Lower Hope" (47); "Barge Race on the Thames" (52); "St. Mary's Marsh" (62), with a group of barges in the foreground; and "Sea Reach" (68). The exhibition includes also two large architectural subjects, "The Houses of Parliament" (belonging to Sir J. Wolfe Barry) and "St. Paul's from Blackfriars Bridge" (40). The columns under the dome are a little too thin in proportion, but in general this is one of the best representations of St. Paul's from a painter that we have seen—well-balanced, in true perspective, and the character and outline of the western towers well preserved. In another room at the same gallery is a collection of XVIIIth century "Humorous Mezzotints," mostly of a very coarse species of humour and of little artistic value, though they are of interest as showing what sort of thing served to amuse English people one hundred and fifty years ago.

Sketches at Home and Abroad. UNDER this title Mrs. Mary F. Raphael exhibits at Mr. Maclean's gallery a pleasing collection of small oil-paintings of scenery, chiefly at Montreuil and the adjoining country. In a broad and sketchy style these show a great deal of talent and fine landscape effect. "From the Bastions, Montreuil-sur-mer," with its masses of white cumulus clouds on the horizon, is particularly effective; and there are a number of other small

landscape studies from the same district which have much merit. A larger and more finished work, "A Church-yard Idyll," also claims attention.

TRAMWAY RUNNING POWERS.

IN a paper read last week before the Tramways and Light Railways Association Mr. Sellon presented some interesting facts relative to running powers over tramway systems. It should be borne in mind that "running powers" differ from "facilities," in the respect that the former provide for the cars of one authority to run over the lines of another authority, while the latter merely amount to an arrangement for the issue of through tickets with a change from one car to another at the point of junction. The principles regulating running powers are fairly established in connexion with railway legislation, and, although numerous examples can be quoted of tramway running powers in London as well as in various provincial urban districts, there is still a very strong prejudice against facilities which are so obviously to the advantage of the travelling public. As claimed by Mr. Sellon, the elementary principles of English highway law apply to tramway politics in the respect that a tramway is an improvement of the highway on which it is laid, increasing its capacity, cheapening its use, and saving the expenditure of time and strength by the traveller. Consequently, those to whom Parliament entrusts tramway powers hold substantially the same position towards the public as highway authorities, so far as their powers extend, and they are equally obliged to afford all travellers the maximum facilities within their capacity. The public and local advantages of a tramway should not be limited by unreasonable conduct due to sentimental, selfish, or capricious motives. An example of the unreasonable objections frequently entertained is to be found in the petition seriously presented to Parliament in the session of 1904 against the request of the Tyneside Company for running powers over the tramways of the Newcastle Corporation. The chief plea then put forward was, that the proposals in the company's Bill were objectionable, retrograde, and against the public interest by reason, among other things, of their interference with the principles of municipal self-government. Fortunately the Tyneside-Newcastle running powers were obtained, and the result has been a large increase of tramway traffic. To illustrate the disastrous effect of an interrupted service the Edinburgh and Leith tramway systems may be instanced. The break between these occurred at Pilrig when the Edinburgh section of the line was converted to cable traction, and the consequent loss has been estimated at fully 6,000*l.* per annum, equivalent in this case to 4,000*l.* per mile per annum. The foregoing are two instances quoted by Mr. Sellon, whose paper ought to have the useful effect of convincing tramway authorities that it is most desirable to co-operate one with another with the object of connecting important districts by through services free from irritating and unnecessary obstructions.

LETTER FROM PARIS.

DURING the Christmas and New Year's festivities at Paris the streets always become a kind of public fair, the Boulevards from the Madeleine to the Bastille especially, and the dealers vend their wares in temporary shops which form a great disfigurement to the streets. It was to provide for something better this year that the competition, already referred to in our pages, has been organised in one of the rooms of the offices of *Le Bâtimeur*, where designs are assembled which are intended to suggest a better and more artistic type of temporary structure for these occasions. The "Société du Nouveau Paris," which originated the idea, has in preparation a plan also for the transformation of the Palais Royal, which the inhabitants of the quarter have so long called for. The scheme includes the opening up of the Palace, if not on its four faces, at all events on its north and south sides. The gardens, which are nearly as they were a century ago, it is proposed to replant. In the quarter thus transformed it is thought that sites might be found for public institutions, etc., on the ground left vacant by the gradual and continuous emigration of business establishments from

this quarter. It may even afford an opportunity for relieving the Pavillon de Flore at the Tuileries of the offices of the Colonial Office, the presence of which in that place is a danger to the treasures of the Louvre.

A conflict has arisen between the Société Centrale des Architectes and the Municipality of Paris on the subject of the ancient Hôtel de Ville. It has been proposed to put a tablet commemorating the old building, and the Société Centrale prepared one in which, following the conclusions of M. Marius Vachon, they worded the inscription to the effect that the Hôtel de Ville of Boccador was demolished and replaced by that of Pierre Chambiges. The experts of the "Comité des Inscriptions Parisiennes" maintain, on the contrary, that Chambiges merely continued the work of Boccador, finished in 1628 by Guillaum. The question is rather futile, since in the conflagration of the building under the Commune all evidence that could be gathered from the work itself was destroyed. M. Ballu and Deperthes reproduced faithfully the old façade, which was at all events a charming piece of Renaissance architecture; and that is really all that can be said with certainty.

This same Committee of inscriptions has just affixed a tablet to the last city residence of Bossuet, a house now No. 46, Rue Ste. Anne.

At the Petit Palais last week was inaugurated the collection of works by the sculptor and ceramic artist Carriès, offered to the city of Paris by M. Haenschel. It consists of more than 300 works of great interest; among them are portrait busts of a large and powerful style, and a monumental gateway commissioned for her château, by the Princess de Montéaliard, and ornamented with quaint sculptures; there are also some curious experiments in ceramic work with metallic incrustations, etc. It is a remarkable collection of works to have been left by an artist who was cut off prematurely in the height of his career.

The Socialists of the Municipal Council, who are an even stronger and more intolerant body than are to be found in the State departments, are scandalised at the prominence of the great church on the hill of Montmartre, and have been actually demanding either that it should be demolished or that it should be turned to a secular use. It is not likely, however, that the necessary alteration in the law will be made; and failing that, they demand that there should be erected opposite to the church the statue of the Chevalier de la Barre, condemned and executed as a heretic under Louis XV. If the Government authorise this public homage, it is probable that they will unearth from the Magasins de Beaux-Arts at Auteuil a very poor statue of this victim of religious intolerance, by Emile Hébert, a sculptor of some talent, but whose work hardly merits this kind of prominence.

It does not appear that M. Besnard has any chance of the election to the post of Director of the Villa Medici; and that is all that one can be certain of at present. MM. Saint-Saëns and Barrias having both withdrawn their candidature, a new list has been presented, in which the name of M. Daumet, the eminent architect, occupies a prominent position. Whoever is ultimately appointed, it is understood that the new appointment is to be the occasion of a good many reforms in the administration of the Académie de France at Rome.

A committee has purchased Rodin's rather over-rated statue "Le Penseur," with the intention of presenting it to the City of Paris, the authorities of which, however, are by no means anxious for it and were not prepared with any site for it. However, it appears that the gift has now been accepted and the Place du Panthéon fixed upon as the site; the statue to be raised on a pedestal so as to cause it to stand out against the great bronze door of the Panthéon as a background. It is needless to add that there is little harmony of style between the statue and Soufflot's building, but that is a matter of little consequence to the Rodin-worshippers, who are still lamenting that the too-celebrated statue (?) of Balzac is not decorating some public place in Paris.

The lovers of Impressionism, which is now called "Art Moderne," will be gratified by the fact that the Government has authorised the exhibition at the Luxembourg of a collection of the works of Toulouse-Lautrec, to whose eccentric and disconcerting work attention has been drawn by the recently exhibited examples at Salon d'Automne.

The death is announced of the sculptor

Maurice Ferrary, a Professor at the Ecole des Beaux-Arts. This talented artist was a pupil of Cavellier. In 1875 he exhibited a statue of Narcissus at the Salon. In 1882 he obtained the Prix de Rome; he had medals at the Salons of 1879, 1886, and 1889, and a gold medal in the 1900 exhibition. At this year's Salon he exhibited a bronze statuette, *à étre perdue*, of St. Michael.

The death is also announced, at the age of 88, of Mr. C. Augustin Salleron, a member of the Société Centrale des Architectes, an architect of a good many buildings in Paris, of which the most important is the Mairie of the Twentieth arrondissement, in the Place Gambetta.

NOTES AND SKETCHES IN SOUTHERN ITALY.—V.

BARÌ.

BARÌ is an ancient city which has continued prosperous in modern times, and is the capital of a province and the most important commercial town in Apulia. Its 60,000 inhabitants live partly in the old town, which has narrow, tortuous streets and is very thickly populated, and partly in the new town, which is laid out in uninteresting quadrangles, in which the one object of interest is the Museum, housed in the Ateneo. It was a Greek colony, called by Strabo "Bapiov," by Pliny "Barium." Under Nero it was a Roman municipium. There is a tradition that the name comes from a pirate—Barione—who took the city at a very early date and destroyed it to build it larger. When excavations were being made for the later walls an ancient tumulus was found, which contained gigantic bones and military trappings with bronze medals bearing the ancient crest of the city—a Cupid shooting—which was thought to be Barione's tomb. It formed part of the Gothic kingdom, and was retaken by the Byzantines with the rest of the peninsula. It changed hands frequently, Saracens and Lombards disputing possession of it during the early mediæval period. In 690 it was taken by

Romuald Duke of Beneventum with Brindisi and Taranto, but in 726 Gregory II's mediation obtained its restoration. In 802 it was again taken by the Prince of Beneventum Sicard; and twenty-eight years later the Saracens relieved him of its government. St. Michael III. regained it for the Byzantine and its possession was contended for between Lombard and Greek and Greek and Saracen till the Norman grasped it with tenacious hand, though the Venetians held it for a short time after 1002, when they wrested it from the Saracens. In 1046 Count Humfred negotiated for it, and Robert Guiscard did the same in 1064, but negotiation proving fruitless, besieged it by land and water for three years, taking it in April, 1071. He was succeeded by his son Boemund, and it then became the uncle Roger's. Robert the Angevin gave it to his favourite, Amelio del Balzo, of the Provençal house of Les Baux, in 1324, and it remained a dukedom in the hands of his descendants till the middle of the XVth century. The Sforzas then had it, but soon gave it away, and in 1558 it was united with the kingdom of Naples.

The greatest misfortune which Bari has suffered was its destruction by William the Bastard in 1156 as a penalty for revolt, when it is recorded that the only building left standing was the Church of St. Nicholas. It then lay waste for eleven years. Earthquakes damaged the city seriously in 1254, 1267, and 1727. The earliest notice of a Bishop of Bari occurs in the VIIth century. It was, however, of sufficient importance for Urban II. to hold council or synod there in 1098; the Antipope Anacletus held one also in 1131, and other met under the presidency of the Archbishop Antonio Pulco (in 1564) and Ascanio Gesuald Patriarch of Constantinople (in 1628).

The site of the ancient walls towards the land is now occupied by tree-planted piazzas, at the angle of which stands the Prefecture. Opposite is the Teatro Piccini, and towards the sea is a garden in which is a statue of the compose



Fig. 1. East Window, Cathedral, Bari.



Fig. 2. Crypt of S. Nicola, Bari.

the rival of Gluck, who was a native of the city.

The strongest influence in the development of the various forms of art in Apulia was monastic. The Basilian monks, of whom there were as many as 1,000 in this part of Italy in 933, of course spread Byzantine feeling; and the Benedictines, who came a little later, continued the connexion with Constantinople as far as the art tradition went, though in other matters representing Latin influence, while also employing workmen from the north of Italy. The church at Bari was indeed tightly bound to Constantinople, the Catapan's residence there strengthening the political bonds. At Conversano there was a monastery in the VIIIth century, as also at Monopoli and Trani. The Benedictines were certainly established in Bari in 978, but there are no remains of so early a date. They cultivated good relations with the Greek governors, and prospered exceedingly. Mr. Carabellse says justly:—"They were agriculturists and artisans, artists, writers, politicians, and thinkers, like a new republic within the circle of which rich and poor, noble and plebeian entered without class distinction, bringing a precious dowry of power and activity into every relation of life and re-establishing civilisation and cosmopolitan thought. The land in which their house rose became a centre of action, extending itself to those surrounding with a wider circumference every day." They attached themselves to the Normans when they gained power, and thus became still more rich and powerful. When the body of S. Nicholas of Myra was brought to Bari in 1087, the relics were delivered over to the custody of the Benedictine Abbot Elias. The Order already possessed two churches dedicated to the saint, one in Bari and the other on the town of the port of Monopoli, rebuilt about 1054 by a Barese craftsman—Mele di Martino.

In documents of about this period other names of craftsmen appear:—"Lupo, magister, f. Ermeffid; Grisante, f. Guisoni; Mel, ferrario, f. Natali; Mel, patitaro, f. Forzalis"; and that of "proto magistro Melo di Simeone da Bari," who in 1073 built the church of S. Nicola da Monte. He also superintended the work which was going on at the cathedral which was commenced by Archbishop Bisanzio in 1027. From a Greek document of 1032, we know that it was originally dedicated to the Virgin Deipara of Mettizza, and that it had the baptistery separate from the church—a Byzantine detail, though common also to Romanesque churches. The crypt was commenced in 1034. The same workmen were employed (Byzantines) who had built the churches of S. Saviour and S. Prisco in Bari, neither of which exist now. Bisanzio was succeeded two years later by Nicola (1035-61), a true artist, who belonged to the most powerful family in the city; he was elected by the vote of the people, and continued the work at the cathedral, but the eastern façade is due to Archbishops Angelo and Rainaldo, the latter of whom built one of the flanking towers, the other being of the period of Archbishop Giovanni, who held office between the two. The apse is round, but the screen wall between the two flanking towers hides its shape. In this wall is the fine window illustrated, Fig. 1, an arrangement frequently met with in the neighbourhood. Over the crossing is a beautiful octagonal cupola, with a finely-carved frieze crowning an arcade on corbels which are mostly heads of men and animals. This was built in 1178 with the transepts, one of which has a splendid rose window; the carving is like the east window, and makes its date certain. The roof was originally flat, which is proved by the disregard of the slope of the present one for the little columns round the cupola, which take the place of

corbels at the angles, and at the second arch on each side. Some of the XIIIth century roof timbers have been preserved, still bearing their coloured decoration. The building was not completed in 1245. In that year Angelo da Cicoria was superintendent. There is a central nave and aisles with triforium, and the western façade is divided by two plaster strips answering to the nave and aisles in the Lombard fashion. There is a fine cornice to the façade, and a richly-carved hood mould follows the curve of the round window, and has figures of animals at the ends. The transepts and towers have double arcades, two smaller arches beneath a larger one, and the aisles are also arcaded, but with single arches. The nave has clearstory windows. The pilasters and arches beneath the matroneum or triforium simply butt against the transept walls, a proof that they are later; and the cornice also shows the original width of the façade. The arches were filled up about 1300 to make side chapels. None of this upper church can be older than 1156, the date of the destruction of the city by William the Bad. The sacristy is on the foundations of the ancient baptistery, and a wall has been found 9 ft. from the front wall of the transepts of similar construction to buildings in Steilly, with marble fragments carved with geometric interlacings and Arabic letters, which suggests the existence of a mosque here during the domination of the Saracens in the IXth century, who have left other relics, such as the tomb of a Sultan, preserved in the Museum. The floor of the cathedral is inlaid, and the central feature reproduces the design of the rose window of the principal façade. It is XIIIth century work, in which serpentine, porphyry, antique green, and red marbles are made use of. Of the ancient altars which were made by Romuald, archbishop in 1292, only one remains. The high altar was consecrated February 6, 1233, by Bernardo

Costa, Archbishop of Palermo, formerly of Bari. Frederick II. was probably present, as he was certainly at Bari eleven days before. It was made by Anseramo of Trani, but only fragments of it remain worked up by Alfano of Termoli in the XVth century. The ciborium is of the usual type, like that of S. Lorenzo fuori at Rome. It was consecrated in 1428 by Archbishop Francesco de Ajello. Some of the caps and the eagle from the ambo are preserved in the Museum. In 1745 great alterations were made, most evident in the interior and the western facade. At this time the lions from the west door were removed to the rocco courtyard of the archbishop's palace, where two stand upright by the stable door; two others crouch holding prey in their claws. The lower church or crypt has three rows of eight columns to support the vaulting and two at the arch of the apse. It was finished about 1178, and contains the relics of Angelarius, Bishop of Canosa, 845-68, in a marble sarcophagus, which were placed there in 1092. Those of S. Sabinus are also here, brought from Canosa in 1092 by Archbishop Elias. In the treasury is a very early Exultet roll (of the IXth century). Over the altar of S. Rocco is a picture by Tintoret, and opposite to it one by Paolo Veronese.

The church of S. Nicola, with its appurtenances, occupies the site of the dwelling of the Catapan, the imperial pretorian palace. There was a small Greek church dedicated to the saint at the beginning of the XIth century, which was almost attached to the palace, and had, in common with it, the great courtyard where the judges and imperial counts rendered justice and received public oaths. It is named in a document of 1048. When the relics of S. Nicholas were brought to Bari in 1087 Roger, son of Robert Guiscard, ceded the palace area to the Baresi, so that the sanctuary was free from episcopal jurisdiction, and the Benedictines immediately commenced to build a great church for them of which Abbot Elias was probably the architect. A large part of the material is Byzantine and Roman. In two years it was sufficiently finished for Urban II. to consecrate

it. He was holding a synod at Melfi, and, on his way to Brindisi to consecrate the new cathedral there, stopped at Bari and on September 30, 1089, installed the abbot in the new dignity. The next day the bones of S. Nicholas were laid in the crypt, which must be the part which had been completed. According to the anonymous chronicler of Bari, the synod of October, 1098, was held in the upper church, and the bishop's throne, now preserved in the treasury, was made by Abbot Elias for Pope Urban II. to occupy on that occasion; but it was not consecrated till 1197, when Conrad of Hildeheim, imperial chancellor to Henry VI., officiated. Some say that it was finished by King Roger in 1139, who was crowned here in 1131 with an iron crown by the Antipope Anacletus II., according to an inscription of the XVIIth century at the entrance, which, however, makes mistakes about two other coronations named in it. The principal door of the facade was made by Ansaldo and Taddeo, "maestri comacini," and the equally fine north door, called "of the lions," by a Greek or Apulian named Basilio in 1105. Another door recalls the design of the inner portion of that of S. Maria in Piazza, Ancona, with twisted sections and bosses between. The master mason's name was Angelo da Fiumarello. An inscription gives the name of another mason "Magister Blasius." Abbot Elias is buried in a XIIIth century sarcophagus near the southern flight of steps to the crypt. The upper church is mainly the work of his successor, Eustasius (1105-23). The crypt (Fig. 2) has three rows of eight columns each and two in the apse; twenty-two pilasters in the walls receive the arches of the vaulting which they support. There is a legend that one of the columns threatened to fall during the construction, and that S. Nicholas appeared and kept it upright. It is now marked by an iron cage for the veneration of the faithful and to protect it from relic-hunters. The columns are most of them antique, as are many of the caps, above which are enormous abaci, but there are no bases. The altar is of silver. One was made in the XIVth century for the Servian king Urosius by Ruggiero dall'

Invidia and Roberto da Barletta, but melted down in the XVIIth century by two Neapolitan silversmiths to afford material for the present one. From the tomb a fluid exudes known as "Manna di Bari" and thought to be miraculous.

The upper church (Fig. 3) has a nave and aisles, with a flat ceiling over the nave, carved, painted, and gilded, made by gifts of the Baresi, and vaulted aisles, above which is the matroneum. The nave arcade has double columns as at Trani in the three western bays, but the inner one seems an afterthought connected with the cross arches which were added by Francesco Sforza to strengthen the structure against earthquake. His arms are on the first one. The choir screen is original as far as its construction goes, but in the XVIIth century details of that period were added. The capitals resemble those at Cefalù. On one side of the entrance to the choir is a seat for the king, as at Monreale and Cefalù. The high altar was erected by Abbot Eustasius, as an inscription on the step says. The ciborium above it has the colonnettes above the architrave and the octagonal top which are seen at the cathedral. If this is contemporary with the altar (as is believed), it is the earliest example of the kind, that at S. Lorenzo fuori, Rome, being dated 1148. On the front of the architrave is a metal plate representing King Roger crowned by S. Nicholas, which is said by some to be niello in various colours (as in the bronze doors of the period) and by others to be enamel. M. Bertaux claims it as Limoges work of the middle of the XIIth century. The costume of the king is much like that of the mosaic at La Martorana, Palermo, but I was not able to examine it closely owing to the numbers of tapers placed all round the upper part of the ciborium in preparation for Easter. Behind it is the tomb of Bona Sforza, Queen of Sigismund I. of Poland and last Duchess of Bari, who died in 1558, and a small portion of the mosaic pavement remains. In a chapel to the right, the chapel of S. Martin, is a Madonna with saints by Bartolomeo Vivarini (1476), a lunette is above with Christ and SS. Nicholas and Francis. The north aisle contains the tomb-

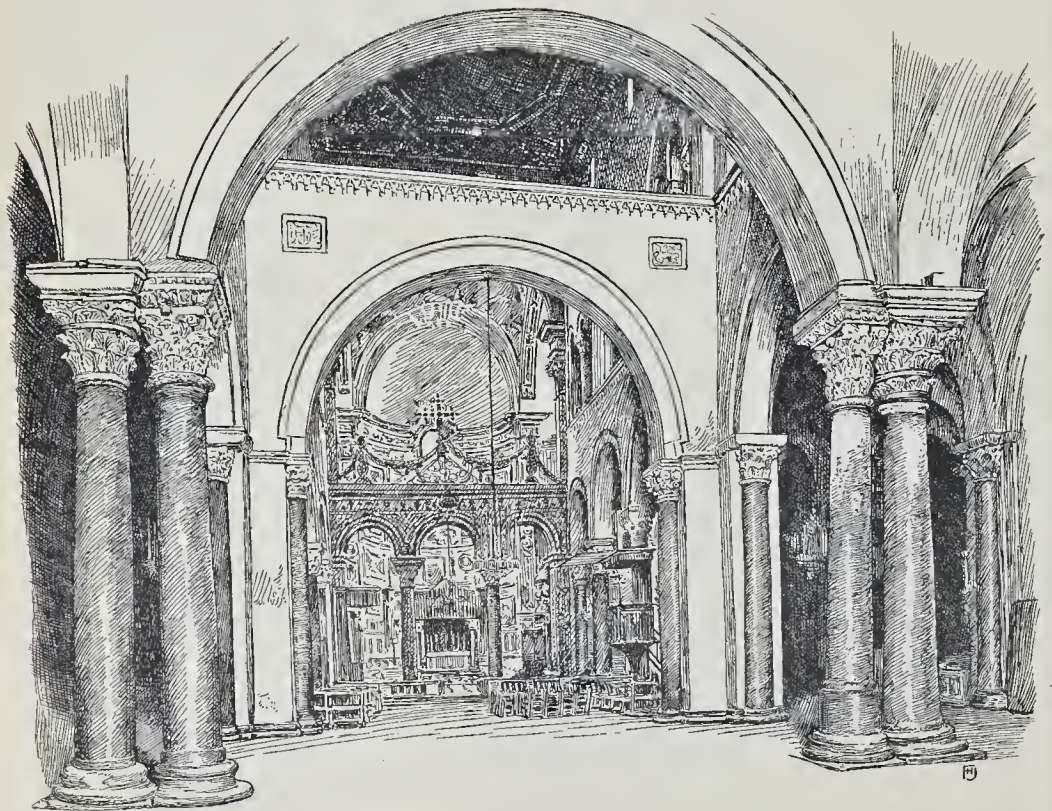


Fig. 3. Upper Church, S. Nicola, Bari.

stone of Robert, Count of Bari, protonotary of Charles of Anjou, who conducted the judicial murder of Conradin, the last of the Hohenstaufen, and was therefore slain on the spot by an indignant noble. The capitals of the columns of the matroneum (which resembles that at Trani) are many of them finely carved. Some columns have bases, some are without them, and some have been lengthened by the addition of small sections. At the end on the south a little two-light window looks into the transept. The base of the central colonnette is formed of an Early Byzantine cap turned upside down. The façade is divided by pilaster strips in the Lombard manner, but resting on columns at the bottom, and the walls have the usual arcades supported on corbels. The central door is flanked by columns, which support a frieze; above it is another arch with a figure of the patron saint in the tympanum and a pedimental termination. The arcading springs from this and the pilaster strips. Above the side doors is a similar arch, with two smaller beneath springing from a corbel above the centre of the door. The central gable has a moulded circular sinking at the top, and below that are three two-light windows, one above and two below, and the aisle walls were also pierced by smaller similar windows, now built up, which hug the pilaster strips in a curious manner. Encausted in the walls are tombstones of noble families of Bari and of Byzantine pilgrims who died here. The treasury contains an illuminated breviary of Charles II. of Anjou and his sceptre, and an iron crown said to have been made at Bari in 1131 for King Roger; also many pieces of goldsmiths' work, and Abbot Elias' marble seat, which bears on its sides the following inscription:—

"Inclitus atque bonus sedet hac in sede patrouus
Presul Barinus helias et Cansinus."

The seat is supported on two crouching figures. The central one has a pointed cap, and supports the seat with his shoulder and keeps himself up with a club. At the back it rests on octagonal pillars and on a lion which holds a man's head in his claws. The footstool has two crouching lions. The ornament of the side has suffered a good deal, the panels are pierced. On the front are different animals in crouching figures set diagonally. The crouching figures occur continually in architectural sculpture of the period; this is, perhaps, the earliest example. The entrances to the courtyard have pointed arches and are mediæval. The principal one has a figure of S. Nicholas above, with shields of Angevin arms at each side. Below are those of Raimondello Orsini (a rose and three bars), who died in 1405, and a blank shield. It was probably built under Giovanni I. of Anjou.

Close by is the little church of S. Gregorio, said to be the oldest church in the city. The façade has a central door, then three round-headed windows, each surrounded by a band of ornament and with pierced tympana; above them is a large pointed arch, within which is a square-headed opening; below this opening is a little arcade of four arches on colonnettes in couples with pierced tympana, and an ornamented band which returns down a gap in the middle. Four bracket corbels project on each side, and six more in pyramidal form round the arch, three on one side and two on the other with one at the summit; they are carved with heads and beasts. The whole is enclosed between two pilaster strips with square, moulded tops and a gable. At each side is one little window, and then similar pilaster strips to the height of the roof slope of the aisles. The nave arcade has stilted, round arches, two groups of three on two columns, with a pier between and half columns at the end of each group. There are three shallow apses, of which the centre one is larger, and a clearstory of three little windows on each side at unequal intervals. The pierced slabs of the windows (like those in the cathedral transepts) and the general conception show Oriental influence, though several of the characteristic Apulian details appear here thus early. The church of S. Marco was founded by the Venetians in the XIIIth century.

King Roger built a castle at Bari in 1131, employing Mussulman workmen. It was on the site of an older work, and one tower which still exists was raised on an earlier wall. The north-east angle is the oldest part, and is probably Romano-Greek, Sig. Avena says. It is built of large local stones without cement, and was restored by Frederick II. between 1233 and 1240. The archivolt of the west door and some caps show excellent carving. The eagle on it shows that it is of Frederick's time. Just

beyond this door is a portico, on one of the abaci of which the name of Mele da Stigliano appears, while another is signed by Finarro da Canosa. Three large two-light windows on the north are Angevin work. The fortifications were strengthened by Isabel of Aragon and her daughter Bona, and bastions were added by the Bourbons. It is now a prison and caserne.

In the Piazza Mercantile is a much-worn lion on a kind of seat pedestal with the inscription "Custos justitiæ" on its collar. It was the heraldic cognisance of Bari. In S. Scolastica is a Romanesque fountain inscribed "Ursus laborator hujus fontis." In the narrow and winding streets one every now and then comes across a balcony of wrought iron, late in style, but effective, or a delicate two-light window with slender shaft, and the little shops are generally delightfully picturesque, niched into queer corners, or with much of their wares displayed outside in the street. The Museum contains a large collection of South Italian vases, a beautiful silver dish with heads in high relief, found at Taranto, architectural fragments of various dates, and photographs of interesting buildings in the surrounding country, the "Terra di Bari," which may be of assistance to the traveller who has not planned his tour completely as indicating places desirable to visit.

F. H. J.

[In No. 2 of this series it was mentioned that the cope stolen from Ascoli had been discovered in the collection of Mr. J. Pierpont Morgan. It is with great pleasure that I observe that Mr. Pierpont Morgan, with a graceful generosity, has presented it to the Italian Government.]

THE INTERNATIONAL GAS EXHIBITION.

II.—HEAT AND POWER.

Industrial Uses of Gas.—The most novel exhibit in the exhibition at Earl's Court is a naked gas flame burning continuously while completely submerged in water. The air required for combustion is mixed with the gas before the gas passes to the burner, and the products of combustion rise through the water with a bubbling noise. Explosion, or "back-firing," of the inflammable mixture of gas and air is prevented by keeping the mixture under a sufficiently high pressure (1 lb. to the sq. inch), and by using a specially constructed burner. The fact that an unprotected gas flame can be maintained under water was announced some years ago by a foreign experimentalist, we forget by whom, but this is the first occasion upon which we have seen the discovery put to industrial use. The exhibit is made by the Smethurst Furnace and Ore Treatment Syndicate, Limited, who have applied it for evaporation and other purposes. The same exhibitors also have on view a furnace heated to an intensely high temperature by a mixture of gas and air under high pressure.

As manufacturers of gas-consuming workshop and general industrial appliances the firm of Fletcher, Russell, & Company stand alone, and the exhibit of the firm in this class of goods easily surpasses that of any other exhibitor. Here may be seen crucible furnaces, muffle furnaces, ladle furnaces, soldering-iron heaters, blow-pipes, glue-pots, smoothing irons, coffee-roasters, and a number of other utensils dependent upon gas as a source of heat. The ease with which high and low temperatures may be attained, and maintained without variation for any length of time, renders gas an ideal fuel for the heating of drying ovens and for many other industrial purposes.

Water Heaters.—All the principal manufacturers of gas water-heaters have exhibits, and they appear to have almost attained perfection in the art of rapidly transmitting heat from a gas flame to water without undue waste of heat. Boilers and water-heaters of many forms may be seen, but bath water-heaters are the most prominent of the exhibits of this class. There is now no difficulty in obtaining a bath water-heater which will heat water rapidly, at small cost, and without emitting an obnoxious odour. The best exhibits bear so close a resemblance to one another that it would be useless to attempt to discriminate between them so far as their general utility is concerned. Gas water-heaters of good make may be safely used in bath-rooms if the products of combustion are led into a flue which has a constant up-draught even when the water-heater is not in use, and if they do not emit an offensive odour

when in use. Emission of a stink is a danger signal. In selecting a water-beater care should be taken to choose one in which the flame does not remain in contact with a mass of cold metal, for such contact reduces the temperature of the gas flame, and results in the generation of the poisonous products of imperfect combustion.

A novelty in the form of a tubular boiler fitted on top of a gas cooker, and connected with an overhead water tank, is shown by J. Nutting. The boiler is in the form of a grid constructed of V-shaped tubes. Other boilers are placed at the bottom of the cooker. The object of these boilers is to utilise the heat which is usually lost when the cooker is at work, the water from the boilers being employed for washing crockery, etc. It is stated that these boilers are being fitted to the cookers employed on the Great Western corridor trains.

Excellent forms of water-heaters are shown by Ewart & Son, Ltd.; Maughan's Patent Geyser Co., Ltd.; Fenlon & Son; Richmond Gas Stove and Meter Co., Ltd.; and Fletcher, Russell, & Co., Ltd. A foreign exhibitor of water-heaters is Carl Flüge, of Hamburg.

Cookers.—From the smallest of grid burners to the mammoth cookers in which a tall man may stand upright, gas cooking appliances of all sizes and designs may be seen at the exhibition, but there are few striking novelties. The latest invention in cookers is probably the "Harris" grill, exhibited by A. E. Harris. This is a little oven which instead of having one row of small flames along each side of the bottom of the oven, has along its sides, from top to bottom, tier upon tier of small gas jets. The result is that food can be cooked in this grill much more rapidly than in an ordinary cooker. One would naturally expect that meat cooked in this way would be burnt on the outer surface and nearly raw in the centre. Impartial judges have, however, tasted food cooked in the Harris griller and declared it to be satisfactorily cooked throughout. J. Nutting exhibits a cooker in which the waste heat is utilised to heat water, but reference to this has been made under the head of water-heaters. Among the exhibitors of cookers are Cannon Iron Foundries, Ltd.; Carron Co.; the Davis Gas Stove Co., Ltd.; Fletcher, Russell, & Co., Ltd.; Imperial Stove Co.; R. & A. Main, Ltd.; Planet Foundry Co., Ltd.; Richmond Gas Stove and Meter Co., Ltd.; Wm. Sugg & Co., Ltd.; Wilsons & Mathiesons, Ltd.; and the Wright & Butler Lamp Manufacturing Co., Ltd.

Gas Fires and Stoves.—Although a great variety of these are exhibited they are too familiar to the general public to require description. A general improvement has of late years taken place in the design of many of these appliances, and in the form and composition of the ball "fuel" used. In our opinion the fires in which ball fuel is used are decidedly preferable to those provided with asbestos in strips or in bundles of short fibres. In selecting an "atmospheric" gas fire it is well to remember that the air-holes gradually get clogged with dust, and a fire so constructed that the burners can be readily handled and cleaned is more serviceable than one so constructed that it is difficult to get at the burners for cleaning. S. Clark & Co. exhibit several forms of their well-known "syphon" condensing stoves, and a number of firms show reflecting stoves of various designs. All the firms mentioned as exhibitors of cookers also exhibit gas fires and stoves.

Radiators.—Radiators in which circulating steam or hot water may be produced with the aid of gas are shown on several stands. Other gas-heated radiators are simply hot-air radiators. These radiators are very simple in construction, and are very compact. Among the exhibitors of radiators are Fenlon & Son; Cannon Iron Foundries, Ltd.; Ewart & Son, Ltd.; and the Davis Gas Stove Co., Ltd.

Gas Engines.—Gas engines are well represented. On entering the exhibition the "Stockport" engine, manufactured by J. E. H. Andrew & Co., and exhibited by Bilbie, Hobson, & Co., the London agents, is first encountered. Engines of 40 B.H.P., 25 B.H.P., and 1½ B.H.P. are shown. The National Gas Engine Co., Ltd., Crossley Brothers, Ltd., and W. Grice & Son, Ltd., also have engines erected in the Prince's Hall. Crossley Brothers, Ltd., exhibit a high speed 27½ B.H.P. engine for electric lighting, and this engine has been utilised for driving the dynamo which supplies current for the incandescent electric lamps with which the firm's stand is illuminated. In the Queen's Palace

annexe, P. Simon & Co. exhibit a "Capel" gas engine driving a dynamo which is providing current for a number of electric arc lamps. At first sight this array of electric arc lamps appears a strange exhibit for a gas exhibition, but the object of the exhibit is to show that a gas engine is the best agent for driving a dynamo. Gas engines are also exhibited by J. Firth Blakeley & Co., and Geo. Waller & Son.

Miscellaneous Exhibits.—Gas meters of all descriptions are exhibited by the principal meter manufacturers. A discount or check meter exhibited by the "Rotary" Meter Syndicate, Ltd., is a novelty. Scientific apparatus is shown by several firms. Wm. Sugg & Co., Ltd., exhibit photometers and apparatus used for testing the heating power and purity of gas. Townson & Mercer exhibit chemical apparatus. Siemens Brothers & Co., Ltd., exhibit a water pyrometer and an electrical resistance pyrometer. In the loan collection is a photometer for high-power lights lent by Mr. C. C. Carpenter. A device for lighting burners from a distance is shown by the Pneumatic Gas Lighting Co., and a clockwork arrangement for automatically lighting and extinguishing a gas burner at any desired hours of the day or night is shown by the Automatic Light Controlling Co., Ltd. Mechanical conveyors for coal or coke, machines for charging retorts, and appliances for purifying gas are shown by a number of engineering firms.

It has been impossible to list the exhibits now on view at Earl's Court, but from such notes as we have been able to publish it will be seen that many of the exhibits are of interest to all who are concerned with the lighting or heating of buildings, or with the lighting of open spaces.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE third general meeting (business and ordinary) of the present session of the Royal Institute of British Architects was held at No. 9, Conduit-street, Regent-street, on Monday, Mr. T. E. Collcutt, Vice-President, in the chair.

The minutes of the last meeting having been taken as read, the decease of the following members was announced, i.e., Mr. C. J. Ferguson, F.S.A., Associate, of Carlisle, and Mr. Francis W. Bedford, a Fellow and Ashpitel prizeman and Owen Jones student.

Elections.

The following gentlemen were then elected as members, i.e., as *Fellows*—Messrs. W. A. Aickman, Gresham-street, E.C.; S. N. Chandabhojy, Bombay; J. B. Chubb, Foundling Hospital, W.C.; B. J. Dicksee, New Kent-road, S.E.; W. Dunn, Lincoln's Inn Fields, W.C.; F. Emley, Johannesburg; A. C. Forrester, Old Queen-street, S.W.; A. L. Guy, Gray's Inn, W.C.; W. Leck, Johannesburg; E. C. P. Monson, Acton Vale, W.; H. A. Pelly, Old Broad-street, E.C.; E. Thornton, Calcutta; W. F. Young, Norfolk-street, Strand, W.C.; R. Watson, Lincoln's Inn Fields, W.C. As *Associates*—R. J. Allison, H.M. Office of Works, Westminster; E. G. Allen, Croydon; W. H. Bagot, Adelaide, South Australia; W. J. Ball, Creve; E. Bates, East Croydon; C. Batley, Kettering; W. E. A. Brown, Regent-street, S.W.; A. N. Campbell, Bloomsbury-square, W.C.; W. A. T. Carter, Wimbledon, S.W.; C. M. Childs, H.M. Office of Works; B. C. Chilwell, Wednesbury; C. B. Cleveland, Whitehall-place; N. Colley, Huddersfield; S. C. Curtis, Holborn, W.C.; W. T. Curtis, West Dulwich; W. J. Davies, Sidecup; A. H. Gloyne, Richmond; H. P. Gordon, Blomfield-street, E.C.; P. W. Hawkins, Westminster, S.W.; B. B. Hooper, Dunedin, New Zealand; V. Hooper, Redhill; P. C. Pilling, Bolton; K. D. S. Robinson, Westminster; G. A. Ross, Montreal, Canada; T. T. Sawday, Leicester; A. Scott, jun., Dennistoun, Glasgow; N. O. Searle, Paternoster House, E.C.; R. E. Stewardson, Pall Mall East, S.W.; F. E. Stratton, Theobald's-road, W.C.; P. J. Westwood, 130, Jernyn-street, S.W.; G. H. Widdows, Derby; F. Wilson, Sheffield. As *Honorary Associates*—Count Plunkett, B.L., F.S.A., M.R.I.A., Dublin.

It was announced that the following are the gentlemen who passed in the November examinations. One hundred and ninety-five candidates were admitted, and of these fifty-eight were exempted from sitting. The remaining 136 were examined, with the following results:—

The Preliminary Examination.

A. J. T. Abel, Fulham, S.W.; J. E. Adamson, Manningham, Bradford; A. G. W. Allen,

Roundhay, nr. Leeds; J. C. Anderson, Lee, S.E.; F. Bacon, jun., Battersea Park, S.W.; F. A. Baldwin, East Acton, W.; E. H. Ball, Dinnington Colliery, Dudley, R.S.O., Northumberland; C. D. Barber, Romford, Essex; T. C. Barker, Scarborough; V. S. Barnes, Carmarthen; H. Battiscombe, St. Mary Cray, Kent; W. Beswick, Chester; B. W. Billings, Farnham, Surrey; A. G. Blackford, Ealing, W.; C. V. H. Blackwell, Hulland-road, Derby; B. J. Boothroyd, Brockley, S.E.; J. E. Bowness, London; H. Bradley, Blackpool; H. E. Bunce, Clapton, N.E.; W. H. Burgum, Edgbaston, Birmingham; F. M. Burr, Hornsey Rise, N.; E. G. Catelapole, Ipswich; R. A. Chadwick, Blackpool; R. T. Chapman, Bolton; P. J. Clarke, Heswall, Cheshire; O. Coghlan, Cheltenham; E. S. Coldwell, Kensington, W.; F. W. Commin, Exeter; C. Cooke, Southend-on-Sea; G. V. Cooke, Eastbourne; C. J. M. Cowdell, Leicester; J. Crabtree, Blackpool; J. D. Crawford, Bishop Auckland, co. Durham; C. E. S. Davies, Hafody-Coed, Llanfairfechan, N. Wales; C. R. Davy, Maidenhead; A. H. L. Daw, Cardiff; H. A. Diekmann, Sherwood, Nottingham; G. Duncan, Rochdale; S. Edwards, Barnstaple; W. H. Elsdon, Dalston, N.E.; W. S. A. Emden, Hampstead, N.W.; C. G. Evans, Neath; F. Fernyhough, Didsbury, nr. Manchester; D. H. Fish, Chigwell School, Essex; H. S. Fleming, Moorlands, Bingley; G. H. Foggett, Ash Field, Yealton, nr. Leeds; O. Gaunt, Camden Town, N.W.; B. S. W. Gilbertson, W. Hartlepool; K. Glover, Wylam, R.S.O., Northumberland; W. Goodchild, Ipswich; G. D. G. Hake, London; H. W. Hallas, Huddersfield; J. C. Hardy, Nottingham; S. Harrison, Linthorpe, Middlesbrough; A. P. Hartnell, Bristol; J. S. Harvey, Clapham Common, S.W.; W. H. Hatchard-Smith, Epsom; C. D. Hawley, Ipswich; H. C. Haworth, Chorley; J. A. S. Haworth, Huddersfield; I. Henderson, South Shields; L. K. Hett, Rugby; A. Hewetson, Leeds; H. R. Holland, Southampton; P. E. Holland, Exley, Kent; J. H. Hood, London; P. Howard, Waterloo, Ashton-under-Lyne; T. C. Hughes, Cloughton, Birkenhead; G. B. Jackson, Newcastle-under-Lyne; R. Jaques, Knaresborough; J. McN. Jeffrey, Pimlico, S.W.; J. R. Johnstone, Ayr, N.B.; G. B. Kaufmann, Sutton; S. V. Kendall, South Croydon; P. K. Kipps, Lewisham, S.E.; S. M. Kirkman, Croydon; F. Lambriek, Burton-on-Trent; T. S. Linton, London; F. A. Llewellyn, Richmond; H. S. Lockhead, Stroud Green, N.; H. J. Luck, Leighton Buzzard; C. B. Lync, Cheltenham; G. N. Lynn, Newark-on-Trent; R. J. Macdonald, Inverness; A. J. McLean, Brighton; C. S. Madeley, Perry Barr, Birmingham; T. C. Mannooch, London; G. P. Marshall, Leek; C. J. F. Martindale, Wetheral, Carlisle; H. E. Matthews, Yeovil; S. W. Milburn, Sunderland; W. Melbourne, Bishop Auckland; C. J. Mole, Plymouth; W. Moor, Morecambe; E. J. E. Moore, Newport; C. O. Moreton, Edgbaston, Birmingham; W. E. Müllerhausen, Forest Gate, E.; W. W. Neat, Brynmawr; D. E. Oram, Croydon; W. A. Orton, Harehills, Leeds, N.; W. Park, London; G. E. Pearce, Johannesburg; A. T. Phillips, Rickmansworth, Herts; H. G. Phillips, Richmond; A. D. Philpott, Dover; B. Pierce, Llanfair, P.G., Anglesey; D. J. G. Plumley, Clifton, Bristol; R. S. Ponting, Kingsdown, Bristol; W. W. Price, Liverpool, S.; C. E. F. Prynce, Bedford; S. G. Rellly, Bayswater, W.; W. G. Relp, Carlisle; L. A. Reynolds, Newington Hall; J. B. Richardson, Sholely Bridge, co. Durham; P. Richardson, Thornton Heath, S.E.; S. R. Riches, Balham, S.W.; F. A. Roberts, Ty Birt, Mold; S. Robertson, Dumbarton; F. J. Robinson, Brixton, S.W.; H. E. Rolley, Fulwell, Nottingham; J. A. Ross, Wainburgh; G. C. Rubie, Dover; H. J. Ruddie, Watford, Herts; A. Rylatt, Hull; W. H. Sagar, Blackpool; G. S. Seales, Westcliff-on-Sea, Essex; G. D. Scammell, Redland, Bristol; S. M. P. Sheppard, Camberley, Surrey; A. S. Slater, Besham, Gateshead; T. Spencer, Putney; G. R. Stanislaus, Bayswater, W.; W. C. Steljes, South Tottenham, N.; G. J. T. Stemp, Newport; J. J. Stout, Stockton-on-Tees; R. V. Sturgeon, Whalley Range, Manchester; F. Suddards, Bradford; M. C. Sunter, Chorlton-cum-Hardy, nr. Manchester; T. S. Tait, Paisley; J. H. Taylore, Whitley Bay, R.S.O., Northumberland; F. D. Thomson, Dundee; A. I. Turner, Forest Gate, E.; A. Walsley, Haslingden, Lancashire; R. A. Walter, Harringay, N.; S. K. Watkins, Rotherham; R. A. Welch, Crofton Park, S.E.; W. B.

Wheatley, Hull; W. G. Whincop, Stoke Newington, N.; A. E. M. Whitehouse, Heaton Moor, Stockport; H. Whittaker, Accrington; H. S. Whittingham, St. John's, S.E.; H. G. Wicks, Bournville, nr. Birmingham; J. P. Williams, Llangollen, North Wales; F. C. Wilson, Edgbaston, Birmingham; N. F. S. Winter, Blackpool; L. S. Wood, London; W. E. Woodin, Ankerley, S.E.; J. Woollatt, Nottingham; C. H. Wright, Aylesbury.

The Intermediate Examination.

G. Nott, Leicester; W. Harvey, Kennington, Ashford, Kent; P. M. Fraser, Streatham-hill, S.W.; H. L. Samson, Balham, S.W.; S. J. Webber, Maidenhead; S. S. Waghorn, St. John's Park, N.; L. S. Wood, London; P. Dalton, Birkdale, near Southport; E. L. Wren, Leicester; H. A. Beeston, Dover; J. S. Cable, Brixton, S.W.; A. G. Lynham, Exeter; C. H. Potter, Matlock Bridge; F. G. Oliver, Tweed-month, Berwick-on-Tweed; A. D. Aitken, Airdrie; R. H. Blackburn, Manningham, Bradford; H. Blackadder, Broughty Ferry, W. Scotland; W. P. Schofield, Leeds; A. E. Beswick, Swindon; G. H. Parry, Upper Warrington, Surrey; W. L. Mellor, Halifax; D. W. Ditchburn, Leytonstone, Essex; R. G. Roberts, Stafford; L. S. Fifoot, Penarth; F. N. Bamford, Bloomsbury, W.C.; T. S. Attle, Putney, S.W.; F. L. Atwell, Plumstead, S.E.; F. H. Bulmer, Balham, S.W.; T. H. O. Collings, Hove; W. F. Dickinson, London; J. P. Firth, Walton, nr. Wakefield; B. W. Fitch-Jones, Bexhill; H. French, Hull; E. H. Gandy, Canonbury, N.; J. H. Gask, Stamford-hill, N.; J. H. Goodchild, Finchley; G. H. B. Gould, Ipswich; J. H. Hargreaves, Fulham, S.W.; A. J. Healey, London; F. B. Hooper, C.-on-M., Manchester; W. Jackson, Hitchin; W. Kerr, Putney, S.W.; H. G. Lay, Wellingborough; A. S. W. Mackay, Barking, Essex; M. R. Martin, Chiswick; A. M. Millwood, Barnes, S.W.; G. E. H. Newbold, Gainsborough; G. W. Page, Bolton; J. A. Pirie, Highbury, N.; H. A. Porter, Gravesend; A. Rigby, Manchester; H. E. Secombe, Clapham Common, S.W.; A. F. Slaughter, Reading; J. C. Smythe, Mutley, Plymouth; B. H. Sutton, Basildon, near Reading; W. I. Travers, Kensington; G. M. Trench, Honor Oak, S.E.; R. J. Tyndall, Meida Vale, W.; F. A. Walker, Hampstead, N.W.; J. B. Wills, Clifton, Bristol; W. B. Wylie, London; S. A. S. Yeo, Exeter.

The Final and Special Examinations.

T. F. Amery, Chelsea, S.W.; D. Anderson, Hampstead, N.W.; E. G. G. Bax, Catford, S.E.; W. S. Beaumont, Manchester; M. S. Briggs, Otley, Yorks; J. S. Brocklesby, St. James's S.W.; J. T. W. Brooke, Bowden, Cheshire; C. F. Callow, St. Leonards-on-Sea; C. P. Carter, Mansfield; G. R. Ellis, Longsight, Manchester; J. A. Fletcher, Leicester; H. C. Fread, East Molesey; W. J. Freeman, Halifax; C. L. Gill, Regent's Park, H.W.; H. H. Golding, Woolwich; P. A. Hinchcliffe, Barnsley; P. A. Horrocks, London; A. B. Hubbaek, Kuala Lumpur, Selangor, Federated Malay States; D. B. Jonkinson, Kimberworth, Rotherham; G. A. Johnson, Croydon; J. Miller, London; C. Nicholas, Tooting, S.W.; H. L. North, Llanfairfechan, N. Wales; C. T. Palmer, Stamford-hill, N.; C. Paterson, Bowdon, Cheshire; A. R. Powys, Denton, Grantham; E. Quiggin, Blundellsands, Liverpool; G. S. Salomons, Manchester; H. R. Smallman, Wimbledon Common, S.W.; N. C. Smith, Moffat, N.B.; E. G. W. Souster, Northampton; C. J. Thompson, Wandsworth, S.W.; J. N. R. Vining, Sydenham, S.E.

The following shows the number of failures in each subject of the Final:—

I. Design	23
II. Mouldings, etc.	34
III. Materials	13
IV. Sanitation	14
V. Specifications	11
VI. Construction: Foundations, Walls, etc.	15
VII. Construction: Iron and Steel, etc.	27

The Ashpitel Prize.

On the recommendation of the Board of Examiners the Council have decided to award this prize to Mr. Charles Lovett Gill, he being the candidate who has most highly distinguished himself in the Final Examinations held during the current year.

The Chairman moved "that the Registration Committee appointed by the general body be allowed to co-opt additional members," and this was agreed to.

Mr. G. A. T. Middleton moved "that it be referred to the Council to consider the

advisability of appointing an official assessor of architectural competitions." The Chairman accepted the motion on behalf of the Council.

Reinforced Concrete.

A discussion then took place on the papers on Reinforced Concrete, read on the 21st ult. by Messrs. W. Dunn and M. L. G. Mouchel.*

Mr. De Vesian read a communication from M. L. G. Mouchel in which he referred at some length to the question of formulae and methods of calculation with regard to ferro concrete. He said that there were concrete specialists who were wasting their time in formulae, for often if they followed them they would arrive at absurd results. In regard to his work every case was considered separately and was gone into as a fresh problem. Although he had not great faith in the hydraulic test, he had made such tests. In 1901 the Mersey Docks and Harbour Board tested a pillar at 245 tons per sq. ft. As a matter of fact, however, he had had a good many pillars in actual use under varying conditions for many years, and these pillars had been subjected to eccentric tests of a severe character and stood the trials, and he claimed that such facts as these were worth tons of theory. Mr. De Vesian afterwards exhibited a large number of lantern slides showing how ferro concrete had been used, and was being used, in the construction of warehouses, mills, factories, bridges, piers, etc.

Mr. Watson expressed the great regret that Mr. Dunn felt at being again unable through illness to be present, and said that Mr. Dunn had asked him to read some replies to questions which had been sent to him by letter. The first question was as to the effect of temperature on the rate of setting of cement, and this had been fully investigated by Professor Tetmajer in the laboratory of the University of Zurich. These reports were not easily got in this country, but extracts showing the effect of temperature on the rate of setting of cement would be found in Johnson's "Materials of Construction," which should be found in the library of the Institute. Investigations were made as to the ways in which the time of setting for tensile strength are influenced, and they might be expressed by means of graphical representations. For these researches cement was used, the normal time of setting of which was one and a half hours, and the normal tensile strength of which was 23 kilos in 28 tons. In the experiments, both the cement and water were brought to a temperature, and it was shown that a cement which had the normal temperature of 16° centigrade and had a setting time of one and a half hours at 7° centigrade, which was winter temperature, it did not set in five hours; while in 30° centigrade it set in twenty-six minutes. If temperature were left out of consideration, a medium-setting cement might be found either slow or quick-setting, and many complaints which had been made were thereby explained. The results of the experiments were these:—At 7° centigrade the time of setting was five hours; at 10° centigrade, three hours; at 16° centigrade, one hour thirty minutes; at 23° centigrade, fifty minutes; at 30° centigrade, twenty-six minutes. When cement and mortar set at a temperature below freezing-point, the water it contained was likely to freeze and the mortar could not properly harden and became disintegrated, and so it was customary in frosty weather to use some salt in the water for mixing mortar to prevent the freezing. Another question was asked as to the amounts of materials for concrete. When the aggregate was mixed and rammed, the finished concrete occupied much less space than the various constituents did separately. The results of actual measurement showed that 580 lb. of cement was required for each cubic yard of rammed concrete. The other question asked was as to a diagram figure for Marsh's formula. This was not mentioned in the paper, but was given on page 288 of Marsh's "Reinforced Concrete."

The Chairman, in calling on Mr. Marsh to speak, explained that that gentleman was the author of two volumes concerning reinforced concrete, which were in the library. Mr. Marsh said there were only two things he would like to refer to in Mr. Dunn's paper. In the first place, Mr. Dunn stated that cement with no free lime could be manufactured, but he thought that this was seldom the case. Even with the rotary kilns, when the clinker came out they saw small uncalcined bits. It was practically impossible to pick these out, and they went through the grinding mills with the rest

of the clinker. He believed there were some firms who introduced a jet of steam in the tube mills, which had practically the same effect as air slacking, but he did not think this was a general practice. Another remark of Mr. Dunn was that no formula had been devised for columns which took into account initial stress. He felt that any such formula would be very unreliable. The stress induced in concrete varied so very much according to the dampness of the atmosphere. When concrete with reinforcement in it set in dry air, there were tensile stresses induced, but if it set under water the stresses are compressive. Consequently, if they had a formula which took into consideration initial tensions, and the air happened to be damp when the column was setting, they might have initial compression, whereas what they had taken into consideration was tension. Hence, any formula which did not take into consideration the exact conditions existing when the column was being made would be unreliable. M. Mouchel's paper was an excellent statement from the practical view of reinforced concrete, but it would have been better had he treated the subject more generally. M. Mouchel simply dealt with the Hennebique system. It was an excellent system, but it was only one of many systems, each of which had good points, many being just as good as M. Hennebique's. Of course, one could not be surprised that M. Mouchel should only speak of his own system, and they could not blame him for it. The Hennebique system was, he believed, the first to be commercially introduced into this country, but he was not sure that the Expanded Metal Company was not really the first. Besides the Hennebique system, there were others represented in England, amongst which were the Ways and Freitag, an offshoot of the firm which exploited the old Morrie patents and was a very old firm. This firm was represented by Mr. Werner of the Armoured Concrete Construction Company. M. Cottancin had also constructed several buildings and water tanks in this country, and several other systems had representatives in London. As reinforced concrete became more generally understood and known in this country, he hoped that there would be other systems brought forward. American systems in particular would be introduced, and he believed it would be a good thing for all of them when they were. The stirrups which M. Mouchel mentioned were specially useful for tying together the layers of the concrete. The layers had to be put in in small thicknesses and very often after considerable lapse of time, and, consequently, it was very beneficial to have these stirrups to tie them together. Many other constructors use this form of reinforcement. Some of them attach them to the longitudinal bars, which is an excellent thing, as it tended to resist the shearing along the main reinforcements. The bent-up rods which M. Mouchel mentioned as being used to resist the tension over the supports were also extremely useful in resisting the shearing. With respect to columns, Mr. Dunn had very clearly shown the nature of failure. The horizontal bindings usually employed in columns are not sufficiently close together to resist the swelling and shearing of the concrete. There was no doubt that the hooped column introduced by M. Considère was the most efficient form of construction. He was surprised that M. Mouchel should have spoken of M. Considère as being unpractical, for he considered him one of the greatest authorities on reinforced concrete. It might interest them to know that M. Considère's patents had been taken up by the Armoured Concrete Construction Company. M. Mouchel had said that no system could compare with M. Hennebique's in simplicity, but Ransome's system in America was almost identical with Hennebique's, and many others were quite as simple. American architects and engineers were now taking up the design and construction of their own buildings in reinforced concrete, and they always applied the reinforcement in a simple and scientific manner. M. Hennebique was certainly one of the first to introduce the reinforced concrete beam, but Ransome in America, Cottancin and Coignet in France, and Möller in Germany, introduced it about the same time, and there seemed to be some doubt as to who was the first. Every honour was due to the pioneers of this material, and there was no doubt that M. Hennebique ranked very high amongst them. With reference to the formula used in ordinary reinforced concrete structures there was not the slightest doubt that it was right to take into consideration the elasticity of the

two materials, and he would just explain the nature of the effects on concrete under pressure, which would show the reason why elasticity should be taken into account. When concrete was first put under pressure it contracted very considerably, and on the load being removed there was a very considerable permanent set. If the same load was applied again there was still a distinct shortening, and still a permanent set. If they applied and removed the load several times they would go on having a shortening and a permanent set, but these became less and less as they kept on applying and removing the loads until at last there was no permanent set at all, and the shortening was very considerably less than the shortening under the first loading. They would see what effect that had when reinforcement was introduced. Under the first load or test the concrete contracted considerably. Consequently the reinforcement which took up the same contraction as the concrete could take a very considerable amount of stress. After the concrete had taken its permanent set it contracted considerably less, and consequently after the structure had been loaded several times the stress taken by the reinforcement was very much less than under the first load. That of course applied not only to columns but also to beams. Many constructors now used a formula based on elastic resistance. The American systems generally used formulae which took into account the elasticity of the two materials. The comparatively great elongation of reinforced concrete as compared with plain concrete was due to the presence of the reinforcing metal. The reinforcing metal takes up the stress and distributes them over the whole length of concrete, and if there are any weak sections the reinforcing metal carries it over the weak section and takes it to the stronger section. Also when a crack did occur the reinforcement acted exactly in the same way. M. Mouchel implied in his paper that laboratorial experiments on reinforced concrete were unreliable and were not conducted on pieces of practical dimensions, but most of the experiments on this material during the past few years had been conducted on pieces of practical dimensions, and the mixtures of concrete and other necessary details had been carefully noted. It was to be hoped that such experiments when properly interpreted would lead to the establishment of true formulae. Of course even the best formulae at the present time were not absolutely correct, but when they thoroughly understood the nature of the properties of this material which they were rapidly learning by these excellent experiments, there was no doubt that absolutely true formulae would be found which would be generally employed. With reference to the acceptance tests of floors he thought that the load ought to be applied across the whole width of the floor. If it was only applied over one beam or bay they did not get a true result, because the whole of the floor acted together, and the beams at the side helped to carry the load. Thus if they applied the test load over only one beam or two beams it was not sufficient, and the load should be applied across the whole width of the floor. One of the most valuable properties of reinforced concrete was its monolithic nature. Each part acted with the other, in resisting the stress, and the way in which a reinforced structure resisted being knocked about and generally damaged had been very well shown by M. Mouchel in the photographs he had shown of the tramway car shed and the coal silos where there had been accidents. There was also a very good demonstration of this in the destruction of the San Moreno Pavilion constructed by M. Cottancin for the Paris Exhibition in 1900. That pavilion measured 35 ft. by 30 ft., and was about 39 ft. high; the top 24 ft. of the height was only supported at each corner. After being subjected to very severe fire tests the three supports at one corner were broken away one after the other, and the building only collapsed after the three supports were knocked completely away. The reinforced concrete pile was of the greatest use, and its introduction was entirely due to M. Hennebique. Its excellent qualities were too obvious to need any further comment; nor did M. Mouchel's excellent demonstration of the several advantageous qualities of reinforced concrete require enlargement excepting that he might point out that other systems possessed the same

* See our issue for November 26.

qualities. He cordially agreed with M. Mouchel in the main in what he said as to the by-laws governing reinforced concrete construction, but he disagreed with him on the subject of formulae. It was very necessary indeed that formulae should be inserted. Some of the restrictions as to design which had been instituted by various authorities up to the present were too severe, and that of the Prussian authorities for columns was ridiculous, but this latter was due to the very low working stress allowed on the concrete which was only one-tenth the ultimate resistance. It must be remembered that the constructors did not take the eventual responsibility for the structures, and as the responsibility fell on the authorities it was perfectly right that they should institute methods of calculation to guard themselves in every way. He hoped if any by-laws were framed they would institute no such absurd requirements as line D in figure 9 B, but at the same time some formulae should be insisted upon which would meet the general requirements, although they might not come up to the ideals of some constructors.

Mr. H. Anderson, as a manufacturer of Portland cement, said he was glad to be able to listen to such papers. This material was one into which cement largely entered, and naturally he had followed its development with interest. Mr. Dunn had alluded to the fact that if the cement was bad when the concrete was made cracks formed. It would not be safe to assume that this was due to the quality of the cement. It was equally necessary that the materials forming the aggregate should be of the first quality, and that great care should be shown in mixing the cement with the aggregate. He must say that a combination of the high tensile strain of steel with the great crushing resistance of concrete formed an ideal amalgamation, and it was a matter for regret that in this country ferro-concrete had made such slow progress compared with the rapid strides made both on the Continent and in the United States of America. This leisurely movement in England he put down to two causes, and the first of these was the antedelinian restrictions of the building by-laws. Secondly, it was due to the little attention given to this science, as he called it, by the technical Press of the country. He hoped that the papers which had been given before what he understood was a record attendance in that building would do something towards giving a stimulus to the interest shown in the material, and would encourage the technical Press to give more attention to the subject, and thus remove the necessity of those who wished to know something of the latest developments having to go to American and Continental journals.

Mr. H. K. G. Bamber, Managing Director of the Associated Portland Cement Manufacturers, Limited, said he would like to refer to the question of specifications and tests which Mr. Dunn proposed. Mr. Dunn said it would be very beneficial to the profession and the trade generally if some sort of standard specification could be adopted. He quite sympathized with Mr. Dunn when he said that engineers and architects were in great difficulties as regards their specifications, he had no doubt that it was so. There was no doubt that every engineer or architect there liked to frame his specifications in accordance with his own views, and it would be a great advantage if they would compare these and see the immense variation there was between one and the other. As they knew, a Standardising Committee had been sitting, and had now completed its deliberations. That Committee was composed of representatives of the engineering and architectural professions, contractors, and Portland cement manufacturers. They had heard a good deal of the English manufacturer not being up-to-date, but in this particular case in framing a specification, which was perhaps the most stringent yet put into force, the representatives of the cement trade were the prime movers in working up that specification to the highest possible standard. He believed that specification would shortly be made public, and he hoped those members of the profession who were about to alter their specifications would await its arrival before embarking on new conditions. They could imagine that an architect who framed his own specification found it difficult, and they could imagine also the difficulty of the cement manufacturer who had all these various specifications put before him. He would welcome the time when the architectural profession and the engineering profession

generally adopted some standard specification, and relieved the cement manufacturer from the difficulty of trying to comply section by section with the specifications he had given him day by day. Mr. Dunn had referred to the fineness of grinding, and he would point out that of late years cement was ground much finer than in the past. The profession probably did not realise what an immense difference that made to the properties of cement. It made the cement much quicker setting for the reason that a large proportion of the material which formerly constituted cement had absolutely no cementitious value, whereas now, by much finer grinding, it was brought into use, and the avidity with which the cement took up water and the chemical action resulting was much greater than in the past. It was much more quick-setting, and methods had been adopted to regulate the setting time. The custom in Germany, and also in England had been to add a small percentage of gypsum, which had the effect of retarding the setting time. Many engineers, however, had a great objection to the addition of such material, and in order to get over that difficulty, and regulate the setting time in accordance with the requirements of various specifications, a method which Mr. Marsh referred to had been invented by himself and largely employed. By this means they were able to make cement of the highest quality and regulate the setting time without the aid of gypsum at all. The effect of the hydrating process was partly a chemical one, and much improved the soundness of the cement. Mr. Marsh referred to the question of free lime and rotary kilns. He had perhaps the largest installation of rotary kilns in the United Kingdom under his control, and although Mr. Marsh said there did appear at times to be very small particles of free lime passing through; the percentage of half burned obtained by that process as compared with cement manufactured by the older processes was infinitesimal, in fact, the percentage could hardly be measured.

Mr. Hammen, jun., of W. Cubitt & Co., who are licensees under the Hennebique patents, said a few words on ferro-concrete from the contractor's point of view. He might say at once that, so far as the scientific part of the business went, he knew nothing about it. Mr. Dunn some years ago asked him to look into the question as to whether they were getting the best cement that could be made. He went into the question carefully with Mr. Dunn, and the result was that they had now a specification which he thought was more stringent than any in England. The cement manufacturers, however, had so come up to the standard that they gave him a better cement than he asked for. There were two points of interest he had noticed. One of these was that in the old days it was always thought when putting in concrete floors an allowance should be made at the edge of the floor for expansion. On account of the improvement in modern cement that necessity was entirely done away with, and now, when they constructed a ferro-concrete floor, they rammed it tight home to the walls on both sides, and in all the floors they had ever constructed of ferro-concrete there had never been the least sign of expansion; as a matter of fact, the concrete shrank and did not expand when setting in air. His second point was that, owing to the extremely fine grinding, the cement deteriorated when kept any length of time. They had noticed in particular where they had had to deal with piles and work of that description, where the punishment was enormous, that piles made of cement two months old were not so good as piles made of cement ten days old. He gave that experience for what it was worth. In numerous buildings they had carried out, they had made tests of the floors and the columns, and at one of these tests at Tottenham, for which Mr. Arthur Dixon was the architect, their chairman that night was present. The result from those tests of fire-proof floors were extraordinary. The deflection was so slight with the enormous loads they were made to carry. Quite recently they put 40 tons on to a 9'9" ferro-concrete column in a building designed by Mr. Pearson, and got a deflection in the beams bearing on the column of 3 millimetres. As he had said, he knew nothing about the scientific part of the matter, but what did occur to him was, how were architects going to design in this material, when the time occupied and the expense came to be considered. The work of designing, drawing, and taking out quantities was enormous; it would mean engaging the services of several

trained engineers to work out the complicated figures; all this meant time and money. Consequently, it looked to him as if they would always have to leave the matter in the hands of the specialists. There had been a discussion that night on the question of formulae. He believed that Mr. Hennebique had never published any formulae at all, although other persons had published them for him. It was obvious that one formulae for floors and beams would not get over all the difficulties that arose in general construction. When they came to deal with a building it was not all floors and beams. There might be exceptional difficulties crop up which would require special reinforcement at certain points, and then they would find the ordinary formulae did not touch it and they would have to go in for experienced specialists. "Experience doct" should be the motto of all. As he was coming into the room a gentleman raised a question as to whether it was as easy to alter these buildings of ferro-concrete after they were built. It surely was easier to cut steel rods than it was to cut steel girders. The special difficulty of altering ferro-concrete was the hardness of the concrete, but that was only because the concrete in this form of construction was particularly good.

Mr. A. T. Walmisley said the importance of the proper construction of ferro-concrete was great, and he felt they could not be too thankful for the opportunity given them to discuss the two practical papers which had been read. M. Mouchel had brought a complete description of Hennebique's system, and they knew that wherever it had been used it had been most successful. But, of course, there were other systems that architects had to deal with, and amongst these Mr. Marsh had mentioned the Expanded Metal system, which was used in works of construction. The Expanded Metal system could be placed in sheets up to 16 ft. in width, and it had simply to be laid down at a proper level and position and needed no further supervision; whereas, if he had to make a concrete floor with Hennebique's system he would want to see that the rods and saddle pieces and so on were all properly placed, and so there would be a great deal more supervision needed. Although he agreed with the speakers that they could not rely too much upon formulae, yet they could gain some benefit by the consideration of formulae applied by the result of experience. It would be a very injudicious thing to place the reinforcement upon the neutral axis of the slab; they wanted to place it where it would take the tension properly. Although they could not rely upon formulae in their entirety, yet it was well to formulate their experience. If they took a retaining wall or a concrete footpath made of pure concrete they found it would show cracks. He had watched various retaining walls, and had found, as a rule, these cracks would average about 11 ft. apart; so that, if they made a straight joint in a retaining wall of 11 ft. and introduced reinforcement into the concrete, they would have no cracks at all. Then, with regard to piles, for which Hennebique's system was largely employed, it had been found at Southampton that, if they took a rod covered in good concrete and embedded that concrete to the length of eleven diameters of the rod, they could break the rod, when the concrete had set, before they pulled it out of the concrete. There was one thing which must be remembered above everything, which was that in reinforced concrete it was absolutely essential to have the best material, both of the aggregate and the cement. He had no fear of corrosion if he eliminated sea-sand and sea-water. They had heard that the action of the iron and concrete were about the same, and that there was no occasion to provide for one expanding and the other contracting. He felt that the subject had elucidated very profitable discussion, and no doubt these papers were simply the prelude to other papers which must come before the Institute later on, when they had further experience upon the subject.

Mr. E. Robins remarked that he had had a long experience of concrete work, and in 1869 he took out the first patent for armoured concrete, which the Americans called skeleton construction. In 1877 he took out a patent for employing it by casting the whole of a house from the middle floor window, and giving the decoration and reverse forms of that decoration which would form different features in each room. That was before anything of the kind was done from concrete in America, and therefore it was an English invention, and he claimed

to be the pioneer of the system. His experience was that Portland cement was not reliable so far as adhesion was concerned, and he had adopted the plan of preparing materials to make it more adhesive. Where he used no heat, he added to the Portland cement about 10 per cent. of whitening and gum dextering. Where heat was employed, he used silicate of soda, and that became petrified by the heat, and it was a hard matter to chip it off. By these means he could use it in the best form for any kind of construction.

Mr. Hilson Nash did not think that M. Mouchel had made the best of his case, for he had not told them the great cost which would be saved by putting up buildings of this construction. Some four years ago a large warehouse was put up partly under his supervision, and in the building, costing 10,000*l.*, he was able to inform his client that by using ferro-concrete he could save 1,000*l.*, and that he felt was a very important item. Another thing they saved in warehouses by the use of the material were ceilings and floors. They had a homogeneous floor of concrete, and when it was finished they had simply to whitewash the under side of the floor. There were drawbacks to the system where they had machinery, because it necessitated providing for the situation of the machinery before the floors were made, so that the holes could be left for the machines. He had very great faith in Mr. Hennebique's system, although he thought that some other systems were equally good. He believed that any one using the system would find it most useful and economical.

Mr. E. W. Hudson asked if there was any possibility of adjourning the discussion. As a member of the R.I.B.A. he was wondering where architects came in at all in the discussion.

Mr. T. L. Banks said he held that all novelty in architecture arose from two causes—either new requirements or the use of materials which the ancients did not use. Lately they had had two new materials—first iron and now concrete. He could not say that the introduction of iron had improved architecture at all, and he rather thought it was the reverse. In the last few years he had given considerable attention to fire-proofing, and his idea with regard to protecting iron was to separate the protecting shield from the metal. Any covering, such as concrete or terra-cotta, in contact with the metal is necessarily thrown off where the metal expands under heat. What he rose for, however, was to call attention to a material which perhaps cement manufacturers might not like. He read in the paper that the best cement was the slowest setting cement, but, unfortunately, they lived in a "hustling" age, and could not do with slow-setting cement. The strongest cement he knew of, and which he had used for thirty years, was slag from the hematite blast furnaces, not the slag from the lower ores. He had brought with him a portion of a brick made thirty years ago, and he did not think any cement manufacturer could produce anything so hard as that. He built a house which cost 30,000*l.* with nothing but that slag, and it was used very much in the North of England. It would stand fire better than any material he knew, but its drawback was that it set so slowly that he was afraid many men would not have the patience to wait for the setting. It hardly set in a fortnight. He would like to know what effect fire had on the rods in the beams, for they knew the effect it had on girders; secondly, was there any danger of the cracking in large areas of cement roofs and floors simply by the contraction of the cement? and, thirdly, when did cement cease to contract? He had observed that cement for twenty years and found it still contracting, and he did not know when it did stop. Fourthly, he would like to know what effect weather had on ferro-concrete-constructed buildings.

Mr. S. Perkins Pick said that he would not have risen had not the question of slag been introduced, but his firm had had very lamentable experiences of the use of slag as an aggregate for concrete. We had some time ago to construct a covered reservoir of over 200 ft. in diameter, and when the cement concrete was made the aggregate was formed of slag from Northamptonshire iron furnaces. It appeared to be quite as hard as an aggregate could reasonably be expected to be, and apparently made excellent concrete, but after the reservoir was filled with water attention was called to certain serious leakages, and upon inspecting the reservoir they found there was a very horrible smell from the outlet which received the under

drainage from the reservoir, and which the chemist informed them was sulphuretted hydrogen. The cracks seriously developed, and they tried at first to combat the leakage by putting an enormous iron band round the structure. The effect of that was that the whole of the vaulting sprang upwards, and cracked along the lines of least resistance. They had to take the top off, and then they found that the concrete, which when made appeared to be so good, could be taken in the hand and squeezed through the fingers. The chemist informed them that this was due to chemical action. It was altogether a bad experience for them. With regard to ferro-concrete generally he had had very small experience of it, and had only used it for floors and roofs, and his experience of its use had been quite different from what had been stated. He found without exception that they expanded. He had had cases under his own supervision where walls had been forced out one, two, and three inches, where they had had iron as a tie in the concrete. As an architect, he rather feared a system like that coming into general use, for it appeared to him that the hanging out of great oriel windows, angle turrets, balconies, and so on, without, architecturally speaking, any reasonable support, was destruction to good architecture. Engineers might perhaps be interested in such freaks, but he felt that, as architects, they were going on wrong lines. Of course he spoke absolutely as an architect from the artistic point of view when he said he feared the ferro-concrete coming into general use.

Mr. L. Solomon said they had been shown buildings where the upper walls were $4\frac{1}{2}$ in. or 5 in. thick. He would like to know how they kept the cold out in cold weather and the heat out in hot weather.

The Chairman said he did not know that they could continue the discussion with any further benefit, but they were much obliged to the gentlemen who had come there that night and joined in such an interesting discussion. Unfortunately, he did not hear the papers read, and he was afraid if he had he would have been quite as foggy as Mr. Hannen said he was with regard to the technical part of it.

The discussion then closed.

The Chairman announced that the next meeting would be held on December 19, when papers on "Architecture and Building Acts" would be read by Messrs. Lacy W. Ridge and J. S. Gibson.

THE INSTITUTE OF SANITARY ENGINEERS.

THE annual dinner of the Institute of Sanitary Engineers, Limited, was held on Wednesday at the Holborn Restaurant, W.C. Mr. W. J. Dibdin, F.I.C., presiding, in the unavoidable absence of the President, Mr. W. H. Maxwell, A.M., Inst. C.E. There were also present—Mr. C. Tuff, M.P., Mr. W. Whitaker, B.A., Chairman of the Royal Sanitary Institute, Surgeon-Colonel W. R. Smith, M.D., and Messrs. J. A. Crowther, President-elect, W. Fairley, C.E., J. T. Griffin, Chairman of Council, A. J. Martin, J. C. T. Murray, Dr. Thresh, —Thompson, A. E. Ashby, Secretary, and others.

The loyal toast having been honoured,

Mr. W. Fairley proposed the "Imperial Forces," coupled with the name of Surgeon-Colonel W. R. Smith, M.D., V.D., who suitably responded.

The Chairman then proposed the toast of "the Houses of Parliament," coupled with the name of Mr. C. Tuff, M.P.

Mr. Tuff, in reply, said there was room for very great improvement in the ventilation of the House of Commons. If some engineer would contrive some apparatus that would remove the impure air that the members had to breathe over and over again, and could bring in a pure and fresh supply that would not have that sporadic effect on some members that the present air had, it would be a very great advantage.

Mr. A. J. Martin then proposed the toast of the evening, the "Institute of Sanitary Engineers." Every one who knew the Institute and the sterling work which it was doing would agree with him that it is an Institute which abundantly deserved to prosper, and he was glad to see signs that it was on the way to prosperity. He saw an earnest of this in the hard-working and capable committee and

secretary. An intelligent interest in sanitary matters was by no means widely diffused amongst the public at large. Let them contrast for a moment the absolute apathy with which sanitary questions were regarded, and the interest with which our countrymen were watching the course of the war in the Far East; and yet he doubted whether that campaign was of such importance to the people of this country as the questions with which the Institute had to deal. The sanitary engineer was, in company with others, a soldier who waged a stern and unceasing warfare with disease and dirt. His mission was not to take life but to preserve it, and how well he did his duty would be gathered by a comparison of the death-rate of to-day with the death-rate which prevailed fifty years ago. There was an enemy greater than disease and death which the sanitary engineer had to encounter, and that was ignorance, and in fighting that there was but one weapon to rely on, and that was education. The work of the sanitary engineer and those associated with him was in great measure a work of education. The sanitary engineer had to teach the public and those members of public bodies with whom he came in contact. They had to be taught many things, especially that, of all the duties entrusted to them, there was none so sacred as the care of the public health. They had to be taught also that systems and methods which were the best of their kind thirty years ago were not necessarily the best of their kind now. Most important of all, they had to be taught that in sanitary matters the best was usually the cheapest in the end. But true education began at home, and before the sanitary engineer could educate others he had to educate himself, and that brought him to what he conceived to be the chief function of this Institute. It was pre-eminently an educational body, and he must not forget those kindred institutions which were engaged in similar work. Mr. Martin then referred to the lectures and classes of the Institute, to the meetings for the interchange of opinion, and to the excursions which it makes to interesting and important works, and to the distinguished men who had served the Institute in the past. With the toast he coupled the names of the Chairman and Mr. J. T. Griffin, Chairman of Council.

The Chairman, in responding, referred to the excellent work of their secretary, Mr. Ashby, on behalf of the Institute. During the year 53 new members had been elected to the Institute, namely, 8 Fellows, 43 Associates, and 2 Students. The examinations had been extended by the holding of provincial ones; these also had proved a great success. In connection with the examinations, and in conjunction with them, a Students' Grade Examination is now being held for those who are between the ages of 18 and 21. This examination is held for students to graduate for the higher examination when they attain the age of entry, namely, 21 years. The students' lectures were again being given during the winter months in practical sanitary science, in preparation for the spring examinations of this and other kindred institutes. The lectures were given by eminent gentlemen in the profession, and the students who attend them showed by the interest they took, and the homework they did, that the lectures prove a beneficial success to them. The technical colleges were now teaching their classes in practical sanitary science on lines similar to the examination syllabus of the Institute, which tended to show that the Institute is doing good work, besides being recognised as one of the leading institutes in sanitary science. At Altrincham the technical college sent nine of their students to the examination of the Institute, held in September at Manchester. District centres have been formed in Exeter and Cardiff this year, and, with the one in Manchester, were doing good work. For the members in the aforesaid districts papers had been read and discussed, and visits to local works of interest had been taken. The local secretaries were to be congratulated on their success. Other district centres would be formed as was found requisite. The Saturday visits that had again been held from the Institute had proved that such visits were required, and that members took an interest in them, for at all the visits that had been held the members had attended in great numbers, and showed that the knowledge to be gained by these visits was worth all the time, and perhaps a little trouble, that had to be given. Very interesting papers had been read to the members on the sessional meeting

evenings, and these had proved successful and interesting by the discussions that followed.

Mr. Griffin, who responded, said that at the last annual dinner a monthly journal, to be issued by the Institute, was talked about, and that matter, he might say, had not by any means been forgotten.

The Chairman then proposed the toast of "The Visitors," coupled with the names of Mr. G. A. Crowther and Mr. W. Whitaker, B.A.

Mr. Crowther, in the course of his reply, referred to the value to those engaged in sanitary works of visits to works and places of interest. He wished he could get members of his Council to visit places where work was going on, for that would help him in his work very materially.

Mr. Whitaker spoke to the same effect as to visits to works, and said that there was only a friendly rivalry between the Institute and the Royal Sanitary Institute. If the Institute of Sanitary Engineers increased and prospered, as he hoped it would, they would do no one any harm.

Dr. Thresh then gave the toast of "The Press," and in doing so said he was not at all certain that the Institute would be well advised in producing a journal as was proposed.

With the toast the names of Mr. C. Ady and Mr. Thompson were coupled, and these gentlemen having responded, the proceedings terminated.

The half-yearly meeting of the Institute was held in the afternoon, in the offices, Bloomsbury-square, W.C., Mr. J. T. Griffin, Chairman of Council, in the chair. The half-yearly report was presented, which showed a membership of 540—a large increase over the preceding year. The report also showed the great help which had been given to those who were desirous of becoming sanitary engineers by the help of the examinations which had been held in the provinces. Mr. J. A. Crowther, engineer, Southampton, was elected President for the ensuing year, and other officers were elected.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Bermondsey Borough Council 16,457*l.* for paving works; and Lewisham Borough Council 8,828*l.* for a similar purpose. Sanction was also given to the following: Hackney Borough Council, sanction to borrow 8,900*l.* for sewer works; Lambeth Borough Council sanction to borrow 3,411*l.* for paving works; Shorelditch Borough Council sanction to borrow 1,255*l.* for street lighting purposes, and Westminster City Council 1,966*l.* for contribution to cost of street improvement.

Lines of Frontage and Projections.—The Building Act Committee recommended that the Council, in the exercise of its powers under section 22 of the London Building Act, 1894, but in no way otherwise than under such section, do consent to the erection of a one-story lavatory addition in front of No. 62, Portland-place, St. Marylebone, to abut upon Weymouth-street, to the line shown on the plan, dated October 1, 1904, submitted with the application of Mr. H. Laks, on behalf of Mr. W. Tebb.

Mr. Lewis moved, and Mr. Spokes seconded, that all words after "that" in the first line should be omitted, and that the following words be added: "Considering it undesirable that an addition should be made to an existing projection beyond the building line, the Council, under the exercise of its powers, do not consent to the erection of any addition."

Messrs. E. White, J. Burns, Howell Williams, and Strans spoke in support of the amendment, which was subsequently carried.

Proposed New Westminster Fire Station.—The Fire Brigade Committee recommended, and it was agreed, that the estimate of 14,360*l.*, submitted by the Finance Committee, in respect of the erection of the new Westminster fire-station be approved, and that expenditure not exceeding that amount be authorised; that of this amount the sum of 13,250*l.* be authorised for the work of erecting the station; that the work be executed by the Council without the intervention of a contractor; and that the drawings, specification, quantities, and the architect's revised estimate be referred to the Works Committee for that purpose.

Standardisation of Rolling Stock, etc.—The

Highways Committee recommended, and it was agreed, that the special maintenance estimate of 350*l.*, submitted by the Finance Committee, be approved; that expenditure not exceeding that amount be sanctioned in connection with the standardisation of the rolling stock used for the London County Council Tramways.

Map of London.—On the recommendation of the General Purposes Committee, it was resolved to allocate a sum of 200*l.* for the purpose of preparing a pocket map of London, showing the property under the control of the Council, such as the schools, working-class dwellings, and other buildings.

Vauxhall Bridge.—Mr. Straus, the Chairman of the Bridges Committee, in reply to a question, admitted that the progress of the work on the new Vauxhall Bridge was very slow, but the quality of the work was of the most satisfactory character.

Motor Fire Engines.—The Fire Brigade Committee recommended that tenders be invited for the supply of a motor steam fire engine.

Sir McVill Beachcroft asked the Chairman of the Committee if he considered that motor-traction was satisfactorily adaptable to fire engines.

Mr. E. Smith said that the motor-engine in the possession of the brigade had been fairly satisfactory, but there were things about them which rendered them less reliable than engines drawn by horses. The committee were watching every invention in that form of traction and its adaptability to fire brigade purposes, and they hoped to make a fuller report in due course. At present, however, they could not entirely rely on motor fire engines.

The recommendation was adopted.

Proposed Legislation.—The Council approved of the form of the London County Council (General Powers) Bill, the Tramways Bill, and the London Port and Docks Commission Bill, which are to be promoted in the ensuing session. In reference to the General Powers Bill the following recommendations were agreed to:—

(a) That the resolution of 21st June, 1904, directing that application be made in the next session of Parliament for powers enabling sanitary authorities to require owners to make reasonable provision for the supply of water to the tenants of each floor in tenement houses, be rescinded.

(b) That the resolution of 21st June, 1904, directing that application be made in the next session of Parliament for powers enabling sanitary authorities to undertake, if they think fit, the collection and removal of offensive trade refuse; and empowering them to require payment of a reasonable sum by the owner or occupier of any premises from which such refuse is removed, be rescinded.

(c) That the London County Council (General Powers) Bill be approved; that the seal of the Council be affixed to a petition for leave to bring in the Bill; and that the Bill and petition be deposited pursuant to the standing orders of Parliament, and with such necessary alterations (if any) in the Bill as the Parliamentary Committee may consider desirable.

Proposed County Hall.—Mr. John Piggott, in accordance with notice, moved that, having regard to the fact that the Council's present rental in respect of the inadequate and disconnected chief offices, comprising over twenty-five separate blocks of buildings, amounts to over 34,000*l.*, and also having regard to the increasing extra expense, loss of time, and inconvenience caused by the departments of the Council's service being so far removed from each other, and to the pressing need for adequate office accommodation for the staff, it be referred to the Establishment Committee to consider and report, as quickly as possible, upon sites available for a county hall and offices, and that the Committee do submit a definite recommendation for the acquisition of the site which, in their opinion, is most suitable for the Council's purposes.

Mr. Edward White seconded the motion, which was carried without any discussion, and the Council adjourned.

PANAMA ARMS AND FLAG.—It is reported in the *Bulletin Commercial*, of Brussels, that the Government of Panama have opened an international competition for designs suitable for the arms, also for the flag, of the Republic. Details of colour and designs are left to the discretion of the competitors. A prize of 200 gold piastres (about 40*l.*) will be awarded for each of the designs adopted. Competing designs will be received at the office of the Secretary for Public Works, Panama, until the first meeting of the National Assembly in 1905.

Illustrations.

THE BOURSE, PARIS: AS RECENT ADDED TO.



THE Paris Bourse, commenced in 1808 from the design of Brogniart and completed in 1827 by Labarre, had been long insufficient for its modern uses. Its enlargement, decided on in 1900, commenced, under the superintendence of M. Cavel, in February 1901 and completed in December 1903, when the new buildings were formally opened. Two months therefore sufficed to carry out the important work, without any interruption of the daily business of the Bourse.

The original building had no basement cellarage, but was merely erected on the surface of the ground. A large subterranean story, now been carried out, including galleys for the passage of vehicles, and for the service of lighting, heating, ventilation, electric lifts, etc., a kitchen to furnish the lunch room, a printing-press, and various other accessory departments.

In regard to the architectural aspect M. Cavel rightly judged that in adding to a piece of purely symmetrical columnar architecture, the only course was to continue the order of columns and the whole architectural ordonnance round the new wings, so as to link up as little as possible the homogeneous character of the design; and in this he has been very successful.

In a building of this classic style, with a central area, the lighting of the new basement was of course a considerable difficulty, which has been solved by the employment of filigree partitions formed of the Luxfer Plate Company's prismatic glazing, which allows floors that transmit light without being practically transparent. The two interior views show the ground floor of one of the new wings entirely floored with Luxfer prismatic glass, lighting the basement below. The interior shows a portion of the basement with the corridors, all lighted by this means.

The estimated cost of the new building was 4 million francs, but it actually amounted to 6 millions. However, it is a thoroughly good piece of work, architecturally and structurally.

SHIPTON COURT, OXON.

The drawings represent some of the interior in an early XVIIIth century house, originally known as "Shipton-under-Wychwood," as modelled from the designs and under the superintendence of Messrs. Perkin & Bulmer-Leads.

The drawing was exhibited at the last Royal Academy.

CHURCH OF ST. CHRISTOPHER, HASLEMERE.

THE new church of St. Christopher, at Haslemere, is a chapel of ease to the parish church. It is designed to seat 200 worshippers, exclusive of the choir and clergy, and with a view to possible enlargement in the future by the addition of an aisle on the north side. There is a room over the vestries for various parocesan uses.

The church is built of Bargate stone (the local rag stone), with dressings of Weldon stone, and is seated with chairs. The font is made of Ancaster weather bed, and the pulpit of oak on a stone base.

The lectern, of wrought-iron and leather, by Mr. W. Bainbridge-Reynolds, and so is the whole of the wrought-iron work in strap hinges and handles and the tower cross; the latter gilded.

The figure of St. Christopher in the niche the west door is in cast lead, and is the work of Mrs. M. D. Spooner.

The church was built by the Haslemere Builders, Limited. Messrs. Spooner & Coburn are the architects.

MEMORIAL CHURCH, MALVERN L.L.

THE church here illustrated, which was erected as a memorial to Archdeacon Livington, and is dedicated in honour of the Saviour's Ascension, consists of a nave and choir. There are no aisles, and the vestries are below the choir, advantage being taken of the natural fall of the ground. At the west end is the baptistery, and above that organ is placed. The nave is spanned



THE BOURSE, PARIS. SHEWING THE RECENT ADDITIONS.—M. CAVEL, ARCHITECT

Spence & Co., Ltd., Printers, 43 & 5 East Harding St., E.C.





THE BOURSE, PARIS SHEWING THE RECENT ADDITIONS.—M. CAVEL, ARCHITECT.
MAIN HALL, AND CORRIDOR, IN ONE OF THE NEW WINGS.



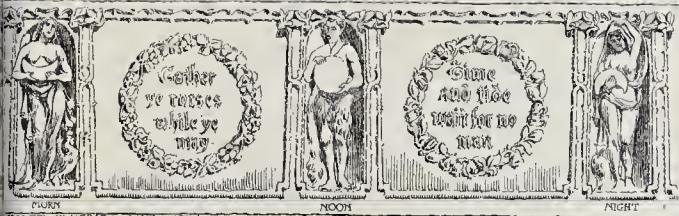


The Library



The Dining Room

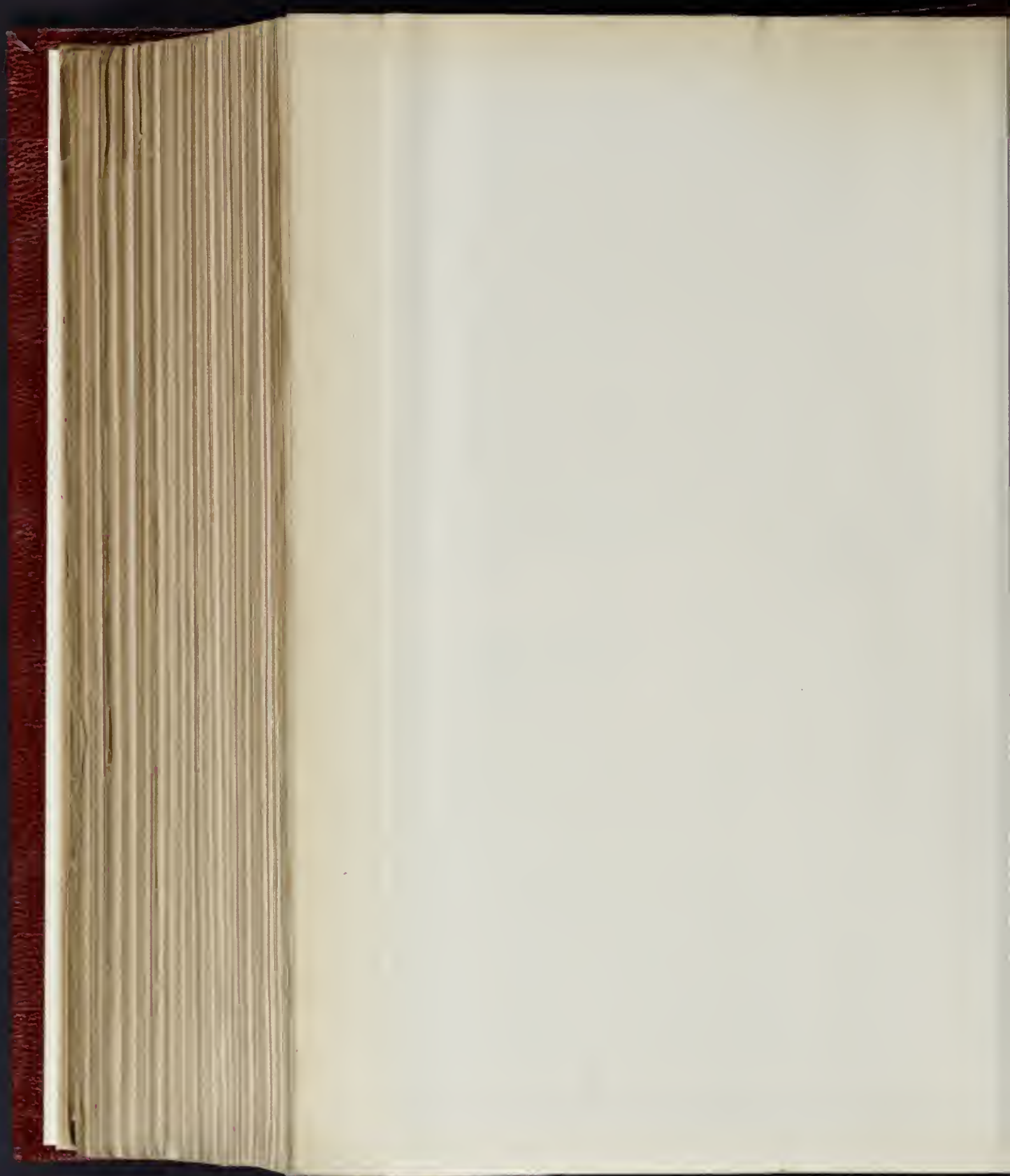
SHIPTON COVRT OXON



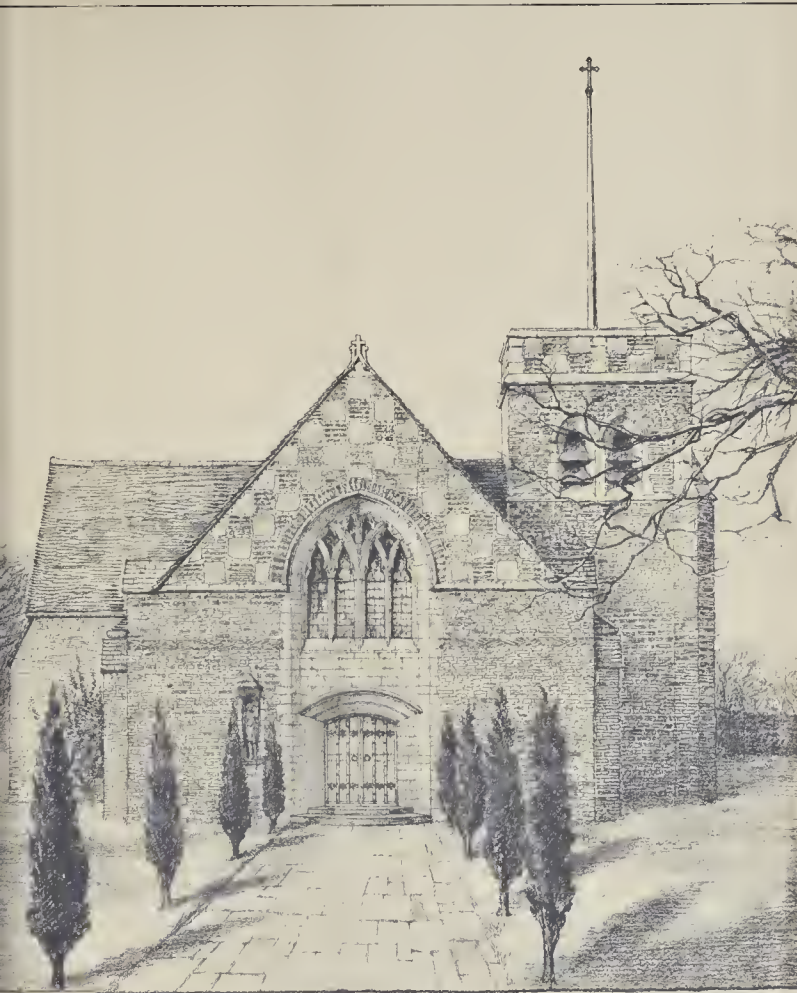
AS RESTORED FOR W.F. PEPPER ESQRE J.P
HENRY PERKIN FRIBA & GEO. B. VULMER FRIBA ARCHITECTS



The Hall



THE BUILDER, DECEMBER 10, 1904.



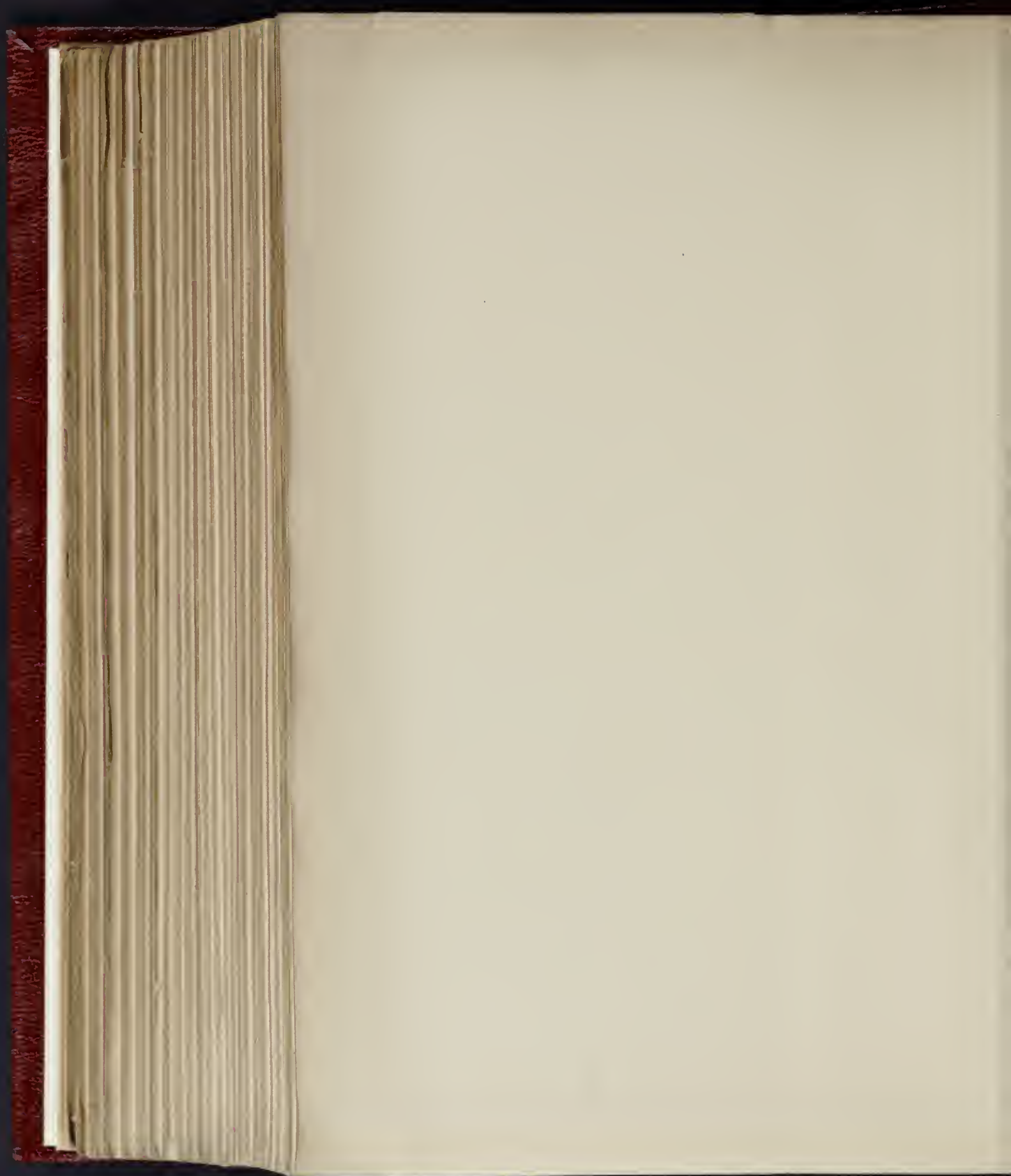
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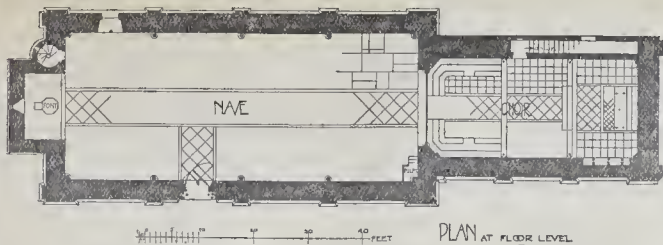
NEW CHURCH DEDICATED HASLEMORE. CHURCH OF S. CHRISTOPHER, OT IN SURREY. Charles Spooner architect.



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MEMORIAL CHURCH TO ARCHDEACON LIVINGSTONE, MALVERN LINK—MR. WALTER J. TAPPER, A.R.I.B.A., ARCHITECT.





Memorial Church, Malvern Link.

transverse stone groins, between which is a plaster barrel vault. The choir, three bays in length, is vaulted with stone transverse and diagonal ribs, with plaster filling. An arched clearstory runs the entire length of the church. Coupled lancet windows light the nave, the choir having single lancets. At the entrance to the choir is placed a wrought-iron hammered screen, partially gilt, and above this, at the springing of the choir arch, is the roof, of oak, stained and gilded. At the east end of the choir is a triplet lancet window, containing the subject of the Ascension, the treatment being that of single figures on grisaille work. Below is a painted triptych in red and gold, the centre panel of which contains a picture of the Virgin and Child, with attendant Saints in the surrounding panels. The triptych stands on a stone base, bearing the inscription, "O oriens splendor lucis aeterna veni et illumina," and a carved rose and rays in the centre, brought out by means of gold and colour. The festal frontal is of silk damask, with panels of the three archangels, Gabriel, Raphael, and Uriel, worked in silk on a gold ground, alternating with panels of gold arabesque. The font is of Irish grey marble, eight-sided, with detached shafts. A metal cover hangs from the vaulted ceiling, of copper, parcel gilt. Over the baptismal arch stands the figure of S. Michael. At the western face of the tower, externally, is a carved representation of the Ascension, with the inscription, "Ascendisti in altum cepisti captivitatem." The choir stalls, pulpit, lectern, and other fittings are of oak. The floors of the choir and baptismal are of black and white marble. The walls externally are plastered with a fair quantity of Guiting stone used for the dressings. Internally the latter are of Farleigh Down. The roofs are covered with stone slates. Adjacent to the church at its eastern end is the parish room.

Mr. W. J. Tapper, of London, was the architect, and the builders were Messrs. Stephens, Bastow, & Co., of Bristol.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Norwood.—(a) That the resolution of September 1, consenting to the erection of buildings on a piece of land on the east side of Poplar-walk and the south side of Feridene-road, Herne Hill, be rescinded; (b) that the Council do not consent to the erection of buildings on a piece of land on the east side of Poplar-walk and the south side of Feridene-road, Herne Hill, to abut also upon proposed new streets (Messrs. R. Ellis & Son for Mr. R. A. Sanders).—Agreed.

Lines of Frontage and Projections.

Hackney, South.—Additions to a building at No. 17, Sutton-place, Hackney, to abut upon Urswick-road (Mr. J. Hamilton for Mr. T. C. Wootton and Messrs. Barlow & Son).—Consent.

Haggerston.—That the application of Mr. G. H. Lovegrove for an extension of the periods within which the erection of a building upon the site of Nos. 225 and 227, Hackney-road, Haggerston, was required to be commenced and completed be granted.—Consent.

Kennington.—That the application of Mr. F. Hingston for an extension of the period within which the erection of bay-windows and a porch to No. 52, Priory-road, South Lambeth, was required to be commenced be granted.—Consent.

Norwood.—Six houses on a site abutting

upon the southern side of Park-road and western side of Clive-road, Norwood (Mr. P. Stock for Mr. G. E. Freeman).—Consent.

St. George, Hanover-square.—A projecting porch at No. 6, Upper Brook-street, Grosvenor-square, St. George, Hanover-square (Mr. R. Armstrong for Mrs. Seymour).—Consent.

Battersea.—That the application of Mr. M. Fitzmaurice for an extension of the periods within which the erection of a pumping station on a site abutting upon the east side of York-road and the north side of Creek-street, Battersea, was required to be commenced and completed be granted.—Consent.

Wandswoth.—A one-story building upon part of the forecourt of the premises of Messrs. Pickfords, Ltd., on the southern side of Grove-road, Balham (Mr. J. E. Beaumont for Messrs. Pickfords, Ltd.).—Refused.

Width of Way.

Bow and Bromley.—Buildings upon a site abutting upon the eastern side of High-street and southern side of Ammiel-terrace, Bromley, with external walls at less than the prescribed distance from the centre of the roadway of Ammiel-terrace (Mr. H. Heckford for the Council of the Metropolitan Borough of Poplar).—Consent.

Lewisham.—School buildings on the eastern side of Kelvin-grove, Sydenham Hill-road, Lewisham, with a forecourt fence at less than the prescribed distance from the centre of the roadway of the street (Mr. T. J. Bailey for the Education Committee of the Council).—Consent.

Formation of Streets, etc.

Lewisham.—That the application of Mr. H. Porter for an extension of the period within which the roadway of a new street to lead from Woolstone-road to Cranston-road, Lewisham, was required to be clearly defined throughout by posts and rails or so otherwise as the Council might permit and thrown open to the public as a highway, be granted.—Consent.

Hackney, Central.—That an order be issued to Mr. C. Winkley refusing to sanction the formation or laying out of a street for foot traffic only to lead out of the western side of Priory-place, Well-street, Hackney, the widening of a portion of Priory-place and the erection of buildings.—Agreed.

Space at Rear.

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the south side of Dunoon-road, Forest Hill, with an irregular open space at the rear (Mr. H. L. Upham for Mr. C. Walker).—Consent.

Lines of Frontage, Projections, and Deviation from Certified Plans.

Strand.—A building upon the site of Nos. 36 and 36a, St. James'-street, and No. 64, Jermyn-street, St. James', Westminster (Mr. W. Woodward for Mr. L. Thomas).—Consent.

The recommendations marked + are contrary to the views of the local authority.

APPOINTMENT.—The Shoreditch Borough Council, at their meeting on Tuesday last, appointed Mr. A. G. Cross, F.S.I., and member of the Quantity Surveyors' Association, of Old Queen-street, Westminster, their quantity surveyor in connexion with the rebuilding of the town hall, a portion of which was destroyed by fire in August last.

TASMANIAN WAR MEMORIAL.—A bronze statue representing a soldier in the field has just been shipped to Hobart for erection in the public park in memory of the colonists who served in the South African war. The statue is the work of Mr. Benjamin Sheppard, of Chelsea.

ARCHITECTURAL SOCIETIES.

THE LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society, on Thursday the 1st inst., Mr. Alexander McGibbon, of Glasgow, read a paper on "Byzantine Architecture." The justification for this subject, he said, was found in the current popularity of the style, notably in the new Westminster Cathedral and some of the paper designs for the Liverpool Cathedral, and a large number of students' competitions, and as a suggested counteraction to *L'Art Nouveau*, whose vogue can only be explained as a protest against the restraints of orthodox architecture. Designing architecture in "styles," as commonly understood, was defended by the lecturer. Byzantine architecture was described as Romanesque, modified in its principal features, and it has been defined as mediæval Greek. Whatever the first intention, in effect the style was one of interiors principally; for, as with many of the Italian Romanesque Churches, the exteriors were bald, but the idea seems to have been marble veneer. Rustication was not employed, but the traditional Romanesque use of tiles brought about the first appearance of polychromatic architecture. The constructive methods were ingenious, but not perhaps, for modern builders, very instructive. An interesting point was that truth in architecture was much more in evidence then than with Gothic or Renaissance builders, for semi-circular vaults were not sheltered under a wooden roof, and there was no false dome. When height was wanted, the later usage was to elevate the dome on a drum, but still the form that was seen internally was that of the exterior. The absence of mouldings was noticeable, but suggestive to present-day designers. Of their mosaic little need be said, and they were of glass rather than marble or encaustic tesserae. The carvings in capitals were very characteristic, largely influenced by drill work, and the decorative effect realised in flat surface treatment was more like painting or inlay than carving of the bossy sort we are accustomed to. The ornament was taken from metal work, but the transference to another material was not allowed to influence the form. A number of lantern slides, illustrating the various points of the lecture, were shown on the screen.

ARCHITECTURAL SECTION OF THE GLASGOW PHILOSOPHICAL SOCIETY.—At a meeting of the Architectural Section of the Royal Philosophical Society of Glasgow, held on the 28th ult., Mr. Neil McWhannell, the President, in the chair, Mr. Samuel Smith, clerk of works at the new Technical College Buildings, read a paper on the "Decay of Stone in Buildings." After introducing the subject, Mr. Smith said that decay in buildings, in a great many cases, might be attributed to the cementing materials of the stones being of clay, on which the action of frost has a disintegrating effect. The stones, which showed no signs of decay on examination, would be found to be covered with a hard skin which protected them from atmospheric action. In every stone when it was newly quarried there was a certain amount of moisture or natural sap. In many cases, where the binding material had been of a felspathic nature, this moisture had in solution a quantity of one of the alkaline silicates. As the sap dried out the soluble silicate came to the surface of the stone, when by the action of the carbonic acid in the atmosphere it was decomposed, and a coating of insoluble silica was deposited on the surface of the stone. This coating protected the stone from atmospheric action, thereby preventing decay. It did not always follow that a stone which showed good weathering qualities when built in the district in which it had been quarried would possess the same good qualities in every district. Cleopatra's Needle stood the Egyptian atmosphere for 2,000 years, but commenced to decay immediately after its erection in London, and there were similar results with stone built in Glasgow. In the author's opinion, the chief cause of decay in Glasgow was the amount of sulphur acids in the atmosphere. These acids attacked very readily stones of which the binding material was the carbonate of lime or magnesia. A practical proof of this was to be seen, until the erection of a verandah a few days ago, at the exit from the Central Low Level Station, on the west side of Hope-street, the masonry above the doorway all showing signs of decaying very badly; while on the other parts of the building there was very little if any decay. Passing on to discuss the question

as to what stones were the most suitable to use for buildings in Glasgow, he said that in a sulphur-laden atmosphere the stone with the smallest percentage of carbonates had been found to be the least liable to decay, provided that the physical properties of the stone used were in proper order. These conditions were best met by the red sandstone from that part of Dumfriesshire which lies between Thornhill on the north and Dumfries on the south, and includes Catelowbridge, Closeburn, Corncockle, and Locharbriggs Quarries. On some of the older buildings in Glasgow the signs of decay were not so marked as in new buildings. At the time these buildings were erected the city of Glasgow covered a very small area, compared with what it did now, and the sulphur acids would be very quickly diffused among the purr air of the surrounding country districts. The stone with which some of the older houses were built was taken from local quarries, and on analysis had been found to contain less carbonates than the majority of the white stones in use at the present time. The paper was brought to a close by some remarks on the nature and application of various preservatives.

Mr. James Stark said that Mr. Smith had brought forward many reasons unsettling his belief that carbonic acid, dissolving the carbonates, especially of lime, was the cause of the decay of buildings in Glasgow. He would not like, however, to offer a decided opinion on the subject. Mr. David Chalmers said that they were all agreed that both the old red sandstone and the carboniferous rocks readily decayed, especially those of the quarries round Glasgow. But the question was where were they to find a substitute? He did not think it was in the red rocks of Dumfriesshire, as some of the buildings erected with stones from these quarries already showed considerable signs of decay. Dr. R. M. Buchanan did not agree with the theory propounded. In the first place, he said there was difficulty in realising how these sandstone rocks were originally disintegrated without a change of a bio-chemical character. This raised a doubt in his mind as to the feasibility of the view that free carbonic acid was the agent in the disintegration of stone in buildings in Glasgow. If sulphuric acid was the agent, why was not the whole surface not washed by rain decayed? The localisation of the decay suggested that they had to deal with a process not purely owing to atmospheric conditions, but to a process under the control of vital agencies. His view was that decay was primarily due to living organisms in the stone. These living organisms broke down the stone, liberating sulphates, which readily combined with the sulphuric acid in the atmosphere, and which were then built up again. He admitted, however, that without carbonate in excess the process of decay would not go on.

SHEFFIELD SOCIETY OF ARCHITECTS.—A meeting of this Society was held recently in the Society's room, Leopold-street, when Mr. J. R. Wigfull lectured on "The Lanct Period of English Architecture." He urged the necessity of studying the history of a country side by side with its architecture. In illustration of this he pointed out that in the middle of the XIIIth century what is now France was divided up into a number of separate provinces, about half of which were under the government or indirect control of the King of England. To say, therefore, that Gothic architecture was the invention of the French was misleading if one regarded France in its modern aspect of one country and one people. By the help of plans of various cathedrals the lecturer showed that, although starting from one point, the architects of England and France worked on more or less independent lines, and by the commencement of the XIIIth century each evolved a distinct type, as shown in the contemporary cathedrals of Amiens and Salisbury. He pointed out that the plans of our English cathedrals were largely influenced by the monastic desire for a large presbytery, while the great cathedrals of Central France, intended more for general worship, were quite different in arrangement. The lecturer then dealt with the introduction of the pointed arch, showing that the difficulty of vaulting oblong and irregular spaces with the round arch led to the use of the pointed form, one which, while more readily adapted to varying spans, had the advantage of being better constructionally. The general design of various features of the buildings of the period was described and illustrated by slides from photographs and measured drawings made by the lecturer, who laid stress on the desirability

of studying a portion of a building, such as a bay or the end of a nave, choir, or transept, as a whole, and not merely a small feature separated from its surroundings in the way common amongst many students. On the motion of Mr. C. Pawsou, seconded by Mr. F. H. Wrench, and supported by Messrs. H. L. Paterson, E. M. Gibbs, and W. G. Buck, a hearty vote of thanks was accorded to Mr. Wigfull for his lecture, which was illustrated by lantern slides, exhibited by Mr. J. Atkinson, of University College.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—There was an exceptionally large attendance at the meeting of this Institution held at the Westminster Palace Hotel on the 3rd inst., the Chairman, Mr. Samuel Cutler, jun., presiding, when a paper entitled "Some Points of Interest on Torpedo Boat Construction" was read by Mr. H. E. Yarrow, Stud. Inst. C.E., of Poplar. Commencing with considerations with respect to the hull, the author showed the importance of realising in the design the maximum strength with the minimum weight, uniform elasticity throughout its length being essential. Any sudden change of section in these lightly constructed vessels formed a source of great danger, and it was quite possible, by adding material, to reduce the actual strength. It was of great importance to minimise vibration as much as possible, and the author illustrated by means of lantern slides the effect of a properly balanced engine on the stability of the boat itself. With the use of high pressure steam the paper showed how imperative it was to specially consider the best practice relating to steam pipes, those of small diameter being recommended for various reasons, amongst them being superheating of the steam and ensuring that each boiler was developing approximately its proper proportion of the power required. Referring to steam turbines, the author held that, although they possessed many advantages over reciprocating engines, they could not be regarded as economical for varying speeds as in torpedo boats. He alluded favourably to the explosive type of engine, which was developing so rapidly at the present time.

COMPETITIONS.

Y.M.C.A. PREMISES, PAISLEY.—The Building Committee of the Paisley Young Men's Christian Association have now accepted the plans for the new buildings to be erected by them at High-street and New-street. In connexion with the buildings, several local architects had sent in competitive plans, which were submitted to Mr. H. E. Clifford, architect, Glasgow, as adjudicator. Mr. Clifford awarded first position to the plans of Mr. T. G. Abercrombie, architect, Paisley, whose designs the Building Committee have now adopted. Mr. Abercrombie's plans show a four-story building in High-street, consisting of shops, offices, and rooms, with main entrance to the institute, and there is also a building to the rear with frontage in New-street. In the latter building there is to be a hall capable of accommodating 500, and the classrooms, clubrooms, janitor's house, etc., will also be in the rear premises. The buildings, including site, are estimated to cost between 10,000l. and 12,000l.

BOOKS RECEIVED.

PAPERS OF THE BRITISH SCHOOL AT ROME, Vol. II. By T. Ashby, jun., F.S.A. (Macmillan & Co., 30s.)

ENGLISH METAL WORK: Ninety-three drawings. By W. Twopeny (1797-1873), with a preface by Laurence Binyon (Archibald Constable & Co., 15s.)

THE TABERNACLE: ITS HISTORY AND STRUCTURE. By the Rev. W. Shaw Caldercott (The Religious Tract Society, 5s.)

ARBITRATIONS. By Banis'er Fletcher, F.R.I.B.A. Third edition. (B. T. Batsford, 5s. 6d.)

THE CONDUCT OF BUILDING WORK. By J. Leaning, F.S.I. Second edition. (B. T. Batsford, 2s. 6d.)

THEATRE, CARDIFF.—A new theatre is to be erected in Park-place, Cardiff, from plans prepared by Messrs. Ernest Runtz & Ford, London. The new theatre will be constructed of red brick, with terra-cotta mouldings. The auditorium will accommodate about 2,000 persons. The stage will be 70 ft. wide by 45 ft. deep, and there will be twenty dressing-rooms.

Correspondence.

THE JOINERY TRADE.

SIR.—Your correspondent, "A London Builder," complains that he cannot produce doors, sashes, frames, etc., at prices that will compete with those of foreign manufacturers. A great deal depends on the quantity he puts in hand. Of course, he could not make two or three of each at prices anything like what he could buy foreign. But if he can not produce joinery in quantities of, say, 20 or 300 at a cost considerably less, and of much better quality than anything that comes from abroad, there must be something wrong with his management. A short time ago we required a quantity of 2-in. doors of a certain size. Being rather slack, we decided to make them, and the result was that we were able to produce for 18s. 2d. what would have cost us 22s. 6d. had we bought foreign. I could name several large works in London where joinery such as he mentions is made to such profit that the proprietors are laying down special plant for this purpose. I agree with him that the local rates and the requirements of the Factory Act form a severe handicap to the London manufacturer, but to fall to see how the tax he proposes would help him, most of the imported joinery being made cheaply at the large converting mills in timber-producing countries. The manufacturer who sends the joinery your correspondent complains of likewise sends the timber which constitutes our raw stuff, so if we put a tax on manufacturing goods, it simply follows that the manufacturer will raise the price of his raw stuff against us which would mean a raising of prices all round to benefit nobody. The organisation of business which allows of no waste either of time or material, and the cutting of all unnecessary expenses are the principal factors in getting work out cheaply.

A SHOP FOREMAN.

FIRE-RESISTING FLOORS.

SIR.—Adverting to Mr. E. O. Sachs' letter in your issue of the 3rd inst., the words he used when writing on the lessons of the Baltic more fire were:—"The necessity of prohibiting the use of terra-cotta hollow floors with thin webs in such classes of buildings, unless the superimposed concrete filling is self-supporting, and the terra-cotta tiles used merely to take the place of centering."

Mr. Fawcett anticipated all this nearly seventeen years ago by his patent of February 25, 1838, and we have made this form of floor ever since. We do not see why we should not call attention to the fact by advertisement, if we think proper to do so.

BRETT A. ELPHECIE
(for Mark Fawcett & Co.)

PROPOSED NEW POLICE AND FIRE STATIONS, BRISTOL.

SIR.—As most of your readers are aware, in this competition no professional assessor is to be appointed, and both the Institute Committee and Competition Reform Society have issued notices to their respective members that, for that and other reasons, the conditions are unsatisfactory.

I should like to supplement this by stating that the Council of the Bristol Society of Architects, has, through the President and Hon. Secretary, addressed a circular letter to each member of the Watch Committee pointing out (1) that in the very large majority of architectural competitions promoted by public bodies, such a professional assessor is engaged, and consequently, the confidence of intending competitors is secured; (2) that a very large proportion of architects have, for a considerable time past, engaged to abstain from all public competitions in which no assessor is appointed, and that numbered amongst their ranks are nearly all the well-known architects of eminence in various branches of their profession; it is evident, therefore, that the designs submitted will not be likely to be of a high order if the majority of the best men are excluded; (3) in the recent competition for the Bristol Central Library a professional assessor was appointed, and that we believed that the principle of appointing an assessor had been adopted by the Bristol Corporation for all succeeding competitions, and it is a source of much disappointment to us that, in this instance, the principle for which the architectural profession contends so strongly has been departed from.

It was also added that architects outside the district should have confidence that no local bias has in any way affected the decision, and that this confidence was obtained by the appointment of an independent professional assessor.

An examination of the site plan issued with

show that no details of the existing police courts are given; these were recently added to by a local architect, and there would have been no difficulty in obtaining information so essential to competitors, the absence of which must place them at a great disadvantage.

We think, sir, that these facts will be sufficient to show that all self-respecting architects will be wise loyally to conform to the request of the R.I.B.A. not to enter a competition of so unsatisfactory a character.

GEORGE H. OATLEY, President.
H. DARE BRYAN, Hon. Sec.
Bristol Society of Architects,
Fine Arts Academy, Bristol.

A MYSTERIOUS COMPETITION.

SIR.—It would be interesting to know if any of your readers have news of a mysterious competition, the drawings for which were sent in nearly six months ago. It was for alterations to the Shire Hall, Bury St. Edmunds, and the County Surveyor, Mr. Ainsworth Hunt, was to be the assessor. One guinea was paid for the particulars. No information is forthcoming as to what has been done except that Mr. Hunt has been ill. If this illness has lasted six months, is it not about time that the Council appointed another assessor? Such proceedings are hardly courteous to the competitors.

I would suggest that the competitors should take some strong and joint action in this matter. I enclose my card. MYSTERIFIED.

The Student's Column.

ASPHALT: ITS COMPOSITION AND PROPERTIES.—I.

THE use of asphaltic materials for a variety of architectural and engineering purposes is increasing year by year, and it is to give some account of the origin, preparation, composition, and characteristic properties of the various forms that this short series of articles is written. The mode of application of asphalt to roadways, and of bitumen for securing watertight qualities, has received attention in engineering circles and been recorded in the technical press, and this aspect will therefore not be dealt with except so far as is necessary to explain the distinctive properties of the several substances. It will, however, be seen, as the subject unfolds, that the lessons of practical work are, of the first importance, and that, valuable as is the information furnished by mechanical or other tests, they must be associated with experience of the same material under working conditions. As, however, the sources of supply of asphaltic materials are continually enlarging, and include not only new specimens of natural products, but also of artificial imitations, it becomes necessary to have aids in discriminating their worth.

To be able to do this, it is necessary to describe the behaviour of materials of proved value for the purpose in question, to describe the various adulterants or inferior substances that are likely to be met with, and give, as far as present-day information will allow, the means of separation and estimation of the desirable constituents.

The two distinctive qualities of asphaltic materials are (a) elasticity and (b) imperviousness to moisture, and they are in direct antithesis to the qualities of concrete. The two materials are correlative; they have their separate functions, which when applied each in its proper place may combine to produce the most useful effect.

The difference in elasticity is made use of in the construction of foundations to steam hammers, engines, heavy machinery, etc., where vibration has to be absorbed. This may be accomplished by building (a) layers of good concrete, alternating with sheets of bitumen, (b) building in bituminous concrete, (c) filling into a steel framework compressed asphalt rock powder. On the other hand, the elastic nature of asphalt, which keeps it from cracking even under considerable changes of temperature, requires that it shall be supported by an unyielding foundation such as is secured by good Portland cement concrete; and it is upon this fact that success in asphalt pavements and in watertight layers largely depends. Wherever a pressure of water has to be resisted, that must be opposed by concrete or other equivalent, the accommodation to changes of shape and the prevention of percolation being supplied by the asphalt.

The "accommodation" of asphalt is the reason of its long life under heavy street traffic, it having been found that compressed asphalt is always more dense in the upper layers than the lower, even when the thickness has been reduced by wear to only $\frac{1}{2}$ in. thick. The surface which receives the shock of the vehicular traffic, therefore, always rests on a cushion, and is elastic to the tread of animals.

Asphalt paving was first introduced in Paris in 1838, and its use has now become so extended as to require annually 600,000 tons of the natural rock, in addition to the substitutes made in Europe and America. The experience gained in the early years of the industry have been set forth in the volume published in 1886 by M. Leon Malo, and in the papers read by Mr. W. H. Delano before the Institution of Civil Engineers (see vols. 43, 60, and 152 of their Proceedings), and this information forms the groundwork of our knowledge of the utility of the natural materials.

As applied to roadways and footpaths, these materials fall into two classes:—(a) Compressed asphalt powder, (b) asphalt mastic.

The first is the natural asphalt rock ground to fine powder, and must be of such composition as will agglutinate its particles under the pressure and heat of the hot iron tools used for ramming. It is essentially a base of pure limestone impregnated with a minimum of 10 per cent. of bitumen.

The second is the same material as the first, but to which a quantity of bitumen has been added to make it liquefy at a moderate temperature, and enable it to be floated and worked under trowels.

It is convenient in studying natural rock asphalt clearly to comprehend that it is dependent upon two leading factors, the first of which is occasionally sandstone but generally limestone in a pure and finely divided state, and the second of which is "bitumen," a term used to express those organic substances which give it the distinctive properties of agglutination, elasticity, etc., and which are found to be soluble in bisulphide of carbon. Ideal asphalt for a compressed roadway is composed of pure limestone uniformly impregnated with 9 to 10 per cent. of bitumen, non-evaporative at a temperature of 428° Fahr. Bitumen, as shown by Boussingault, is composed of carbon 85 parts, hydrogen 12 parts, and oxygen 3 parts by weight, corresponding approximately and empirically to the formula $C_{85}H_{12}O_3$. It is found almost pure in various places, as will subsequently be described, but "pure bitumen" is not the constituent which is exclusively desired in the mixture known as natural asphalt.

What is required is a mixture of substances of the bitumen class such as shall give a suitable melting point, with an absence of brittleness, and shall do this without deterioration under the changes of atmospheric temperature and exposure that will come upon it.

These bitumen-like constituents extend on the one hand towards the nature of petroleum and on the other towards pure bitumen, which has its natural prototypes in the manjak of Barbados and in the veins of New Brunswick and Benheim in Hanover. The oil-like components tend to decrease the melting point, but if present in excess cause creeping under changes of atmosphere and abrasion of wheel traffic, whilst the "pure bitumen" tends to brittleness and to a considerable increase in the melting point. It is upon the respective proportions of the intermediate components, and their total percentage in the asphalt rock, that its behaviour depends. These facts have been slowly evolved by repeated investigations by chemists in Europe and America, made for the purpose of learning the synthesis of the natural material and how it might be artificially reproduced; but the first researches were made by a means which stated the result as bitumen without any fractionation—viz., by extraction with carbon bisulphide. For the manufacture of asphalt mastic, bitumen must be added to the natural rock after grinding, and for this purpose "Trinidad Lake asphalt" is found to be the best, because of its composition, which corresponds more or less completely with the mixture of bitumens in the European rock asphalt.

There are, however, on the Island of Trinidad every shade and variety of asphalt, from petroleum to manjak, and it is that found in La Brea (the Spanish term for Pitch Lake) that is found to be the most satisfactory for blending. How far this is a pure mixture of bitumen will be seen from the analyses to be given later.

WESTMINSTER CITY COUNCIL.

The usual fortnightly meeting of this Council was held at the City Hall, Charing Cross-road, on Thursday last week.

Workmen's Hours of Labour.—The General Purposes Committee, having again considered this question, recommended that the existing hours of labour of employees in both the Works and Highways Departments be not altered, and that the City of Westminster Municipal Labour Union (who petitioned the Council for a revision) should be informed accordingly. This was agreed to.

Haymarket Electric Railway Station.—The Works Committee reported that they understood from the plans of the proposed alterations in the lifts at this station that passengers would alight from the four exit lifts only 6 ft. from the old street line in Jermyn-street. The footways of that thoroughfare were narrow, and as it appeared to the Committee that there was a likelihood of serious inconvenience being caused to pedestrians, they had drawn the attention of the London County Council to the matter.

Metropolitan Paving Committee.—On the recommendation of the Committee Alderman Emden was reappointed the Council's representative on this Committee for the ensuing year.

Piccadilly Widening.—After a long discussion on a further report of the Improvements Committee on this matter it was agreed to inform the London County Council that the City Council was prepared to contribute an amount equal to one-seventh of the total cost, the recommendation of the Committee that no increase should be made in the contribution being lost.

District Surveyors and Plans of Drainage Work.—The Public Health Committee reported having received a letter from the London County Council, dated November 18, in reply to the City Council's letter of July 15 last, suggesting that district surveyors, in all cases in which plans of new buildings submitted to them include proposed work which is subject to the supervision of the sanitary authority, should call the attention of the persons submitting such plans to the fact. The County Council stated that in March, 1899, copies of a notice drawing the attention of builders and others to the fact that the district surveyors had no control over matters relating to the sanitary arrangement of buildings, in respect of which the approval of the local authority was necessary, were sent by the County Council to district surveyors for exhibition in their district offices; that they did not feel that they could require district surveyors to undertake the duty of specially examining plans with a view to ascertaining whether or not notice was required to be given to the sanitary authority; but that, with a view, however, to meeting as far as possible, the wishes of the City Council, they had given instructions for further copies of the notice above referred to to be sent to each district surveyor.

OFFICIAL ENGINEERS AND SURVEYORS AND ARCHITECTURAL WORKS.

The Royal Institute of British Architects have sent the following memorial to various public bodies:—

"That whereas the employment by county or municipal authorities of their officials to execute works of architectural importance is a matter involving grave interests of an artistic, practical, and financial nature, it is for the general welfare of the community that such employment should be regulated by certain conditions.

The Royal Institute of British Architects and the Allied Architectural Societies respectfully beg leave to point out:

- (1) That when the official is an engineer or surveyor, the artistic aspect of buildings designed by him is apt to be overlooked or misunderstood by reason of his not having received the artistic training of an architect.
- (2) That the engineer or surveyor in planning and arranging buildings is fettered by the lack of expert knowledge possessed by architects.
- (3) That greater expense is incurred by employing an engineer or surveyor than by employing an architect. Non-expert planning entails unscientific distribution, and consequent expense in construction, often leading to subsequent alterations which involve waste of public money, the amount of which is impossible to be ascertained owing to the complicated nature of official departments. The saving of an architect's fees is undoubtedly false economy. It is the function of an architect to obtain for his client the best value for money expended, which special experience, not possessed by an engineer or surveyor,

alone enables him to do; further, his independent position compels him to exercise a closer control over expenditure than the salaried official, whose purely personal interests are not intimately involved.

(4) That the time of a county or municipal official is so greatly occupied with administrative work that it is impossible for him, when entrusted with any building scheme of first-class importance, to devote the requisite attention to the essential considerations of artistic design, expert planning, and economic building. Such work is inevitably referred to irresponsible assistants, and an unsatisfactory and expensive building is the result.

The Royal Institute of British Architects and the Allied Architectural Societies therefore respectfully and earnestly urge upon county and municipal authorities:—

(1) That architectural work be not placed in the hands of engineers or surveyors.

(2) That where it is deemed desirable for architectural work to be carried out by a county or municipal official, such official shall be required to have passed the qualifying examinations of the Royal Institute of British Architects.

(3) That the work of an official architect be restricted to structures of secondary importance, and that all buildings of a monumental character be entrusted to independent architects to be selected in such a way as may seem best to the local authority.*

COURT OF COMMON COUNCIL.

THE Lord Mayor presided over a meeting of the Court of Common Council at the Guildhall, on Thursday last week.

The Proposed Embankment Tramways.—Alderman Sir Charles Bell presented a petition from the president and court of governors of Sion College against the proposal for a tramway along the Victoria Embankment. The petition was referred to the Streets Committee.

Memorial from the R.I.B.A.—A memorial from the Royal Institute of British Architects and the allied architectural societies in favour of the employment by county and municipal authorities of architects in the planning and arranging of buildings was referred to the General Purposes Committee.

The City Engineer.—On the recommendation of the Officers' and Clerks' Committee it was agreed that Mr. D. J. Ross, the Engineer to the Public Health Department, should retire (on account of ill-health), and that a retiring allowance of £500 per annum should be made to him during the pleasure of the Court. A lengthy discussion on the duties of the engineer and surveyor ensued, the Committee having come to the conclusion that these should be separate offices. Ultimately the matter was referred to the Streets and the Improvements and Finance Committee.

OBITUARY.

MR. FERGUSON.—We much regret to announce the death, on December 1, at his residence, Caldew Lodge, Carlisle, of Mr. Charles John Ferguson, F.S.A., in his sixty-fifth year. Mr. Ferguson, who practised as an architect and surveyor at No. 50, English-street, Carlisle, and in Kensington, S.W., was, with his brother, the late Richard Saul Ferguson, M.A., F.S.A., Chancellor of the Diocese, a son of the late Joseph Ferguson, M.P. for Carlisle in 1852-7. He was a county magistrate for the Cumberland Ward. On leaving Shrewsbury School Mr. Ferguson was articled to the late Mr. Cory, of Carlisle, with whom he afterwards entered into partnership under the style of Cory & Ferguson, baving, in the meantime, been employed in the offices of Sir George Gilbert Scott.

He was elected an Associate of the Royal Institute of British Architects in 1864. Of Mr. Ferguson's principal architectural works we have published illustrations of the following:—Naworth Castle, additions and alterations for Mr. George Howard, M.P., comprising the Stanley Tower, external courtyard, kitchen offices with bedrooms above, two new staircases, and refitting of the library and music and billiard rooms (March 10, 1863, and September 19, 1865); the extensive additions, at a cost of some 20,000*l.*, to Tullie House, Carlisle (1865), purchased by the Corporation in 1860 for its adaptation for purposes of a school of science and art, public library, and fine art gallery and museum (May 9, 1891; and January 20, 1894, Castle-street entrance); Seascale Church, Cumberland (January 16, 1892); Badsworth Grange, Yorks, for the Misses Heywood-Jones, of Badsworth Hall (June 8, 1895); Clive Church, near Grinshill quarries, Shropshire, general restoration, with new chancel and oak

screens, vestries, tower, and spire (July 3, 1897, with two views of the interior as restored and refitted, and March 5, 1904, perspective view); and his drawn plan of Lanercost Priory, Cumberland, which formed the basis of one made by Mr. E. Ridsdale Tate (October 1, 1898—No. XXVII. of our "Abbeys of Great Britain" series). Amongst his other more important works, we should mention the extensive alterations and improvements he carried out for Lord Armstrong, at Bamborough Castle, of which he exhibited a notable model in the Royal Academy rooms, and which we fully described and illustrated with a plan in our issue of May 30, 1896; Edenhall; and Muncaster Castle. Mr. Ferguson prepared the plans and designs for the enlargement of Milton Hall, Cumberland (1886-7); the smoking-room at Dovenby Hall; the new wing and additional story, Town Hall, Carlisle (1897); the repair and restoration of Moilard Church, Westmorland, with new vestry, stalls, and roof; the column for the memorial to the late J. R. Creighton, erected at the south end of Eden Bridge, Carlisle, in 1893; the restoration of St. Mary's Church, Gosforth; the mission-room, Newtown, Carlisle; Garden House, Fairlaw, Kent; St. Aidan's Church, Warwick-road, Carlisle, with parish rooms and paragonage; the enlargement of "Tynholme," Howard-place, Carlisle, for Mr. F. Robinson (1899); the rebuilding of the central block, University College, Aberystwyth, after the fire in 1885, for the science "side," with laboratories, lecture-rooms, etc., and the official rooms of the college; the new church, Savile Town, Birtley, near Dewsbury, of which the first portion, for 500 sittings, was completed in July, 1900; and Stone Church. Amongst Mr. Ferguson's earliest works are Holy Trinity Church, Bournemouth, cruciform on plan with an apsidal chancel, designed after the Lombardic manner, in 1849; and, with his partner, the two wings of the Cumberland Infirmary, Carlisle. In conjunction with his brother, he was the author of a historical and architectural account of Lanercost Priory, of which fabric he restored the nave and the buildings on the west side some years ago. Mr. Ferguson contributed many papers upon kindred topics to the *Translations of the Cumberland and Westmorland Archaeological and Antiquarian Society*.

We regret exceedingly to have to announce the death, at the early age of thirty-seven, of Mr. F. W. Bedford, an architect whose name is well known to our readers, and whose buildings have often been illustrated in our pages. Mr. Bedford was the head of the firm of Bedford & Kitson, of Leeds, but about a year ago removed to London, though the firm still retained their offices at Leeds. Mr. Bedford was a son of the late Mr. James Bedford, manufacturing chemist, of Leeds, and was articled to Mr. William Thorp, of that city, and, upon the expiration of his indenture, he entered the offices of Messrs. Ernest George and Peto, of London. He subsequently won the Owen Jones scholarship at the Institute of Architects. He started in practice in Leeds in 1892. His early work included "two houses in the old gardens, Headingley, Leeds," two houses, Shireoak-road, Leeds; another house, Shireoak-road, Leeds; "alterations to Meyland House, Leeds; *gymnasium at St. Peter's School, York; *Dalguise, Harrogate; *Braham, Perth (a large house for Mr. R. D. Pullar); *Westwood Croft, Leeds. In 1897 he took Mr. Kitson into partnership. Their formal partnership ceased last year, when he migrated to London, although they continued to act in conjunction in certain work. Other buildings that he carried out were: House in North Hill-road, Headingley; "alterations, resating, and decoration of St. James' Church, Leeds; branch banks for the Yorkshire Banking Company, Ltd., at *Thirsk, *Ripon, *Middlesbrough, *Hunslet, and *York; the "Leeds Overseers' offices (alterations and additions); *St. Aidan's Vicarage, Leeds; "All Hallows Vicarage, Leeds; additions to Shadwell Grange, near Leeds; "Red Court, Scarborough; Free Library, Police Station, and Fire Station in Dewsbury-road, for the Leeds Corporation; the Leeds School of Art; the Leeds Public Dispensary; Red House, Chapel Allerton, Leeds; Webton Court, Chapel Allerton, Leeds; Pen-y-Bryn, Chapel Allerton, Leeds; "Aros," Chapel Allerton, Leeds; business premises, Willington-street, Leeds (alterations and decorations). Since going to London he won the second premium in the Newcastle Grammar School competition, and he designed a new organ case for Headingley Hill Chapel (in this year's R.A.), and he was engaged in other work at the time of his death.

*The asterisks denote those which have been illustrated in our pages.

DR. DRESSER.—We regret to hear of death, at Mulhouse, Germany, on 24th ult., of Dr. Christopher Dresser, of E. Bank, Barnes, London. Dr. Dresser had been well known as a decorative designer, and worked largely in producing designs for textile manufacturing firms. Christopher Dresser was born in Glasgow on July 4, 1854, of Yorkshire parents. His parents remained but short time in Scotland, and, after a few moves, spent some years in Bandon, Co. Co., and here he received all the little schooling he ever had. When about thirteen years of age they all moved to London, and he was placed at the old School of Design at Somerset House. At fifteen he gained a first scholarship, and from that time made rapid progress in drawing. He then took drawing to illustrate botanical works, a taking a great liking for flowers he gave attention to the study of Nature, and became Lecturer on Botany in the Department of Science and Art, and also in the London St. Mary's Hospital schools. He wrote about this time (1860) several works on botany, including "Unity in Variety," "The Rudiments of Botany," etc. He issued his first work, art in 1862, the "Art of Decorative Design," and in that year made his first intimate acquaintance with Japanese Art through exhibits shown in the exhibition by S. Rutherford Alcock. Many of these he made drawings of, and at the end of the exhibit bought some of these specimens, and thus commenced the collection of art objects which he ever since been his pride. By the time of the Paris Exhibition, in 1867, he had become well known to the manufacturers of the country, and many of the wall papers, carpets, and textile fabrics shown there bore design from his pencil. In 1875 he spent some time in Vienna, and wrote for the Press many articles on Art from that city. In 1876 he started on his journey to Japan, travelling *via* America, and visiting the Philadelphia Exhibition on his way. He delivered a few lectures on Art while in the States. His travels in the land of the Rising Sun, and his keen appreciation of Japanese Art, an interest in the people are told in his book written soon after his return home. "Japan: its Architecture, Art, and Art Manufactures." In 1876 he spent much time in Paris, both one of the jurors in the Exhibition. Of his years he had devoted most of his time to preparing designs for manufacturers, and in the enjoyment of his garden and flowers. His works on Art, besides those already mentioned, include "Studies in Design," a "Principles of Decorative Art," a "Modern Ornamentation." He wrote various Art journals, and lectured on Art in many towns in this country. He was for many years a Fellow of the Linnean Society of London, and of the Edinburgh Botanical Society, and was granted the degree Ph.D. by the University of Jena for his discoveries in connexion with natural science. He was a most genial companion and interesting talker, and never tired of discussing Art and the habits of the nations of the East, trying to trace their histories by their ornamental forms as a philologist does by the language. His daughter, Miss Ada Dresser, who had assisted her father for many years, has retained his staff of assistants, and tends to carry on his work.

GENERAL BUILDING NEWS.

NEW TOWER, ROCHESTER CATHEDRAL.—The tower of Rochester Cathedral, which has been rebuilt, with the addition of a spire, at an outlay of upwards of 5,000*l.*, was recently dedicated. The new central tower and spire had been designed as far as possible on the lines of the original work of Hamo de Hyth. This bishop raised the tower by the addition of a belfry story, and capped it with a spire of oak, covered with lead. This tower was almost rebuilt in the XVIIIth century. In 1826 it was said to be in a dangerous condition, and was taken down by Mr. C. G. Canning, at that time architect to the Dean and Chapter, who replaced the old spire by a square tower with corner pinnacles. The tower is stonework, and the spire is of wood covered with lead. On the upper part, over the belfry windows, are four small niches containing figures of the Virgin Mary on the east side, Bishop Hamo de Hythe on the north, St. Andrew, the patron saint of the cathedral, on the west, and St. Paulinus on the south. On the face of the parapet above the figures is a cornice ornamented with carved foliage, and above the parapet twelve shields, three on each face, bearing the east side the coats of arms of the present bishop and the late dean; on the north side the arms of Bishop Hamo de Hythe and Mr. T. H. Poord, the builders of the old

new towers respectively; on the west side the arms of the City of Rochester, of the Cathedral, and the County of Kent, and on the South side the Royal Arms and the arms of Canterbury. A new clock and chimes have been added, while the peal of bells has been increased from six to eight, four of the old bells having been recast. The architect is Mr. C. Hodson Fowler, of Durham, and the contractor, Mr. S. F. Halliday, of Stamford.

CHURCH EXTENSION, CHARWELTON, NORTHAMPTONSHIRE.—The work in connexion with the enlargement and restoration of Charwelton Church, has been completed, and the building was reopened by the Bishop of Peterborough on the 16th ult. The alterations include an extension of the chancel eastwards, a new roof, built to much the same pitch as the other part, a new east window, etc. The interior has been panelled with oak to a height of 10 ft., and the vestry has been turned into an organ chamber. The tombs and brasses in the chancel have also been attended to. The contractor for the extension of the chancel was Mr. John Bosworth, and Mr. Archer, of Northampton, did the paneling. The south doors of the chancel, which are of oak, were the work of Mr. Franklin, of Heleidon. Mr. Cecil Fabian, sculptor, of London, carved the angels and the emblem of the Holy Trinity on the exterior of the chancel, and the architect was Mr. Christopher Carter, of London. The cost has been about 1,600.

GERMAN CHURCH, BROMPTON-ROAD, LONDON.—Count Bernstorff, German Minister in London, attended at the consecration, on the 27th ult., of a new German Evangelical church in Montpelier-place, Brompton-road. The pulpit was made and carved in Berlin. The coloured windows were the work of the glass painter to the Bavarian Court. Some of the windows came from Cologne. The electric light fittings were by Messrs. Drake, an English firm. Upon Mr. Charles G. F. Rees, the architect, the Emperor has bestowed the insignia of the Fourth Class of the Imperial Order of the Red Eagle.

WESLEYAN CHURCH, BUSHEY.—The foundation-stones were laid a short time ago of the new Wesleyan church, which is now in course of erection at New Bushey. The new building faces London and King Edward roads, and is being built by Mr. Charles Brightman, from plans prepared by Messrs. Bell, Withers, & Meredith. The structure is to accommodate 750 persons, and its erection involves an expenditure of 6,768.

CHURCH RESTORATION, LYNG, SOMERSET.—The reopening of the Lyng parish church, which has recently been restored, took place on the 22nd ult. The restoration has been carried out by Mr. H. J. Spiller, of Taunton, under the supervision of Messrs. Samson & Cottam, architects, of Taunton, at a cost of more than 600. While the restoration was in progress, an ancient door-keft was discovered on the north side of the church, and a piscina in the opposite wall, near the pulpit.

CHURCH, LEMINGTON, NORTHUMBRIA.—A new Methodist New Connexion church has been erected in Union Hall-road, Lemington, by Mr. Thirlwell, of Benwell, and Mr. Jackson, of Gosforth, from designs prepared by Mr. B. R. Irvin, architect, Gateshead. Accommodation is provided for some 350 persons.

WESLEYAN CHAPEL, SEDGLY.—The work in connexion with the reconstruction of the Wesleyan chapel at Sedgley has been completed, and the new building was recently opened. The premises now consist of a chapel, with stained-glass windows, a schoolroom, three classrooms, and a minister's vestry. The building work has been carried out by Mr. Tomkinson, Wolverhampton, to the plans prepared by Mr. W. de la Haye, Sedgley. The total cost of the scheme amounts to 1,620.

WESLEYAN CHAPEL, UPPER TOOTING.—The new Wesleyan chapel on the High-road, Upper Tooting, was recently opened. The site was secured at a cost of 3,000., and the building itself represents an expenditure of 11,675. The builders were Messrs. Johnson & Son, of Wandsworth Common, who carried out the work from the plans of Mr. James Gibson, architect.

BAPTIST CHAPEL, HADDENHAM, CAMBRIDGESHIRE.—The memorial-stones were laid recently of the new Baptist chapel at Haddenham. The site is on the north side of the village green, and the buildings are to include a church to seat 337 adults, or a mixed congregation of 450 persons, and vestries, cloakrooms, etc. The buildings will be in the late Gothic style, and the walls are to be faced with red bricks, and bath stone will be used for the spire and for the dressings to the doors, windows, etc. Provision will be made for the choir and organ in the south transept, and a small gallery at the front end. The baptistry

will be of marble, and will be placed in front of the rostrum. The two vestries, with the usual conveniences, will be at the rear. The Arrangements are to be made for heating by hot-water low-pressure system. The architects are Messrs. John Wills & Sons, of Derby and London, and the contract for the work has been placed with Mr. H. Feast, of Haddenham. The cost of the building, exclusive of the land and architects' fees, is estimated at 2,500., and the total outlay involved is put down at 3,200.

A ROWTON HOUSE FOR NEWCASTLE-ON-TYNE.—The prospectus of the Northern Rowton Houses, Ltd., was issued on the 21st ult. The company has been formed for the immediate purpose of acquiring a site in Newcastle, and erecting thereon a building to be used for the housing of the working classes, and also to acquire other sites for a similar purpose in Newcastle and the northern counties, such establishments being similar to those known as "Rowton Houses." In the first place, it is intended to erect a house capable of accommodating 250 men on the Dog Bank, at the foot of Pilgrim-street, according to plans prepared by Mr. J. C. Maxwell, architect, which have already been passed by the Town Improvement Committee. The site of the proposed building has a frontage of 162 ft. to the Dog Bank and 49 ft. to Pilgrim-street, and contains an area of 1,000 sq. yds. It will contain a separate residence for the superintendent and an office; entrance hall, with shop for the sale of goods to the lodgers; dining-room, recreation-room, reading-room, smoking-room, kitchen, and 250 cubicles, lodgers' scullery, lockers, baths, foot-washing troughs, lavatories, wash-house, and other conveniences, with separate accommodation for the caretakers and bedmakers. The premises will be lighted throughout by means of electric light, and be heated by means of a low-pressure hot-water system. There will also be a disinfecting chamber. The charge for each lodger will be 6d. per day.

CLUB, BOSCOMBE, BOURNEMOUTH.—The new men's club in connexion with the parish of St. John's was opened recently. The new club premises are situated in the Shelley-road, and consist of a recreation-room (which portion was formerly used as the St. John's Mission Hall), a reading-room, a billiard-room, a refreshment buffet, and bathrooms. The recreation and reading rooms are separated by a folding screen, and when thrown into one form a hall which will be available for use as a mission hall on Sunday evenings. The recreation-room is 49 ft. in length by 20 ft. in width, whilst the dimensions of the reading-room are 25 ft. by 19 ft. The billiard-room, which is beyond the reading-room, is 28 ft. in length by 19 ft. in width. In the basement, lavatory and bath accommodation has been provided. Mr. Charles T. Miles was the architect, and Councillor George Mitchell the builder.

BRADFORD TECHNICAL COLLEGE EXTENSION.—The sanction of the Board of Education to the proposed extension of the Bradford Municipal Technical College has been received by the clerk to the Bradford Education Committee. A report upon the proposed extension was submitted to the City Council at their October meeting. This report, which was drawn up by Professor Barker and Mr. Whitehead, was supplemented by an estimate of the cost of the extensions, prepared by Mr. F. E. P. Edwards, the City Architect. The estimate of the cost, as prepared by Mr. Edwards, makes an allowance of 23,078. for buildings, 24,102. of which is for the main block, the remainder being for the spinning and weaving sheds. Machinery and fittings are expected to absorb 10,000., the land required for the textile school (5,092 super. yds., at about 12s. 6d.), 3,122. 10s., and the land for a future extension or resale (7,169 super. yds., at about 8s. 3d.), 2,943. A sum of 7917. 10s. is allowed for contingencies.

PUBLIC LIBRARY, PAISLEY.—A new wing of the Free Public Library and Museum, Paisley, has just been opened. The addition has been built to the east of the main building, and is in the same style. From the vestibule on the right is the indicator-room, from which there is an entrance to the new reading-room. The rooms are lighted from the roof. In the upper chambers of the building there is a reading-room for ladies and also a boys' reading-room. The building throughout is heated with a system of radiators and fitted with the electric light. Messrs. Honeyman, Keppie, & McIntosh, Glasgow, were the architects.

PUBLIC HALL, CROFT, LEICESTERSHIRE.—On the 30th ult. the Hon. Philip Stanhope, M.P., opened a new public hall and club at Croft. The building consists of a hall measuring 33 ft. by 22 ft., exclusive of the recesses, which consist of a platform, 16 ft. by 8 ft., an

ingle nook fitted with seats on each side of the open fire, and a gallery over. Retiring-rooms are provided on each side of the platform, communicating with it and with the hall, and in the foundation space is a billiard-room. The base of the building has been constructed of local granite. The superstructure is built of local made bricks, partly finished with selected red bricks, but in the main coated with rough-cast composed of cement and granite clippings. The verandah is supported on oak posts and timbers, and the roofs are covered with hand-made red tiles from Staffordshire. The building was erected by the staff of the Croft Granite, Brick, and Concrete Co., under the direction of Mr. C. H. Robottom, the manager, from the design of Messrs. Barry Parker & Raymond Unwin, architects.

MISSION ROOM, TWICKENHAM.—The new mission room, in Milford-road, St. Margaret's, was recently dedicated by the Bishop of Kensington. The building, designed by Mr. J. S. Alder, London, provides accommodation for 350 persons. The scheme, when completed, provides for a number of club and class rooms, with a gymnasium, but for the present only the hall, with two small rooms, and lavatory, and storeroom for seats have been built. The total cost has been a little over 2,000.

INEBRIATES' HOME, HAIRMYES, LANARKSHIRE.—An inebriates' home, erected by the Lanark County Council, at Hairmyres, was opened on the 1st inst. The building has been constructed from the design of Mr. Paterson, architect, Hamilton, and provides accommodation for ten patients. The home is built on the cottage system, and in addition to the quarters for the patients there is a section for the administrative part of the institution. Accommodation is provided for the nurses in the home, which contains fourteen bedrooms, this arrangement allowing a separate bedroom for each patient.

PRESBYTERIAN HALL AT FOREST HALL, NORTHUMBRIA.—The foundation-stones of a Presbyterian hall has just been laid at Forest Hall. Mr. Walton Taylor, of Newcastle, is the architect. The new hall (including platform) is 52 ft. by 28 ft. 5 in., and the principal entrance is from the main road. On each side of the entrance corridor there are cloak-rooms provided for each sex, and a ladies' room on the first floor occupies the whole frontage. At the opposite end of the hall is a raised platform, so arranged that it can be divided into two classrooms by means of movable partitions. In addition there is an infants' room and a kitchen. The new minister's vestry, which has a separate entrance giving access to new hall and church, is a continuation of the new buildings, and faces the main road. The new premises are to be built of stone. The contract has been let to Mr. John Craven, builder, of Newcastle.

ISLINGTON HOSPITAL, WALTON.—The new fever hospital, which has been erected at Walton, was opened a short time ago. The buildings consist of an administrative block, which contains living accommodation for the nurses to be employed at the hospital. The block called Ward Block A contains two wards of four beds each. They are heated by a central stove, and each has a lavatory and sink accommodation at the end. The wards will accommodate four males and four females respectively, and this block is intended for scarlet fever patients. Ward Block B contains two wards, each with two beds, and fitted with kitchen and other accommodation. This block will be used for typhoid and diphtheria patients. The outbuildings comprise a mortuary, ambulance shed, laundry, and ironing and furnishing room for linen. The buildings are of brick, with overhanging roofs of brinded Ruabon tiles. Half-timbered work is introduced in the design, and the site is bounded with a rustic fence of oak. The floors of the wards are of maple, sanded, and wax polished. The whole scheme has been designed and carried out by Mr. F. E. Dixon, Engineer to the Walton-to-Dale Urban Council. The contractor for the work was Mr. M. Shorrocks, and the sub-contractors were Mr. Richard Bashall, Messrs. Tullis, Mr. Robert Hull, Mr. Breakell, Messrs. W. Cook & Sons, and Messrs. Sanderson & Southworth.

BAKERY, NORWICH.—A new steam bakery has been erected in West End-street, Heigham, by Mr. F. H. Bassingthwaite. The premises consist of a red brick building, 5 1/2 ft. in length, and two stories high. The upper floor will be used as a flour store, and the lower floor is divided into three portions—the bakery, the breadroom, and the loading-room. The bakery is 36 ft. by 23 ft. The walls are faced with white enamelled bricks, and the floors throughout the building are laid in mosaic. The whole will be lighted by electricity. Messrs. Morgan & Buckingham.

were the architects; Mr. W. J. Hammett, the builder; and Messrs. A. Pank & Sons, plumbers.

BREWERY, DUBLIN.—A new brewery has been erected in Dublin for Messrs. Guinness & Son. The building occupies a rectangular plot of ground of 2,330 sq. yds., with a frontage of 150 ft. to Robert-street, and Grand Canal-place respectively, the pile rising to a height of 130 ft. above the street level, and containing nine floors, ranging from 10 ft. to 19 ft. The structure has been built on cement concrete foundations, varying in depth from 14 ft. to 17 ft., upon which have been erected stanchions of rolled steel. These in turn support rolled-steel girders, fixed horizontally, the whole forming the framework for the floors and walls. The walls are of bricks of an average thickness of 2½ ft., and the dressings are of white enamelled bricks. The floors are of concrete. The outer faces of the walls are broken at intervals with a base 12½ ft. high, and strings and cornices of chiselled and moulded granite from the Ballyknock Quarries. The roof is composed of wrought-steel principals, supporting timber purlins and boarding, Mellows' patent glazing, and slates capped with sheet lead. The building contractors were Messrs. McLaughlin & Harvey, Ltd., Dublin, and their manager, Mr. Anthony Campbell, organised and superintended the work. The steel-construction work was carried out by Sir W. Arrol, Messrs. Ross & Walspole were the contractors for the steel roof work; Mr. Wm. Osborne supplied the granite work; and Messrs. Oates & Green were the manufacturers of the white enamelled bricks. The design of the building and the supervision of its erection were under the control of the engineer-in-chief, Mr. A. H. Hignett, and his staff. Mr. Arthur Dudgeon, Dublin, was the surveyor and measurer of the works.

PROPOSED EXTENSION OF CO-OPERATIVE COMPANY'S PREMISES, ABERDEEN.—A deputation from the directors of the Northern Co-operative Company, Aberdeen, accompanied by Mr. Geo. Watt, architect, attended a recent meeting of the Plans Committee of the Aberdeen Town Council for the purpose of laying before the meeting plans of a reconstruction of the premises of the company in Loch-street. It is practically proposed to rebuild the entire elevation facing Loch-street and to make it a height of four stories instead of three as at present. The probable cost of the rebuilding will be about 5,000.

COTTAGE HOMES, DOWNDEN, GLOUCESTER.—The new Cottage Homes at Downden, which were opened on the 24th ult. by the President of the Local Government Board, have been provided by the Bristol Board of Guardians at a cost of about 20,000. The site comprises 20 acres, 12 acres of which are fenced off and retained for agricultural and market garden purposes. The group of buildings comprises a lodge entrance, seven blocks of fourteen semi-detached houses, a convalescent home, and a small hall for general, including school purposes. Each of the houses contains a hall, a dayroom, 17 ft. by 15 ft., a kitchen of like dimensions, scullery, larder, usual domestic offices, and officers' sitting-room. On the upper floor are two bedrooms for children, measuring 17 ft. by 15 ft., with observation window to officers' room, an isolation-room, 12 ft. by 10 ft., bathroom, lavatory, and officers' bedroom. The convalescent home contains on the ground floor two dayrooms, 25 ft. by 17 ft., one of these being for boys and the other for girls; a dining-room of the same size, cloakroom, kitchen, larder, scullery, and an officers' sitting-room. On the first floor there are on the boys' side three bedrooms, 17 ft. by 15 ft., bathroom, lavatory, etc. The accommodation on the female side is similar, and the two departments are separated by a house-parent's bedroom. There are three bedrooms on the upper floor, together with store rooms and other conveniences. The hall is 50 ft. by 30 ft., and in front of the building is a large piece of grass ground available for games. The homes will provide accommodation for 168 children. The buildings have been erected by Messrs. Geo. Downs & Sons, from the designs of Messrs. La Trobe & Weston.

ALMSHOUSES, BRADFORD.—A commencement has been made with the preliminary work in connexion with the new almshouses, which are to be erected at Daisy Hill. The site lies on either side of Daisy Hill-lane, the principal portion—some 18 acres—being between the top of Hazelhurst-road and the Daisy Hill reservoir. Close by is a smaller plot—about 8 acres. The larger plot is to be the site of the new test workhouse. Its construction is not, however, to be immediately undertaken. On the smaller plot the Guardians are about to erect sixty-six cottages for the accommodation of the aged and deserving poor. The

cottages will be built in blocks so arranged that each looks out on an expanse of grass plot set with trees. With each block will be a recreation-room or sewing-room, and a common kitchen. An administrative block, with accommodation for a caretaker and his wife will be provided as an adjunct of the kitchen. Each cottage will be a single-roomed dwelling devised to hold two persons. They will be built of brick, covered with rough-cast, with stone dressings, and roofed with Yorkshire stone slates. There will be a bath-house for each block. The plans and designs for this scheme, which have been prepared by Messrs. Empsall & Clarkson, architects, of Bradford, have just been approved by the Local Government Board, and the first part, consisting of twenty-eight cottages, will be put in hand without delay.

ENLARGEMENT OF THE CATTLE MARKET, YORK.—On the 22nd ult. the extensions, which have been made to the York Cattle Market, were opened by the Lord Mayor. A large area has been added to the covered market, and two new auction rings and offices have been added, with a façade to Paragon-street. These include additional settling-rooms and offices for the auctioneers conducting the sales, lavatories, and other accommodation. Between the two rings is a glazed verandah for the accommodation of those attending the sales. The auction rings are fitted with domed roofs. In the well is an iron pen in which the animals will be shown, and round this is a passage-way, from which rise tiers of seats with an auctioneer's rostrum facing the cattle entrance. The two rings are connected by an alley-way to enable buyers and dealers to obtain easy access from one ring to another. The total area of the market now affords accommodation for 7,680 cattle, 9,465 sheep, and 500 pigs. The improvements have been carried out from the plans of Mr. E. Creer, the City Engineer.

SANITARY AND ENGINEERING NEWS.

WHARF, PORTISHEAD, BRISTOL.—The new timber wharf at Portishead was recently opened. The structure is 600 ft. long, and the bottom of the dock has been dredged to allow a vessel drawing 22 ft. of water to be berthed alongside. For the construction of the wharf, timber piles, upwards of 50 ft. in length, were driven into the ground, and they were then braced and fastened together. To fix the bracing it was necessary to construct a watertight dam enclosing the whole wharf. The ground at the back of the wharf has been levelled up so as to form a stacking area. It has been provided with a system of railway sidings connected with the Great Western Railway Company's line, and terminating in a gridiron, 450 ft. long, consisting of eight sets of railway lines. To effect the junction with the Great Western Railway it was necessary to build a small bridge over the Portbury Stream Diversion. The steel girders and flooring of this bridge rest on foundations carried on timber piles. Two open sheds covering an area of 1,800 sq. yds. have been erected close to the railway sidings with a covered way between them. To facilitate the handling of timber three steam cranes with specially-designed curved jibs to reach over high stacks of timber have been provided. On the wharf there are two steam travelling cranes with elevated bases and long jibs. A jetty, 200 ft. long, with berths on both sides, has been provided for the accommodation of barges, and a crane lifting 6 tons, has been erected at the end to deal with log timber. The stacking ground is furnished with a system of fire hydrants connected to the water company's main, and hose-boxes with standpipes and nozzles are fitted at convenient places. The contractors for the main work were Messrs. Joseph T. Firbank, Ltd., of London. The cranes were supplied by Messrs. Stothert & Pitt, Ltd., of Bath, and the open sheds were erected by Messrs. J. Lysaght, Ltd., of Bristol. Mr. W. W. Squire is the docks engineer, and the cost of the undertaking has amounted to 30,000.

WATERWORKS, SKIPTON.—A commencement has been made with the laying of the pipe track which is the initial step in Skipton's new scheme of water supply sanctioned by the Skipton Water and Improvement Act of this year. A 12-in. main, which is to be permanent, is now being laid to the site of the intended reservoir at the foot of Embsay Moor. It will then be taken outside the top water line of the intended reservoir to the stream known as Moor Beck, where a weir will be made. This weir, which will be about 730 ft. above sea level, will be so constructed that it will pass the compensation water required by Act of Parliament, the surplus

water being taken through the main to the town. To ensure the best water being supplied, the Whitfield Springs, which in themselves yield 150,000 gallons per day, will be conducted to the weir. The Embsay Moor reservoir, which is two miles one furlong from the centre of Skipton, will have one embankment right across the valley in a line indicated by the trial shafts that have been sunk. The capacity of the reservoir will be 120,000,000 gallons, and the surface level of the water in the reservoir is full will be 700 ft. above sea level. The drainage area is 700 acres. The total estimated cost of the new scheme is about 70,000, and Messrs. G. H. Hill & Son, Manchester, are the engineers, assisted by Mr. J. Mallinson, Engineer and Surveyor to the Skipton Urban Council, who has charge of the preliminary work of laying the permanent pipe track that is expected to be available for water supply augmentation purposes by next spring.

PROPOSED ESPLANADE, KIRKCALDY.—Messrs. Sang & Lockhart, C.E., Kirkcaldy, have submitted a report to the Kirkcaldy Town Council on the proposal to form an esplanade from the harbour to Rose-street, a distance of 1,995 ft. They detailed several schemes, in each of which a concrete wall the whole length of the esplanade would be necessary. The top of the wall would be on the same level as the proposed new pier, with a parapet 3 ft. high. Inside the wall would be a heavy concrete footway 50 ft. wide, sloping towards the wall, and at the inside of the footway one or two steps leading down to a macadamised roadway 60 ft. wide, and on the inner side of this roadway, along the new building line, a concrete footway from 10 ft. to 15 ft. wide would be formed. Opposite the Port Brae a cart road 12 ft. wide would lead down to the beach, with two stairways along the wall at distances of 170 yds. The plans showed a complete scheme at an estimated cost, including engineering and inspection, of 16,800,000. Another scheme, costing about 14,000, would be to form a concrete footpath 20 ft. wide along the wall, and, at a suitable distance from the new building line, to form a roadway 28 ft. wide, and the space between the roadway and footway could be levelled up with ashes to form a promenade.

SEWAGE DISPOSAL SCHEME, CARLISLE.—Mr. Sandford Fawcett, M.L.S.C.E., on behalf of the Local Government Board, held an inquiry at Carlisle, on the 5th ult., respecting the application of the Carlisle Corporation for power to borrow 55,000, for a sewage disposal scheme for the city. Mr. H. C. Marks, the Carlisle Surveyor, who is engineer for the sewage disposal scheme, produced plans and explained the scheme in detail. They had had, he said, an experimental bacteriological scheme dealing with part of the city sewage for several years, and so satisfactory was its operation that the City Council decided upon the extension of the scheme before the inspector, Mr. George Chatterton, engineer, of Westminster, also gave evidence in support. Professor Diddon, analytical chemist, described the effluent after it had gone through the bacteriological process at present in use as almost as clear as ordinary river water. There could be no fear of pollution. Mr. Joseph Graham, engineer, Carlisle, said he agreed with the continuous system being adopted for Carlisle, but thought the land for the works ought to have been on the Eberby side of the river.

PIER IN THE ISLAND OF MULL.—A new pier is being erected at Saen, Mull, from the design of Mr. James Deas, C.E., Glasgow. It consists of a sub-structure of concrete carrying a pierhead of open timber work, approached by a wooden gangway, the whole estimated to cost slightly over 5,000. The contractors are Messrs. George Halliday, Ltd., Rothsay.

MISCELLANEOUS.

BROOKS'S PARABOLA CURVE.—This instrument, which the rules of grammar suggest should be described as a "parabolic" curve, is a piece of transparent celluloid sheet cut in the form of a parabolic segment, and intended to be used in the same manner as a set-square. Its convenience is increased by the inscription of a line representing the axis, and of a second line serving to locate the focus of the parabola. In drawing diagrams the instrument can be employed for delineating curves to represent all parabolas, if suitable vertical scales be adopted—a course that will often save much time, as it is far more easy to construct an additional scale than a new parabola. In connexion with the study of mathematics, the curve should be appreciated by teachers and students alike, for by its aid a true parabolic curve can be

drawn in a few moments. It is only necessary to rule a straight line for the axis, and upon this mark a point to represent the focus. The elliptic curve is then placed in position with its inscribed axis and focus upon those previously marked on the paper, when the curve can be instantly drawn. By marking the distance of the focus on the other side of the vertex of the parabola, the directrix can be ruled with equal facility by the aid of the straight-edge at the base of the instrument. An additional advantage is that the curve is proportioned for use on squared paper, the unit adopted being in. The employment of such an appliance has been suggested by writers on mathematical subjects, but we believe the patentee of this curve deserves the credit of being the first to produce an instrument of the kind in a commercial form.

WIRE-WOUND WOODEN PIPE.—According to a report furnished by the United States Consul at Vancouver, a Canadian company has installed a plant there for the manufacture of wire-wound wooden pipes, for which several orders have already been executed, and others are on hand. It is claimed that this pipe is superior, for water-supply purposes, to iron pipe, and can be furnished at less than half the price. Besides this, it is much lighter to handle, and is not so liable to burst upon freezing as pipe made of iron. Large quantities of this pipe are being put into use by mill owners and mining engineers, as its use results in the saving of water and repair.

AGATE QUARRIES.—The onyx quarries at Ain Snava are very extensive, covering fully 7,500 acres, and the beds vary in width from 6 ft. to 55 ft. The following are the principal qualities of onyx found there and the width of the beds:—

Quality.	Width of Bed.
	ft. in.
Golden, with a seam	33 0
Cloudy	13 0
African	13 0
Red African	13 0
Red agate	10 0
Denticulated	1 8
Jasper agate	7 0
Oxidated red	3 0
Rose agate	3 0

From the first two seams columns can be produced with the exceptional length of from 12 ft. to 15 ft. The monolithic columns for the Roman Catholic cathedral at Westminster were obtained from these quarries, which are in the hands of a house at Marseilles, by whom the stone is sent to France to be dressed. The district of Bône is renowned for alabaster of the same density as that of Valterra, in Tuscany. The stone, of great transparency, takes a fine polish and is fully equal to the finest alabaster of Italy and Scotland. An important marble and onyx quarry, situated at Ouled-Rahmoun, is now being worked by a French company. The stones obtained include golden onyx, spotted onyx, clouded onyx, red onyx, African red onyx, pink agate, and other varieties. Most of the marbles are similar to those in the ancient monuments of Rome and Carthage.

WHITE SEA TIMBER EXPORTS.—Sir Capel Wolsey, British Vice-Consul at Archangel, in his annual report recently received at the Foreign Office, states that the export of timber from all the White Sea ports amounted in 1903 to 1,097,914 ft., or about 267,000 tons, less than in 1902. He explains that this year (1904) is the fourth in succession of depression in the timber trade. Among the circumstances which have contributed to this long-continued setback may be mentioned the refusal of the Crown Lands Department either to abate the high rates to which they raised the price of standing trees after the prosperous years 1899 and 1900, or to offer for sale sufficient timber to keep the mills in constant work, even if the owners were prepared to pay the high prices asked. Again, some merchants, in view of the increase of trade which followed the conclusion of peace between France and Germany in 1871, purchased at high prices in anticipation of a large demand from South Africa, and consequent improvement in the general market. The non-realisation of these anticipations may be considered as contributing to the depression of the timber trade. In 1903 the general depression was but little affected by the rise in the price of red wood. Profits on this class of timber were more than counterbalanced by the losses on white wood, the price of which had fallen considerably owing to the increased import to the United Kingdom of Galatz white wood. At the same time the London merchants combined to force down the price of all Archangel timber. This combine was resisted by the Archangel shippers, who, at the close of the season, sold some wood to London buyers at their own prices. At the autumn

sales, the Government demanding as before a heavy price for logs, many of the Archangel merchants, anticipating a continuation of low prices in foreign markets, refused to buy, with the result that about 500,000 white wood logs remained unsold. In consequence of this diminution of supply many mills, having sawn all their available logs, laid idle for some three or six months. The 500,000 unsold logs are this year included in the Government offers for sale at the same price as before. The saw-mill owner's present position appears to be a critical one. If he refuses to buy, his mill must be closed as soon as the supply of logs in hand has been sawn; his capital will thus lie idle, and in two years—i.e., in 1906—he will have no sawn wood goods to export. If, on the other hand, he buys logs at the Government price, and the market for sawn timber does not materially improve, he must inevitably suffer heavy loss. It is supposed that, were the merchants to combine in refusing to purchase, the Government would lower its prices; but such action, to be effective, requires a unanimity impracticable in the present case, when any merchant holding aloof from the combine would become possessed of an exclusive supply of timber, with the prospect of sale at a considerably enhanced price. A small saw-mill at Archangel, managed by an Englishman, commenced sawing last year, and exported one cargo. A mill erected in 1901-2 at Korda, in which British shareholders were principally interested, was closed in 1903. A new mill at Peshora, owned by a syndicate comprising five Archangel houses and one London firm, commenced sawing last autumn, and export this year. The export of logs increased from 94,000 to nearly 116,000; that of sleepers from 25,000 to 107,000. Notwithstanding repeated representations by the local authorities the Russian Government has not yet imposed a prohibitive tax on the export of round timber. One cargo of poles, 13,000 pieces, was sent to the United Kingdom. About 65 per cent. of the timber shipments were destined for the United Kingdom.

A NEW WINDOW SASH.—Mr. Tate, of 47, Emond-road, Kilburn, has submitted to us a model exhibiting the latest of the many contrivances for working a sash window without weights. The sashes are raised by cords passing over pulleys at the top and brought down the side to winding drums in a box below the sill. By means of a winch the sashes are raised by turning the drum. A coiled spring is connected with the gearing to prevent the sash in any case coming down with a run. The sash is held up wherever desired by spring bolts passing through the frame at the side, and released on pulling a cord. Springs are always a weak point in fastenings of this kind; they are apt to lose their grip in course of time; though the compressing spring at the bottom, already mentioned, would probably always retain sufficient resistance to prevent an accident. The thing is, we are afraid, a little too complicated for general adoption, but it is ingenious and worth attention.

COMBINED DRAINAGE.—The Battersea Borough Council recently wrote to the President of the Local Government Board asking him to receive a deputation from metropolitan municipal bodies on the subject of combined drainage. In reply a letter has just been received stating that the President is of opinion that it is unnecessary to trouble a deputation to wait upon him, and suggesting that all the borough councils favouring immediate legislation in the matter should pass resolutions and forward same to the Board.—Kensington Public Health Committee have reported having passed the following resolution:—"That a communication be addressed to the President of the Local Government Board pointing out that, owing to the present unsatisfactory state of the law with regard to combined drainage, the borough councils throughout the metropolis are now frequently called upon to carry out, at the public expense, works of reparation and reconstruction tending solely to improve the private property of the individual owner, at a great and constantly-increasing cost to the ratepayers, and urging him to do all in his power to remedy, by early legislation, the injustice at present suffered."—The Works Committee of Paddington Borough Council reported on Monday having passed the following resolutions:—(1) That the Battersea Borough Council be informed that, in the event of their convening a conference of the metropolitan borough councils for the purpose of considering the question of combined drainage, and of formulating a proposition for the amendments required in the existing law relating thereto, with a view to making a joint representation on the subject to Parliament, this authority will send representatives; (2)

that the London County Council be informed of this action; also that this authority is prepared to support a joint representation to the Government with a view to the question of combined drainage being dealt with as a public measure.

WHITECHAPEL ART GALLERY.—A report of the inquiry in respect of this charity which was held by the Charity Commissioners has just been issued. The endowment consists of the site and buildings, which cost nearly 15,000l. There are no invested funds, but an annual grant of 500l. for maintenance is made by the central governing body of the City Parochial Foundation. Eleven exhibitions have been held since the establishment of the institution under the Charity Commissioners' scheme of February, 1899. The trustees' accounts for last year show receipts of 655l. and expenditure 599l., a balance of 66l. being carried forward.

DRAINAGE PLANS.—On Saturday the Public Health Committee of the Kensington Borough Council reported having had under consideration a letter from the London County Council forwarding a copy of a communication received from the Royal Institute of British Architects expressing the view that compliance with the by-laws of the County Council respecting the deposit of plans of drainage work involved great and unnecessary expense, and suggesting that the said by-laws should be modified so that they should only require the submission of a block plan and a written description of the pipes and apparatus. In compliance with a request from the authorities at Spring-gardens upon the foregoing, the Committee had passed a resolution to the effect that, while they concurred in the views put forward by the Royal Institute of British Architects as regards the desirability of some modification being made in the by-laws in the direction indicated in their communication, the Committee was of opinion that experience has shown that with regard to blocks of flats, and other large and complicated buildings of like nature, sectional drawings in addition to block plans and detailed descriptions are really indispensable.—On Monday the Works Committee of Stepney Borough Council reported that the Borough Engineer had sent them the following communication on the subject of the letter from the Royal Institute of British Architects:—

The result of my experience is that it is impossible to arrive at a correct conclusion from a block plan whether the construction of a drainage system is likely to be, when carried out in accordance with the statutory provisions relating thereto. There are other matters beyond that of drainage which have to be considered, such as the sufficiency and position of water-closets, lavatory accommodation, open spaces, etc. Numerous instances have occurred in this borough where building owners and even professional architects have submitted plans which have not complied, at the first application, with the regulations, and many cases the positions of the water-closets, etc., have been shown in most unsuitable positions; in fact, had block plans only been submitted, it is more than probable that the buildings would have been completed before the defects referred to were discovered. I therefore submit that in these cases the owners of properties have been saved a considerable amount of trouble and expense by the fact that proper plans were sent in in the first instance. Then, again, as to the great cost and trouble involved in complying with the requirements in connexion with any but the smallest buildings; as a matter of fact, it is found in actual practice that the architect or builder frequently sends in *two* copies of the building plans, so that the question of "trouble" does not arise, and the extra expense involved is very small even in large buildings. With regard to the statement that "the expense becomes infinitely greater in connexion with existing buildings, as it becomes necessary to measure up the whole of the old buildings and preparation of complete set of drawings," so far as this borough is concerned the statement does not apply. Although a large number of public and private buildings have been dealt with, in no case has a builder or owner been requested to furnish more than a block plan and attention or addition, and then only have plans been asked for dealing with the portion of the building where the structural alteration has taken place. The Committee stated that they had decided that a copy of the above be forwarded to the London County Council with an expression of opinion that, for the reasons given by the engineer, they disagreed with the proposal that the by-laws should be modified as suggested by the Royal Institute of British Architects.—The Public Health Committee of Chelsea Borough Council reported on Monday that they had adopted a communication sent in by the Borough Surveyor and the Medical Officer of Health, in which these gentlemen suggested that the by-laws referred to by the Royal Institute of British Architects should be modified in the following manner:—

(a) A detailed plan of the lowest floor of the house, showing the position of the proposed under-

ground drains and manholes, and of the existing drains, the position of water-closet, sinks, gullies, soil and vent pipes, rain water and other waste pipes. (b) A section in block of premises to be drained showing the gradient of underground drains, and positions of soil and ventilating pipe. Note.—These plans to be on a scale not less than 16 ft. to one inch, and all plans to be in duplicate. (c) A key plan showing the position of the premises proposed to be drained in conjunction with neighbouring premises. Scale 4 ft. to one inch.

The foregoing suggestions are to be forwarded to the London County Council.—The Highways and Sewers Committee of the Wandsworth Borough Council, in a report circulated on Monday, state that they have decided that the London County Council be informed that the Wandsworth local authority finds the by-laws useful in obtaining plans of drainage works, but that the block plan required by the by-law is all that is insisted upon in Wandsworth, and that the written description mentioned in the letter of the Royal Institute of British Architects is not considered necessary.

THE MYSTERY PLAY, LINCOLN'S INN.—The Christmas mystery play held on Wednesday at the Lincoln's Inn Hall must be reckoned a great success. It is to be hoped that the experiment will encourage the production of such plays in this country. They have a very definite value in the religious and artistic sense, and though their establishment here, as at Oberammergau, may be impossible and undesirable, original work like that of "Eager Heart," the title of Wednesday's play, will always be acceptable, and command large audiences. We do not know the names of the actors, or of those responsible for the staging, but we believe it was entirely an amateur performance. The play is written by Miss A. M. Buckton, and is published in book form. The story is based upon a legend telling how Christ, as an infant in the arms of Mary his mother, accompanied by Joseph, travels through the land every Christmas Eve seeking the home prepared for their reception. "Eager Fame" and "Eager Sense" make ready to receive the divine visitor with every show of pomp and circumstance. Their humble sister, "Eager Heart," stays at home in her poorly-furnished room. The travellers arrive as beggars, soliciting food and shelter, unrecognized by all; they find shelter in the room of Eager Heart. Here they eventually discover themselves to be the three Kings, the shepherds, and Eager Heart. The music is taken from Bach's Christmas Oratorio. The dresses were of the Florentine period; they and the staging were agreeable and effective. Once or twice the colour grouping was very fine. The acting, too, was restrained and in excellent taste throughout.

PROPOSED NEW RESERVOIR, BARNSELY.—An inquiry was held on the 30th ult. at the Town Hall, Barnsley, by Mr. F. H. Tulloch, Local Government Board Inspector, into the application of the Town Council for permission to borrow a further sum of 60,011*l.* for the completion of the Midhope reservoir. In addition to the Inspector, there were present at the inquiry Mr. H. Horsfield (Town Clerk), Mr. C. E. Hawksley (Consulting Engineer), and Mr. J. H. Taylor (Borough Surveyor and Waterworks Manager).—The Town Clerk explained that in 1896 the Corporation obtained an Act to construct the reservoir, which was estimated by Mr. Hawksley to cost 170,000*l.*, and the work was now nearing completion, and on June 7 last the actual cost had been 296,668*l.*, on which date it was estimated by Mr. Hawksley that 19,339*l.* would still be required. The works were perfectly satisfactory excepting the filter beds.—In the course of his evidence Mr. Hawksley explained that the amount now sought for was made up of 14,574*l.* 2*s.* 5*d.*, the estimate outstanding, which included 10,000*l.* for filter beds, 1,000*l.* for the reservoir service reservoir, and 1,000*l.* for the reservoir keeper's house. Engineer's commission to June 9 amounted to 6,040*l.*; estimated commission on the work yet to be done, 725*l.*—a total, less 2,000*l.*, the estimated value of the plant, of 19,339*l.* 2*s.* 5*d.* The reservoir keeper's house included a committee-room, stable, and coach-house.—After some questions had been asked by the Inspector the inquiry closed.

A NEW LIFTING AND CONVEYING APPARATUS.—We have recently had an opportunity of examining a simple and ingenious form of apparatus which should be of considerable service to constructional engineers, bridge builders, and others, for lifting and conveying girders, rails, heavy pipes, baulks of timber, and other materials. The apparatus, which is made by Messrs. Selig Sonenthal & Co., of Queen Victoria-street, E.C., consists of one or more vertical rectangular frames, formed of four steel posts connected at top and bottom by horizontal rails so as to constitute a frame of great strength and rigidity.

Between the two ends of the frame is a horizontal roller, each end of which is fitted into a bearing in a horizontal cross-bar having screwed bores at the ends, through which pass two vertical screwed shafts. These shafts are made in pairs, screwed with right and left hand threads, and fit at the bottom into foot-steps attached to the pedestal of the frame, while at the top they pass through bearings secured to the top framing, each shaft being fitted with a worm wheel, and a worm between each pair of wheels is actuated by means of a handle at the end of the worm shaft. The horizontal roller is employed for raising and lowering loads, and it can be worked up and down quite easily, owing to the great purchase afforded by the worm gear, which also permits the load to be stopped at any point without the slightest risk of dropping. The roller itself can be rotated on its axis by means of a handle, thus giving a traversing movement, right or left hand as desired, for conveying the material in a longitudinal direction. To prevent the roller from rotating when supporting irregularly-shaped objects, a ratchet wheel and catch are provided. The frames are fitted with four handles to facilitate adjustment, and those intended for use on level floors can be fitted at the bottom with travelling wheels or runners. In using the apparatus, the girder or other piece of material to be moved is slightly raised, so that the horizontal roller can be brought beneath it. The roller is then raised by means of the worm gear and vertical shafts, and, as soon as it comes in contact with the load, the latter can be moved forward or backward by rotating the roller. In many cases only one of the lifting frames is required, but when the material has to be transported for more than a few feet it is necessary to use two of the frames, advancing first one and then the other until the distance has been covered. A still more convenient method is to use three frames, of which any two are always supporting the member to be transported, and the third is placed in advance to afford a fresh bearing. Then, after the load has been moved forward so as to rest upon the two front frames, the hindmost one is brought up to the front, and the same cycle of operations is repeated as often as may be necessary. By suitable placing and adjustment of the apparatus, material can be conveyed over all sorts of obstacles, such as ditches, mounds, and irregularities of the ground, or across gaps in masonry and other structural work. It can also be applied with great advantage in engineering shops and erecting yards as an auxiliary to machine tools, and for other purposes, and, in fact, wherever material has to be lifted or moved about. The frames are made in various sizes, with lifting capacities ranging from 1 ton to 3½ tons each, and special types are available for certain classes of work. The apparatus described is exceedingly simple, and can be used by ordinary labourers without previous instruction.

CROWN LANDS.—A Bill will be introduced in the course of the ensuing Session to make better provision for the management and regulation of the Royal Forests, and for giving the Commissioners of Woods and Forests increased powers for exercising control over the discharge of sewage, the placing of refuse, the erection of encampments and hoots, and the exclusion of gipsies, hawkers, rogues, and vagabonds. The Bill also provides for a transfer of any fore-shore under the Commissioners' management to that of the Board of Trade, and *vice versa*, and for authorising the Commissioners and the Board of Trade, and the Chancellor and Council of the Duchy of Lancaster, respectively, to compromise claims to fore-shore as between the Crown and the Duchy, and claims to management as between the Commissioners and the Board of Trade, and for the abolition of the obligation to devote allotments to the Crown in East Beres, Alice Holt, and Parkhurst woods, co. Southampton, to the growth of timber.

SCIENCE AND ART DEPARTMENT, BOARD OF EDUCATION.—The report for the year 1903 on the Victoria and Albert Museum, the Royal Colleges of Science and of Art, the Geological Survey and Museum, and the work of the Solar Physics Committee has just been issued. The number of visitors to the science library shows an increase of about 10 per cent. over the number for the previous year, but a slight decrease in the attendances of readers (exclusively of Royal College of Art students) in the National Art Library of the Victoria and Albert Museum, and a decrease in the number of visitors to the branch museum at Bethnal Green. During the session 1902-3 of the Royal College of Science the total number of students under instruction was 304, of whom 165 were Government students. The students in the

Royal College of Art were 167 in all, as compared with 185 in the last preceding session. There was a marked increase in the number of classes who visited the Western Galleries with their teachers for scientific instruction and research.

CAPITAL AND LABOUR.

BIRMINGHAM BUILDING TRADES' FEDERATION.—For some years past (writes a correspondent) there has been a federation in Birmingham called the "Birmingham Building Trades' Federation." Its operations affect all five districts of Birmingham within a radius of five miles from Stephenson-place. The federation consists of sixteen trades engaged in building operations, and it is managed by an executive elected annually at the general meeting. For some time past certain sections of the trades—namely, the plasterers and painters—have been agitating that, in case of any dispute arising between employers and men, the whole of the trades combined should withdraw their men from the job or jobs upon which they were engaged until such employer had agreed to their terms. Owing to the decision in the Taff Vale case the executive of the federation could not see their way to comply with such demand. On a specially large building in course of erection by a well-known employer in Birmingham painters, etc., had been employed and not paid the standard rate of wages. This case was brought before the federation in the month of December, when the federation, through the plasterers and organising secretary of the painters and representatives of the painters demanded the withdrawal of all the men on November 14. The executive could not see their way to adopt this course owing to the arrangements existing between the men and the Conciliation Board of Masters, and, in consequence, an adjourned meeting was held on Thursday last week at the Trades' Hall, Hurst-street, when the following resolution was passed after strong and determined opposition:—"That, seeing it is impossible to carry out the principle of the work the federation was formed for, and always aimed at, through all societies refusing to combine for that purpose at the present time, the federation be at once dissolved, according to rule 20." It was also decided that "the executive committee of the federation should, in conjunction with the trustees, treasurer, president, and secretary, take steps to see that the income over expenditure year by year be proportionally divided among the societies contributing to the federation during the years the federation has been in existence; and that the cost of winding-up the federation should be equally borne by all societies federated." The cash balance is upwards of 1,000*l.* The effect of the resolution passed is that each society will have to stand upon its own basis; that is, the labourers in any case will not have the support of the carpenters, plasterers, etc., and, of course, *vice versa* throughout all trades. What the ultimate result will be is doubtful. Whether it will mean a reduction in wages by the Masters' Association after attacking first one and then the other of the trades in question, or whether they will only attack those that have caused such divided opinion in the building trade, remains to be seen. Meanwhile the most thoughtful and calm members of the societies affected are anxiously awaiting the effects of the split.—*Birmingham Daily Post.*

Legal.

POINT UNDER THE METROPOLIS MANAGEMENT ACT, 1855.

In the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathews, on the 6th inst., the case of the Metropolitan Water Board v. the Mayor, etc., of Westminster, was heard, on the appeal of the Water Board (the successors of the New River Company) from a decision of a Divisional Court of King's Bench, consisting of the Lord Chief Justice and Justices Wills and Kennedy, affirming a decision of Mr. Brox, the Metropolitan Sidespender. (The case before the Divisional Court was reported in the *Builder* of May 21, 1904.) The matter came before the Court in the form of a special case, from which it appeared that the Company were summoned before the magistrate by the respondents for neglecting to pay a certain sum alleged to be due to the respondents for expenses incurred in filling, making good, and maintaining the pavements in streets in Westminster when the same had been broken up by the Company, in pursuance of its statutory powers to execute work in the City of Westminster. The sum which

the respondents claimed included a charge of 10 per cent. on the cost of the work to cover the respondents' estimate of the expense to which they had been put for superintending the work during its execution by a contractor. The Company's contention was that by virtue of section 114 of the Metropolitan Management Act, 1855, the respondents were not entitled to make any charge for supervision or superintendence, notwithstanding that it was given, and that the same formed part of the general administrative duties of the respondents. The respondents, on the other hand, contended that the employment of officers to superintend and supervise such work was a necessary expense incurred by the Corporation in carrying out the work of reinstatement. The learned magistrate came to the conclusion that the respondents were entitled to recover a sum for the expenses incurred in respect of the supervision or superintendence of the work, but he reserved the question of the amount to which the respondents were entitled in respect of such superintendence and supervision, and whether it should be calculated on a percentage or other basis pending the decision of the High Court as to whether the respondents were legally entitled to make any claim in respect thereof. The Divisional Court upheld the decision of the learned magistrate, and remitted the case to him in order that he might determine the question of amount. From this decision the Water Board now appealed.

During the course of the arguments Mr. Morton Smith, for the respondents, stated that the only claim put forward was for the cost of superintendence thrown upon the respondents, which would not have fallen upon them had the Water Board or their predecessors done the work themselves.

Mr. Coulthorpe Munroe did not agree with this statement. The claim put forward in the police court was to 10 per cent. on the actual expenditure for supervision.

The Master of the Rolls said the case must go back to have a direct finding of fact whether there had been, in this case, any substantial extra expense incurred by the respondents owing to their undertaking the work themselves. When this was ascertained the Court would be in a position to decide on the true construction of the Act of Parliament.

ACTION AGAINST A BUILDER.

The case of the General Accident Assurance Corporation, Ltd., v. Day came before Mr. Justice Buckley in the Chancery Division, on the 1st inst.—an action by the plaintiffs against defendant for an account of the wages paid by him during the time he was insured against his liability under the Workmen's Compensation Act, 1897, the Employers' Liability Act, 1839, or at Common Law in respect of accidents to his workmen.

The facts giving rise to the action were these:—The defendant, a builder, in September, 1901, signed a proposal to the plaintiff company for an insurance against his liability in regard to accidents to his workmen. The defendant therein stated that the total estimated amount of the wages paid by him and his sub-contractors yearly was 3,000*l.*, and he agreed to pay premium of 5*s.* 6*d.* per cent. on the total amount of wages and salaries paid, and to render to the plaintiffs at the end of each period of insurance a statement, in the form required by the Corporation, of all wages actually paid, and to pay premium on any wages paid in excess of the amount estimated in the proposal form. The policy, which was issued on September 21, 1901, recited that the defendant had paid a sum of 3*l.* 5*s.* on account of premium, and had delivered a proposal in writing which was to form part of the contract, and that the plaintiffs agreed to indemnify him against liability as before mentioned. The 4th clause of the policy provided that the first and all future renewal premiums that might be accepted were to be regulated by the amount of wages and salaries paid to employes, and sums paid to sub-contractors by the employer during each year. It further directed that the names of every employe and sub-contractor, with the sums paid, should be entered in a proper book, and that no claim should be covered by the policy unless this should be done. It was also provided that every sub-contractor should, as far as possible, be required to keep a similar wages book so as to ascertain the employes entitled to call upon the employer for compensation; but in the event of the wages paid by any sub-contractor not being so ascertained, then, for the purposes of the policy, they were to be taken to be a sum equal to 60 per cent. of the sum agreed to be paid to such contractor for such work. Another term of the policy was that the employer should at all times allow the Cor-

poration to inspect the wages book, and would, on request, supply to the Corporation a correct account of all sums paid during any year of insurance, and if the total amount so paid should differ from the amount on which premium had been paid, the difference in premium should be met by a further proportionate payment to the Corporation, or by a refund by the Corporation, as the case might be. The policy was in force until September, 1903, when the defendant allowed it to lapse, and insured in another office. The plaintiffs, after making applications to the defendant for accounts of wages actually paid without receiving any answer, commenced the present action for an account of such wages during the two years in which the defendant was insured. The defendant, by his defence, denied that he was now bound to account, and his counsel stated that the wages he had paid were really less than the estimated amount.

At the conclusion of the arguments of counsel his lordship held that the plaintiffs were entitled to the account and the costs of the action up to the present time, the further costs being reserved.

Mr. Astbury, K.C., and Mr. Edward Ford appeared for the plaintiffs, and Mr. Buckmaster, K.C., and Mr. Humphry for the defendant.

HODGSON v. WAUGH.

On the 5th inst., Mr. Montague Lush, K.C., mentioned this case to the Lord Chief Justice in the King's Bench Division. (A report of the case appeared in last week's issue of the *Builder*.)

The learned counsel said his lordship would remember that the action was brought by Mr. Hodgson, the proprietor of an estate in Hertfordshire, known as Hexton Manor, against the defendant, Mr. John Waugh, an architect and civil engineer, for damages for alleged negligence in connexion with certain extensive alterations and repairs at Hexton. His lordship would also probably remember that, at the close of the case, in which his lordship reserved judgment, he (counsel) said he wished to disclaim any intention of imputing to the defendant any charge of fraud or dishonesty on his part. His lordship at that time asked if such disclaimer was made on the authority of the plaintiff, and he (counsel) was unable to say that it was, seeing his client had at that time left the court. Since then he had had an opportunity of communicating with his client, and he was now authorised and entirely approved of the withdrawal of any charges that had been made against Mr. Waugh of fraud or dishonesty. Mr. Hodgson had understood that no suggestions were made, and personally he had not wished them to be made.

The Lord Chief Justice said that certain questions which had been put were only consistent with charges of improper conduct, but the withdrawal was satisfactory, and would relieve him of a difficult part of the case. He was glad that the withdrawal of the charges was made with Mr. Hodgson's authority, and he hoped that publicity would be given to it. His lordship said he hoped to be able to give judgment on Monday week.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

24,473 of 1903.—F. JACOB: *Device for Opening and Closing Windows of Greenhouses, and the like.*

A device for closing and opening casements and windows to any required degree, characterised by the fact that a chain passing round a pulley is provided upon one end with a handle, and is connected by its other end to the casement or window rod to be operated, this chain comprising hollow oscillating links arranged alternately, a pawl oscillating upon a block to which the pulley is fitted, and engaged normally in one of the hollow links of the chain permitting the latter to move for opening the window, but preventing all motion of the chain in the opposite direction, an oscillating lever, arranged upon the said block, releasing, when a force is exerted thereupon with the handle end of the chain, the said pawl, and thus permitting the movement of the chain for closing the casement, this movement being stopped at any required instant by ceasing the pressure upon the said lever, and several levers being adaptable to said block, to correspond with the operation of several casements arranged in nearly the same place.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

24,618 of 1903.—A. SILBGER: *Building and Decorating Materials.*

A building and decorative material formed by the combination of cement and asbestos, kieselguhr or vegetable fibre in the proportions of from 10 per cent. to 25 per cent. of asbestos, kieselguhr or vegetable fibre, and from 90 per cent. to 75 per cent. of cement, subjected to great pressure in the humid or plastic state.

26,168 of 1903.—P. KIRKUP, A. P. STOKER, F. BOWMAN, and W. ALDERSON: *Machines for Cutting Coal, Stone, and other Hard Substances.*

Machines for cutting coal, stone, or other hard substances, consisting of a frame supported on a skate or skates on the coal side, and rollers on the side remote from the coal "face," or by a skate or skates on both sides, and provided with a fender adapted to bear against the "goaf" props or cblocks, and also with a horizontal roller adapted to bear against the coal "face," said fender and roller being disposed in the same plane or nearly so as the horizontal outer of the machine.

27,919 of 1903.—J. HARRIS: *Machinery or Apparatus for Making Tiles.*

A tile-making machine, consisting of a main horizontal cylinder revolving in bearings in a frame, an upper parallel cylinder revolving in adjustable bearings in the same frame and pressed down by springs, an inclined frame provided with freely revolving rollers and having one end adjustable in the frame of the machine above the main cylinder and capable of slight movement horizontally and its other end adjustable vertically in the upper end of an independent vertical frame at a sufficient distance from the main frame, a flexible endless apron or band passing over the upper cylinder and thence down and back between the two cylinders and down round the outer side of the main cylinder, then forward and inclining downward from a sufficient distance, and over and round a roller turning in adjustable bearings, in the outer end of a more or less horizontal frame pivoted near its front end to the main frame of the machine, and provided with freely revolving rollers on its upper side, and back below this pivoted frame and under and round a roller upon the inner end of the pivoted frame, thence up in front of the machine and over a guiding roller carried by the main frame, and up to the top of the upper cylinder at the point where it started so as to form an endless apron, flanges upon the lower main cylinder between which the upper cylinder revolves, fine strong adjustable wires stretched at suitable distances apart between the flanges on the main cylinder, for the purpose of cutting into the required lengths a strip of clay delivered continuously forward from a pug-mill upon the rollers at the back end of the upper adjustable frame, and forced between the two main cylinders of the machine which is kept in movement by the weight and pressure of the strip of clay.

308 of 1904.—R. C. HUGHES: *Window Sash Fastener.*

A window sash fastener, comprising a socket or casing attachable to one part of a window and having a cylindrical bolt provided with a helical spring, one end of which is secured to the bolt while the other end is fixed in or to the casing, a catch on the said bolt, means for retaining the catch when the bolt is in the bolted and unbolted positions, and a hole or holes in the other part of the window adapted to receive the bolt.

444 of 1904.—C. MATHEWS: *Water Waste Preventers.*

A water waste preventer, consisting in the combination with the tank and the ordinary pull chain or lever of mechanism which, when operated by the said chain or levers, opens a supply tap or inlet valve and closes outlet pipe or its valve, and means whereby the water, when it reaches a certain height in the cistern, shuts or closes the supply tap or inlet valve and opens the outlet pipe or its valve to permit the contents of the tank to escape.

512 of 1904.—P. BLOWES: *Treads for Stairs, Passages, Paving, and other like Surfaces.*

Tiles for forming treads for stairs, passages, paving, and other like surfaces, manufactured of artificial stone with projecting parts or pebbles disposed so as to leave passages or channels between them leading into main channels formed in the fronts and sides of the finishing tiles.

613 of 1904.—H. C. CLEAVER: *Open Fire-places.*

A fireplace for burning anthracite and like refractory or non-caking fuel upon an open grate, consisting essentially of a forwardly inclined apertured fire grate, a hopper

adapted to continuously deliver fuel by gravity to the upper extremity of the grate, a fence or kerb situated at the lower extremity of the grate so as to limit the descent of the grate so as to limit the descent of the gaseous products of combustion from the space beneath the grate.

1,470 of 1904.—A. J. BOULT (Internationale Siegartwaben Gesellschaft): Apparatus for Cutting Artificial Stone, Beams, Girders, and other Structures.

An apparatus for cutting a composite cast plate of artificial stone into separate sections characterised by a single cutter movable in a vertical plane vertically or obliquely relatively to the section to be cut, which cutter is carried by slides, guided in a movable frame and provided with toothed pinions which engage with toothed racks arranged in the frame, movement being transmitted to the toothed pinions by means of worm wheels and worms.

20,210 of 1904.—R. H. McWILLIAMS: Mode of and Means for Copying the Grained Surfaces of Wood and Transferring same to other Wood, Paper, Fabric, Floor Covering, and the like.

A method for producing a printing surface, which consists of thoroughly cleaning the surface of a selected piece of wood, then covering the same with oil to render it non-adhesive, then applying to the prepared surface a sensitive composition with a backing of fabric material.

21,280 of 1904.—M. ROSEN: Construction of Theatres, Hospitals, and Similar Buildings. This invention relates to the construction of theatres, hospitals, barracks, schools, and like buildings. The object of the invention is to provide exits which, in case of fire, allow a great number of people to leave the rooms at the same time. This invention consists in the substitution of the stairs by flat gangways with suitable inclination.

21,619 of 1904.—E. ESCHWEGE: Folding Furniture.

This relates to folding furniture, and consists of a pair of rods, a sheet of fabric secured to the same, removable bars holding said rods apart, and supporting members removably secured to the frame so formed, whereby the fabric may be rolled up on the rods, the removable members having first been detached and placed therein.

27,378 of 1903.—C. ALLEN and G. A. HAWTHORN: Spouts, Waterways, and Cornices for Buildings.

A spout or waterway constructed of a series of contiguous sections, each section consisting of a brick or block of stone or other material suitably curved or channelled and otherwise fashioned so as at the same time to serve an additional purpose beyond that of a spout section.

19,493 of 1904.—B. A. STEVENS: Apparatus for Preventing the Spread of Fire in Theatres, and the like.

This relates to an auditorium, consisting of a flue, leading therefrom a second flue within the first-named flue, combustible material in said first-named flue, and means for igniting said combustible material at the commencement of a fire, means for closing the first-named flue, arranged to be removed to open said flue when ignition takes place.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing property sales with columns for date, location, and price. Includes entries for November 24, 25, 26, and December 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31.

Table listing property sales with columns for date, location, and price. Includes entries for November 28, December 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31.

Table listing property sales with columns for date, location, and price. Includes entries for December 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31.

TO CORRESPONDENTS

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors. We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for notices or samples sent to or left at this office, unless he has specially asked for them. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications. We are compelled to decline unpaid orders and giving addresses. Any communication to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

MEETINGS.

Table listing meetings with columns for date, location, and time. Includes entries for Friday, December 9, Saturday, December 10, Monday, December 12, Tuesday, December 13, Wednesday, December 14, Thursday, December 15.

FRIDAY, DECEMBER 16.

Institution of Mechanical Engineers.—(1) Paper to be read and discussed, entitled "Heat Treatment Experiments with Chromo-Vanadium Steel," by Capt. H. Riall Sankey and Mr. J. Kent-Smith; (2) Messrs. Seaton and Jude's Paper on "Impact Tests on the Wrought Steels of Commerce," which was read at the last meeting, will be further discussed jointly with the above Paper, 8 p.m.

Institution of Civil Engineers (Students' Meeting)—Mr. R. H. Lee Pennell on "Folkestone Harbour: Cylinder-Sinking at the Root of the Old Pier," 8 p.m.

PRICES CURRENT OF MATERIALS.

*Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing prices for various materials including BRICKS, GLAZED BRICKS, IVORY, GLAZED STRETCHERS, and THAMES AND PIT SAND. Includes columns for item name and price per unit.

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime in sacks, 2s. 0d. per yard, delivered. Stourbridge Fireclay in 12s. 6d. per ton at rly. dpt.

Table listing prices for various types of STONE, including Bath Stone, Portland Stone, and Ancaster in blocks.

Table listing prices for various types of YORK STONE, including Scappled random blocks and 6 in. sawn two sides.

Table listing prices for HARD YORK stone, including Hopton Wood (Hard Bed) in blocks and 6 in. sawn both sides.

Table listing prices for SLATES, including 20 x 10 best blue Bangor and 20 x 12.

Table listing prices for TILES, including Best plain red roofing tiles and Best Rosely tiles.

Table listing prices for WOOD, including Deals, Battens, and Foreign Sawn Boards.

Table listing prices for Fir timber, including best middling Danzig or Memel and Second yellow deals.

Table listing prices for JOINERS' WOOD, including White Sea first yellow deals and Second yellow deals.

Table listing prices for various types of PITCH-PINE, including Under 2 in. thick extra and Yellow Pine.

Table listing prices for WOOD (continued), including JOINERS' WOOD (continued) and Prepared Flooring.

Table listing prices for JOISTS, GIBBERS, &c., including Rolled Steel Joists and Compound Girders.

Table listing prices for METALS, including Common Bars and Staffordshire Crown Bars.

Table listing prices for SHEET IRON, including Ordinary sizes and Galvanized sheets.

LEAD, &c.

Table listing prices for LEAD, including Lead-Sheet, English, 3lb. and up.

Table listing prices for ENGLISH SHEET GLASS IN CBATES, including 15 oz. thirds and 21 oz. fourths.

Table listing prices for OILS, &c., including Raw Linseed Oil in pipes and Turpentine.

PRICES CURRENT.—Continued on page 619.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.			
Nature of Work.	By whom Required.	Premiun.	Designs to be Delivered
* Proposed Northumberland War Memorial	Committee	Not stated	No date.

CONTRACTS.			
Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Extension of Electric Light Installation, Workhouse	Pontefract Guardians	A. Hartley, J.P., County Chambers, Castleford	Dec. 10
Street Works, Openshaw	Manchester Paving, etc., Committee	Paving, etc., Department (Surveyor's Office), Town Hall, Manchester	Dec. 12
Street Works, Clayton	do.	do.	do.
Street Works, Bradford (N. Manchester)	do.	do.	do.
Street Works, Ardwick	do.	do.	do.
Street Works, Palmerston-street, Manchester	do.	do.	do.
Alterations, etc., Dunraven Hotel, Tonypanddy	Trustees of the late T. Davies	A. O. Evans, Williams, & Evans, Architects, Pontypridd	do.
Granite, etc.	Longton Corporation	J. W. Wardle, Borough Surveyor, Court House, Longton	do.
Painting, etc., Cowerton County School	Olamorgan County Council	T. M. Franklin, County Council Offices, Westgate-street, Cardiff	do.
Footpath, Cae-ran Council School, Maesteg	do.	do.	do.
Playgrounds & B'ndry-Wall, Seven Sisters Ccl. Sch.	do.	do.	do.
Stores, Paints, Oils, etc.	Cardiff Corporation	J. Wiggins, Town Hall, Cardiff	do.
Repairs, etc., of Cr-w-st. Infant's Council School	Brighton Education Committee	F. Simpson & Son, Surveyors, 17, Chapel-street, Brighton	do.
Laying-out, etc., Grooming Recreation Ground	Hford U.D.C.	H. Shaw, Surveyor Town Hall, Hford	do.
99 yds. of 15-in. Cast-Iron Flanged Pipes, Alnmouth	Alwrick R.D.C.	H. W. Watton, Clerk, Alwrick	do.
Wing for Female Patients at Melrose Asylum	Roxburgh District Board of Lunacy	S. Mitchell & Wilson, Architects, 13, Young-street, Edinburgh	do.
Stores	Birkenhead Tramways Committee	do.	Dec. 18
Cottage at Granilla Station, Mon.	Great Western Railway Co.	Engineer, Newport Station	do.
Cleaning, Colouring, etc., of Schools	Leyds Education Committee	W. Parker, Secretary, Education Offices, Leeds	do.
21 Sculleries and Water-Closets, Orenup's-terrace	do.	S. Wilkinson, Architect, Sowerby Bridge	do.
Fitz-up Baths in 8 Hses., Nichol's-ter., Sowerby B.	Dudley Guardians	G. W. Caster, Clerk, Union Offices, St. James'-road, Dudley	do.
Heating Infirmary Wards at Workhouse	do.	do.	do.
Hot-Water Supply to Baths and Lavatories at Workh.	Tunbridge Wells Corporation	W. H. Maxwell, Borough Engineer, Town Hall, Tunbridge Wells	do.
Painting, etc., at Town Hall, Calverley-road	Banbury Town Council	N. H. Dawson, Borough Surveyor, Town Hall, Banbury	do.
Stoneware Pipes, Lime, and Cement	Edmonton U.D.C.	O. Eedes Echus, Engineer, Town Hall, Lower Edmonton	do.
Tree-guard Laths	Dromore West R.D.C.	Board Room, Dromore West	do.
Granite Kerb	Watford R.D.C.	E. Lalley, Engineer, 9, Market-street, Watford	do.
Sewage Works, Easky, Ireland	Rev. H. Irvine	P. E. Cleverton, 4, Buckland-terrace, Plymouth	do.
Sewerage Works, Northwood	East India Railway Co.	O. B. Mitchell, Architect, 148, Union-street, Aberdeen	do.
Alterations to Market and Shop	Manchester Improvement Com.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	Dec. 14
Spiral and Volute Springs	Hemsworth R.D.C.	City Surveyor's Office, Town Hall, Manchester	do.
Tudmible Wrought-Iron Fencing, Middleton-road	do.	T. H. Richardson, Hensworth, near Wakefield	do.
Road-making at Hemsforth	Fulham Guardians	E. J. Mott, Clerk, Fulham Palace-road, Hammersmith, W.	do.
Unbroken Granite	Felixstowe and Walton U.D.C.	H. Clegg, Engineer, Town Hall, Felixstowe	do.
Alterations, etc., to Store Buildings, Garrison-lane	Bristol Watch Committee	T. H. Yabbicom, City Engineer, 63, Queen-square, Bristol	do.
Two Firemen's Dwellings, Bedminster Police Station	St. Germans R.D.C.	P. E. Cleverton, 4, Buckland-terrace, Plymouth	do.
Waterworks, Brookdown-terrace, Pily, St. Stephen's	School Board	Settle & Brundrit, Architects, Ulverston	do.
School, Play-sheds, etc., Strathbin, Scotland	Swarthmoor, etc., Co-op. Soc., Ltd.	O. Reavell, jun., Architect, Alwrick	do.
Five Houses in Clarence-street, Tiverton	Ancient Order of Foresters	Hall & Fenton, Architects, 14, St. James'-row, Sheffield	Dec. 15
Repairs, etc., St. Paul's Church, North Sunderland	Down District Asylum Committee	E. O. Mawbey, Boro' Engineer, Town Hall, Leicester	do.
Salchops, Offices, Assem. Hall, Trippet-la., Sheffield	Leicester Corporation	do.	do.
Five Sets of Fire Escape Stairs, Downpatrick Asylum	do.	do.	do.
Brushes, etc.	Hale U.D.C.	T. Blagburn, Surveyor, Ashley-road, Hale, Cheshire	do.
Materials (Seven Contracts)	Barnstaple U.D.C.	Offices of Borough Surveyor	do.
Granite	Batley Corporation	J. C. Barrowclough, Waterworks Engineer, Batley	do.
Making-up Delahays-road, Hale	Town Council	W. Reid, Architect, Saltoun-square, Fraserburgh, Scotland	do.
Painting	Glasgow Corporation	Batou's Works Office, 64, Cochranes-street, Glasgow	do.
Fire-station, Woodwell	Searleburgh Town Council	E. T. Beard, Engineer, 57, Sandside, Scarborough	Dec. 16
Hospital, Fraserburgh	Glasgow Corporation	J. Dalrymple, 102, Renfield-street, Glasgow	do.
Eleva. & Ods. Lift, Cen. Police Office, St. Andrew's-sq.	Graigola-Merthyr Co., Ltd.	Offices of the Company, Swansea	Dec. 17
Hill Lodges, Town, etc., on Marine Drive	Liversedge U.D.C.	C. Gott & Sons, Engineers, 3, Charles-street, Bradford	do.
2,900 tons Steel Order Balls	Rev. H. Irvine	F. B. Bates, Architect, 29, Westgate-chambers, Newport, Mon.	do.
Stores	Madras Railway Co.	W. H. Cole, Secretary, 61, New Broad-street, London, E.C.	Dec. 19
Six Miles of Sewers (Contract No. 10)	Bristol Sanitary, etc., Committee	T. H. Yabbicom, 63, Queen-square, Bristol	do.
School at Mountain Ash	Cardiff Corporation	A. Ellis, Borough Electrical Engineer, The Hayes, Cardiff	do.
Stone Hauling	Settle R.D.C.	Barber, Hopkinson, & Co., Engrs., Craven Bank-chbrs., Keighley	do.
Plant for Extension of Power Station	Chorley Corporation	J. Mills, Town Clerk, Town Hall, Chorley	do.
1,100 yds. of Sewers, etc.	Stevenage U.D.C.	Offices of Council, Orchard-road, Stevenage	do.
Disinfecting Liquid	Hford U.D.C.	H. Shaw, Surveyor, Town Hall, Hford	do.
Road Works Haverock-lane	Peterhead Town Council	T. H. Scott, Architect, Town Hall, Peterhead, Scotland	do.
Telephone Fire-Alarm System	Beckenham U.D.C.	John Angel, Surveyor to the Council, Beckenham	do.
Infections Diseases Hospital	do.	do.	do.
* Two Cottages for Firemen in Westbourne-road	Hindley U.D.C.	A. Holden, Engineer and Surveyor, Council Offices, Hindley	do.
* Bath & Mess Rm. at Dust Destructor Wks., Arthur-rd.	Fulham Borough Council	H. Bewick, County Architect, Newgate-street, Chester	Dec. 20
845 yds. Wrought-Iron Fencing, with Gates, etc.	Bombay, etc., Railway Co.	A. J. Fuller, Borough Electrical Engineer, Town Hall, Fulham	do.
Infants' School, St. Paul's School, Comptail	Dublin Cleansing Committee	T. W. Wood, Sec., Gloucester House, Bishopsgate-st. Without, E.C.	do.
3,900 Volt Steam Alternator of 100k.w. Capacity	Religate Town Council	S. Hart, City Engineer, City Hall, Dublin	do.
Stores	Blackpool Corporation	F. T. Clayton, Borough Surveyor, Municipal-buildings, Religate	do.
Refuse Destructors, Furnaces, etc.	Wembley U.D.C.	Blackpool Corporation, Engineer, Town Hall, Blackpool	do.
Road Works, Blandford and Crakel Roads	Plymouth Corporation	C. R. W. Chapman, Surveyor, Public Offices, Wembley	do.
Public Conveniences and Cloak-rooms, Lower-parade	Willesden District Council	Hue & Odgers, Lockyer-street, Plymouth	do.
Making-up London-road	East India Railway Co.	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
Two Blocks of Dwellings at Prince Rock	Bacup Corporation	C. W. Young, Secretary, Nicholas-lane, London, E.O.	Dec. 21
* Roadmaking and Paving Works	Barnet R.D.C.	W. H. Elice, Borough Engineer, Bacup	do.
150 ft. Deck Spans for Tonsie Bridge	Southeast-on-Sea Corporation	Council's Surveyor, 14A, Mount-view, High Barnet	do.
Brianna and Newline Sewer	Borough of Fulham	W. E. J. Heenan, Borough Electrical Engineer, Southeast-on-Sea	do.
Road and Sewer Works	Manchester Ship Canal Co.	Borough of Fulham, Fulham, S.W.	do.
Plant for Generating Station	do.	W. H. Hunter, Engineer to Company, 41, Spring-gate, Manchester	Dec. 22
* Road-making, etc., Hugon-road (Section 2)	Wimborne and Cranborne Guardians	W. J. Fletcher, Architect, Wimborne	do.
Switchboards, Mains, etc., at New Docks, Salford	Bridgend Hospital Committee	P. J. Young, Secretary, Bridgend-road, Bridgend	Dec. 23
Mains, etc., and Arc Lamps, etc.	Hul Corporation	A. E. White, City Engineer, Town Hall, Hull	do.
Heating Board Room at Workhouse	Newmarket U.D.C.	S. J. Emmon, Clerk, Deva Chambers, Newmarket	do.
Isolation Hospital at Cefn Hirgoed, Bridgend	Admiralty	Works Dept., Admiralty, 21, Northumberland-avenue, W.C.	do.
Abutments, etc., for Bridge and Subway, etc.	Osselt Corporation	W. Hancock & Son, Architects, Branch-road, Batley	Dec. 24
Orders, etc.	Wesley Corporation	Willcox & Baikes, Engineers, 63, Temple-row, Birmingham	Dec. 30
350 tons of Tar Paving Materials for Footpaths	West Sussex Rds. and Bridges Com.	W. McIntosh, County Surveyor, Worthing-road, Horsham	Dec. 31
* New Coastward Buildings at Langley	do.	do.	do.
Town Hall, Osselt	Liddesdale District Committee	F. H. Tallan, 35B, Kildare-street, Dublin	do.
Two Travelling Sewage Distributors	Tottenham, etc., Jt. Drainage Com.	A. Inglis, Architect, 12, Bridge-street, Hawick	do.
Materials	do.	P. E. Murphy, Engineer, 712, High-road, Tottenham	Jan. 3-05]
Cartage	do.	do.	do.
Heating New Public Library, Drogheda	do.	do.	do.
Fever Hospital at Newcastleton	do.	do.	do.
* Additions Press House, etc., at Markfield-road, N.	do.	do.	do.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be Delivered. Includes entries for River Wear Commissioners, Carnartheurshire Education Com., and various school repairs.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Includes Clerk of Works and Assistant Instructors in Manual Training.

Those marked with an asterisk (*) are advertised in this number. Competitions, lv. Contracts, iv. vi. viii. x. Public Appointments, xlx.

PRICES CURRENT.—Continued from page 617.

Table of VARNISHES, &c. listing various types like Fine Pale Oak, Pale Copal, and Superfine Pale Elastic Oak with their respective prices per gallon.

BRENTFORD.—For 750 yds. of blue Guernsey granite for the Urban District Council. Mr. Nowell Farr, Surveyor, Eldon House, Boston-road, Brentford.

Table with 3 columns: Per cube yard, Per cube s. d., and Per cube yard. Lists contractors like E. & H. Beevers, Fry Bros., and A. & F. Marnelle.

BRYNMAWR.—For erecting a public library for the Free Library Committee of the District Council. Mr. F. R. Bates, architect, Westgate-chambers, Newport.

Table with 3 columns: Completed road, Section of road, and Amount. Lists RAYNOR HILL and QUILTENTON, WARRINGHAM.

CATERHAM (Surrey).—For constructing a building estate road for Mr. C. Has. Asprey. Messrs. Thomas Dredgely & Sons, architects and surveyors, Westminster and Greenwich.

Table with 3 columns: Completed, Section, and Amount. Lists CHELL for workhouse additions by Messrs. W. F. Slater & W. H. Walley.

FAKENHAM.—For alterations to premises in the Market-place, Fakenham. Mr. W. J. Dunham, architect, Opie-street, Norwich.

HAYWARDS HEATH.—For sewerage and sewage disposal works for the Urban District Council. Mr. Baldwin Latham, engineer, Parliament-mansions, Victoria-street, Westminster.

Table with 3 columns: Name, Amount, and Name. Lists contractors like Norman & Burt, F. W. Irwin, and W. Griffith.

GRIMSBY.—For public conveniences at the People's Park, Grimsby. Mr. H. Gilbert Whyatt, Borough Engineer, Town Hall, Grimsby.

Table with 3 columns: Building, Amount, and Name. Lists contractors like R. Robinson, J. Butler, and R. G. Kitching.

GILBERT & KIRK.—For drainage. Messrs. Hewins & Good-hand, Grimsby.

Table with 3 columns: Supplying and Fixing W.C. Basins, Delivered, and Fixed. Lists contractors like T. B. Redshaw, Twofords, Ltd., and J. Duke, Ltd.

KILWINNING (N.B.).—For erecting new smallpox hospital for the Joint Committee of the Northern District Committee of Ayrshire Combination. Messrs. J. & J. Armour, architects, Irvine.

Table with 3 columns: Mason and Brickwork, Carpenter and Joiner Works, Plumber Work, Plaster Work, Roughcast Work, and Amount. Lists contractors like Gregory & Co., W. Connor, and J. Ramage.

LEATHERHEAD.—For road works, Lindon-road, for the Urban District Council. Mr. T. Salkield, Surveyor, Council Offices, Leatherhead.

Table with 3 columns: Name, Amount, and Name. Lists contractors like J. Mowlem & Co., Ltd., W. Morris, and F. Thacker.

LITTLE THURLOCK (Essex).—For making up Whitehall-road and College-road for the Orsett Rural District Council. Mr. F. Lowry, engineer, Hornchurch.

Table with 3 columns: Name, Amount, and Name. Lists contractors like A. Denkin, J. Jackson, and W. White.

TERMS OF SUBSCRIPTION. "THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 18s. per annum (12 numbers) BY PAID. To all parts of Europe, America, Australia, New Zealand, India, China, Japan, &c., 30s. per annum. Remittances payable to "THE BUILDER," 25, Abchurch-lane, London, E.C. 4.

TENDERS. Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100s., unless in some exceptional cases and for special reasons.]

BRIDGWATER.—For new cloak room and alterations to infant school, Eastover Council School, for the Education Committee. Mr. Francis Parr, Borough Surveyor, Bridgwater. Quantities by Borough Surveyor:—

Table with 3 columns: Name, Amount, and Name. Lists contractors like T. H. Parsons, S. Palmer, and C. Bryer.

BRISTOL.—For roads, paths, iron fencing, etc., at proposed cemetery, for the Parish Council. Mr. H. M. Bennett, surveyor, 36, Corn-street, Bristol.—

LONDON.—For heating apparatus for junior mixed school, Mantle-road, Deptford, for the London County Council:—
 J. Eason & Co. £560 0 0
 R. Clarke ... 400 0 0
 Wontner-Smith, Gray & Co., 332 0 0
 C. Rite & Co., 321 10 0
 G. & E. Bradley 311 10 0
 Bates & Sons.. 305 0 0

Brightside Foundry & Engineering Co., Ltd., £304 17 6
 J. Richmond & Co., Ltd., 30, Kirby-street, Hutton-garden* ... 298 0 0

LONDON.—For the docking and repair of the s.s. *Barrow*, for the London County Council:—
 Mills & Knight .. £735 0
 Fletcher, Son, & Fearnall ... 546 0
 London Graving Dock Co., £467 10
 J. Stewart & Son, Isle of Dogs* .. 467 0

LONDON.—For external restoration to St. Allegre Church, Greenwich. Messrs. Thomas Dinwiddy & Sons, architects, Westminster and Greenwich:—
 H. S. Holloway ... £910
 T. Crossin & Son .. £810
 T. D. Leng 842
 Kilby & Gayford* .. 628

RUBY.—For Baptist church and school, St. Andrew's-street, Rugby. Messrs. George Baines & R. Palmer Baines, architects, 5, Clement's-inn, Strand, London, W.C.:—

	Est. A.	Est. B.	Est. C.	Total.
	£	s.	d.	£
Coulson & Lott	5,783	12	0	5,795
P. Gough & Co.	5,514	0	0	5,514
Walton & Son	3,564	0	0	3,564
J. Hollowell	5,520	0	0	5,520
J. Thorwood	5,649	0	0	5,649
Poster & Dickson	5,513	0	0	5,513
J. Farnell & Son	5,342	4	0	5,346
Kerridge & Shaw	5,410	0	0	5,410
A. B. Cleaver	5,095	0	0	5,095
Linell & Son, Rugby*	5,106	8	0	5,114

Estimate A.—For the church, with lower part of tower only, and schools with vesties, etc., complete.
 Estimate B.—For upper part of tower, with end gallery and staircase.
 Estimate C.—For boundary fence walls, gates, railings, etc.

SANDOWN.—For erecting public library. Mr. James Newman, architect:—
 J. Meador ... £1,988 0
 W. & H. Simmonds .. 1,985 0
 T. & E. W. Jenkins 1,932 10
 Mussellwhite & Sapp, £1,000 0
 Brown & Corney 1,875 10
 E. James* ... 1,740 17

SANDOWN.—For house and shop, High-street, for Mr. F. H. Masters. Mr. James Newman, architect:—
 G. New £1,500 0
 W. & H. Simmonds .. 1,420 0
 Brown & Corney .. £1,380 10
 Corney* 1,380 10

SANDOWN.—For villa residence, for Mr. John Mew. Mr. James Newman, architect:—
 Brown & Corney ... £748
 L. A. Moorman, jun. 685
 J. Payne* 1815

SANDOWN.—For terrace of three small houses, Station-avenue. Mr. James Newman, architect:—
 L. A. Moorman, jun. £1,045
 Brown & Corney .. 997
 H. Attrill 945
 J. Payne 1930
 G. New* 765

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SANDOWN.—For alterations and additions to house and shop, Melville-street, Mr. James Newman, architect:—
 Brown & Corney £249 0
 J. G. New* £200 10

STOCKTON-ON-TEES.—For private street improvement works, for the Corporation. Mr. M. H. Sykes, Borough Engineer, Town Hall, Stockton:—
 M. O'Doherty, Stockton £126 9 8

SWINTON.—For making-up Frederick-street and Cowood-street, for the Urban District Council. Mr. R. Fowler, Surveyor, Council Offices, Swinton, near Rotherham:—
 Shaw, Cliff & Smart £1,081
 J. Rothery 1,003
 Addis Bros. 1,001
 G. Brookes £820
 Green Bros., Rother- ham* 813
 [Surveyor's estimate, £854.]

WARE.—For paving footways, Kibes-lane, for the Urban District Council. Mr. J. Elliott Smiles, Surveyor, New-road, Ware:—
 Victoria Stone Co., Ltd., Hamilton House, Bishopsgate-street Without, E.C. £122 12s.

YARDLEY.—For Cole Hall sewage disposal works (Contract No. 2), for the Rural District Council. Mr. A. W. Smith, Engineer, Council House, Sparkhill, near Birmingham:—
 Sutherland & Thorpe, 31, Bear-wood-road, Smeethwick* £1,233 19 9

YARDLEY.—For the sewerage of Acock's Green, South-East, for the Rural District Council. Mr. A. W. Smith, Engineer, Council House, Sparkhill, near Birmingham:—
 Langley, Hardy, & Johnson, Leicester* .. £1,844 10

YORK.—For water supply to the City Asylum, for the Visiting Committee of the Corporation. Mr. A. Creer, City Engineer, Guildhall, York:—
 Ashwell & Nesbit, Great Central-street* £1,717 10

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The Builder.

VOL. LXXXVII.—No. 3228.

DECEMBER 17, 1904.

ILLUSTRATIONS.

East Window, All Saints' Chapel, St. Chad's, Gateshead	By Miss Caroline C. Townshend,
Westbury Abbey, Bucks	Mr. Clyde Young, A.R.I.B.A., Architect.
Front in Tottenham Court-road	Messrs. Read & Macdonald, Architects.
Front in Oxford-street and North Audley-street }	
House at Headingley, Leeds	The late F. W. Bedford, F.R.I.B.A., Architect.

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An Appeal to the Profession.



As we mentioned last week, the Institute of Architects has so far advanced from its non-committal attitude in regard to the question of the ownership of architects'

drawings, raised in the case of *Gibbon v. Pease*, as to have passed a resolution to follow the lead of the Surveyors' Institution in promising a contribution of 100% towards the cost of endeavouring to get a reversal of the verdict, or an order for a new trial, in the Court of Appeal. But we think that a direct appeal should be made to the profession at large to assist in this matter.

The Court of Appeal, should its decision be favourable to the defendant's case, may, if we understand rightly, take one of two courses; it may either overrule the precedent of *Ebdy v. McGowan* and decide that it does not apply, or it may order a new trial on the ground that the evidence on one side was not heard. The former would be of course the far more satisfactory as well as the least costly result, but the latter is the more probable; and in that case the pecuniary support promised by the two representative professional Societies would probably fall very far short of what would be required to carry out the campaign.

On this consideration, we revert to the suggestion made a week or two back by our correspondent "A Provincial Architect," that we should open a fund for assisting the defendant in this action to obtain a reversal of a legal decision which, if it is allowed to stand, will involve a most serious injury to the

interests and prestige of architects. We wish architects clearly to realise that, by the law as it is now apparently to be interpreted, *any client may claim all the architect's drawings, and specification, and sketches and memoranda in reference to a building as his own property*, and may, if he be so minded, bring the architect into court and obtain an order on him to give them all up. This state of things affects, or may affect, most prejudicially every architect in the United Kingdom, and nothing ought to be left undone to get it altered. On this ground therefore we beg to say that we shall be glad to act on the suggestion made by "A Provincial Architect," that the editor of this journal should invite and take charge of subscriptions to be applied towards the cost of obtaining a definite decision in reversal of the present assumed reading of the law in regard to the ownership of architects' drawings. A special bank account would be opened for the fund, and a full report published subsequently as to the receipts and application of the fund. The Provincial Architect whose letter we published backed his suggestion by a cheque for five guineas; how many will follow his example?

We said just now the "assumed" state of the law, because we think that the decisions which have caused so much consternation to architects are really the result of a reading of the judgment in *Ebdy v. McGowan* apart from the circumstances and the evidence. We have been told by lawyers, in the most positive manner, that the judgment in that case affirmed the client's property in the drawings without any reservation whatever. So it does if you read it alone; but surely the logical interpretation is to read it in connexion with and in relation to the evidence and the circumstances of

the case, which was one in which drawings were completed and the building not carried out; and we do not think the ruling logically goes any further than to cover that particular case.

If it does; if it is to be upheld that *Ebdy v. McGowan* covers every case and gives the client the ownership of all drawings, then we say that such a law could only have been passed under the influence of a misunderstanding of the architect's profession on the part of those who administered the law, and that we must get this point pressed upon those high authorities who have the power to order a revision of the law. For this purpose it might be necessary to take the matter ultimately before the House of Lords; which is all the more reason for being prepared with the sinews of war. We are told by lawyers (some of them—for lawyers differ like other mortals) that the House of Lords would not be likely to reverse a law which has stood accepted for so long a period—reckoning from *Ebdy v. McGowan*. We reply, that it has only been tacitly accepted through ignorance of the fact, and that few or no architects had any conception that such a sword of Damocles hung over their heads; Then there is the example given by the law in other countries. In both France and Germany the practice is for the architect to keep the drawings; there are certain reservations, which we have not space to go into just now, under which the client may ask for copies of the drawings or of part of them, but only either under special restrictions or by special payment over and above the fee for carrying out the building. No other country permits the architect to be ridden over and his rights trampled on as our law, if correctly interpreted, does; and if it does stand so, it is time it were altered.

THE CARE OF ANCIENT MONUMENTS.

BY PROFESSOR BALDWIN BROWN.

II.

IN the last paper some notice was taken of the popular movement on the Continent for the protection of buildings of historical and artistic interest. In the present article it will be seen how foreign States endeavour to compass the end in view through official agencies such as Monument Commissions, and how some continental cities safeguard their historical aspect by special building regulations. The subject of State Monument Acts, with the contrast between our own legislation and that of our neighbours across the sea, will occupy the third paper of this brief series.

In almost all continental countries the normal system of monument administration centres in a State-appointed Commission, that serves as a council for the Minister under whom is placed the department of the Fine Arts. The Minister in question may be Minister of the Interior, or of Religion and Education, or of Public Works, but there will always be some responsible head of a public department who takes historical and artistic monuments under his charge. He is the executive officer in any question relating to this subject, but acts always after taking the opinion of his Commissioners. The Commission, on the other side, is served by a body of inspectors and local correspondents, and sometimes by trained architects, who supply it, as it were, with eyes and hands. In certain countries, as in Switzerland, the already existing council of some proved antiquarian body of national scope is charged with the functions of a State Commission, while in others a Commission is made up for the purpose from known experts in historical and artistic studies. Many of these Commissions are of old standing. That of France, the "Commission des Monuments Historiques," dates from 1837. The "Central Commission for the Investigation and Maintenance of Artistic and Historical Monuments," of the Austrian Empire, may serve as a type of the rest. This was founded in 1850, but received in 1873 the form which, with certain alterations in 1899, it now possesses. There are twenty members chosen for five years, and the service is an honorary one. They are aided by a staff of 146 "conservators," while 348 "correspondents" are distributed about the different districts, 167 in number, into which, for this purpose, the provinces of the Empire have been divided.

It is the duty of the conservators to keep in touch with local societies and individuals, and to influence public opinion everywhere in favour of the safeguarding of the memorials of the past. They have to form inventories of the treasures existing in their districts, to secure for the Imperial museums movable objects, especially of classical antiquity, that from time to time come to light, and to deal in the best manner open to them with all questions of the restoration and upkeep of architectural monuments. One of their functions is to report to the Commission upon projects for new railways, roads, and other

public works, in view of any injury that these may threaten to ancient monuments. For ordinary purposes the Commission has a fixed income, but for any special demand an appeal may be made to the Minister of Religion and Education. In the case of one monument, the most important in the whole Empire—the palace of Diocletian at Palatino, in Dalmatia—there is a project for independent legislation, and in the spring of 1903 a special committee of experts spent fourteen days in examining the building and drawing up a report on its condition and requirements. The Central Commission issues as its main publication the well-known and valuable *Mitteilungen*, and, besides this, publishes in each year a report on its operations.

It is important to note that the Commission and its conservators can make no attempt to exercise compulsion on private owners of monuments. The conservators are charged to deal with these by way of persuasion and tactful management, so as to secure as far as possible that private monuments shall be as well treated as those actually the property of the State. They possess at their back, however, no legal powers. In this respect the Austrian Commissioners differ from their brethren the members of the French Commission des Monuments Historiques. For the half century from 1837 to 1887, the latter worked as the former work now, armed with official authority, but without direct legal powers of compulsion.* In the last-named year was passed the French law on historical monuments, which gave to the Minister of Public Instruction and of the Fine Arts, under whom the Commission acts, certain legal powers in favour of monument preservation. A notice of some of the chief provisions of this law will be given in the succeeding paper.

Prussia is another country where there is no Monument Act, but an organised system of conservation by means of provincial agencies, and the same applies to nearly every one of the German States that hold together under the Empire. One important department of monument administration is in Germany particularly advanced, and this is inventorisation. In nearly every case, it is one of the chief functions of the State-appointed Commission to draw up a list of the historical and artistic monuments within the limits of its survey. In Holland, only last year, there was established a "Rijkscommissie," under the presidency of the distinguished architect, Dr. P. J. H. Cuypers, charged to draw up without delay a summary inventory of all artistic and historical monuments in the country, both immovable and movable, to be followed by a full publication of the more important objects. 1850 is the limit of time up to which monuments of value may be included, and these are roughly classified as:—(1) Pre-historic and Roman; (2) town walls, gates, etc.; (3) castles; (4) civic structures of a public kind; (5) churches and charitable institutions; (6) private buildings; (7) miscellaneous objects.

* Indirect powers of compulsion, through the process of compulsory purchase or expropriation, had always been at the command of the French Government. See *infra*.

It needs hardly to be said that no State inventory will be likely to take note of all the older domestic buildings and interesting details to be found in the towns and villages of the dominions. The great German State-subsidised publications, which are so numerous, deal, as a rule, with monuments of public importance. In all the German kingdoms and duchies these official inventories are in progress, and some of them are on a monumental scale. The number of separate works is nearly fifty, and in 1901 it was reported that the tale of volumes would soon reach 200. Distinct from these are the inventories that certain towns have drawn up of their ancient buildings and other artistic treasures. The Commissions and Societies mentioned previously at Paris, Vienna, and Lyons are engaged in this work. Hildesheim and other German cities have such inventories, and a list of all the old houses in Cologne is used effectively in the interests of preservation.

We are brought into contact here with an interesting phase of the general movement for the care of monuments in European lands—the independent activity in self-protection of the older towns. "Monument" is a convenient general term, embracing all the objects of the pious and patriotic activity under notice, but a distinction must be drawn between the comparatively few monuments of outstanding importance, which would find a place in any State inventory, and the numerous examples of antique civil and domestic architecture, and relics of military works, which, singly of small importance, combine to give their historical aspect to our older cities. With these, not the State, but the town or district has to deal, and the attention paid to structures and relics of this kind is a marked feature of the modern German "Denkmalpflege."

As compared with France, Germany is a decentralised country. The numerous States included within the Germanic Empire have their own bodies of domestic legislation, and Monument Acts are matters for each State to consider for itself. Furthermore, within the several States, the towns have a considerable amount of independent life of their own, fed by memories from the days when each was for practical purposes a self-governing community. There was an epoch not long ago when the State seemed disposed to take everything into its own hands, and the independence of the towns was seriously curtailed; but there came a reaction from this, and, as a consequence of the so-called "Dotationsgesetz" of about 1875, the towns have come now to manage their own affairs with considerable freedom and spirit. Hence there is in Germany a town "Denkmalpflege," as well as a State "Denkmalpflege," and in connexion with this there emerge matters of much practical interest to ourselves in Britain.

All civilised States possess Local Government Acts under which the different civic communities are empowered to make their own by-laws, of course within limits fixed by the Acts. In some of the German States these general Acts appear to allow, and even encourage, local authorities to make by-laws in the interests of amenity, while others do not

directly authorise such a proceeding. In Prussia proper the general Local Government Act is unfavourable, and only allows municipal authorities to forbid any absolute open disfigurement of a town (Verunstaltung), more refined aesthetic requirements not being covered by it. In Hanover, on the other hand, in which province lies Hildesheim, the Prussian law is not in force, and the regulations which there obtain allow of building prescriptions that take full account of aesthetic demands. Building Acts in Württemberg and Hesse are also said to be favourable to those who desire to restrict the freedom of constructors or destroyers in the interests of piety and good taste. In the Kingdom of Saxony, a general Building Act was a year or two ago under consideration, and the draft of this Act contained provisions perhaps in advance of any others in Acts of the kind:—"Building operations which threaten to involve an open disfigurement to a place can be forbidden. By local regulations there can be fixed a higher architectural standard for new buildings to be erected in certain streets or parts of streets."

Bavaria seems to be the classic ground for these local prescriptions, and the older cities of the kingdom, which are some of the most famous in Europe, cities such as Nürnberg and Augsburg, have taken full advantage both of the favouring general laws and of the benevolent attitude of the Government, and have framed local building laws in the interests of amenity of a somewhat drastic kind. On January 1 of the present year the Bavarian Ministers of the Interior and of Religion issued a joint minute with directions to local authorities which would have delighted the soul of the late William Morris. Civic and communal authorities are recommended to frame their local regulations on the following general lines:—

"(1) The ancient works of fortification, with their fosses, city walls, gates, towers, and all thereto appertaining, are to be preserved as carefully as possible; for every constructive alteration on them permission must be obtained.

"(2) Constructive alterations, interior or exterior, on other buildings of historical or artistic importance must depend on official permission. It should be a condition that, in rebuilding or alteration, the style and character of the original must be conformed to.

"(3) In the case of all new buildings or alterations in the vicinity of the fortifications, or of structures mentioned in the last paragraph, the character of the latter must be taken into account. Especial attention should be paid here that the new fabric should, as regards its proportions, take its proper place in the general picture, and in its details and ornament should be in harmony with the older surroundings. In order to avoid anything that would offend the eye in the general view of the town, the form and material of the roofs should be carefully considered.

"(4) When new lines of houses are in contemplation, care should be taken to safeguard the picturesque views of streets and open spaces, and the tyranny of the engineers' rule and level must of course be resisted. In general, in the

case of all new buildings, especially in the older parts of cities, it should be made a matter of duty to adhere as closely as possible to the traditional building style of the place, and in this connexion again the form and the covering of the roofs become of importance.

"(5) In the case of new buildings in other (suburban) situations, especially when fresh quarters have to be laid out, it would be enough to keep general aesthetic requirements in view. Directions, however, in such matters as the proper plastering of rubble walls and the correct slope of mansard roofs would always be welcome."

It should be understood that the minute from which the above has been extracted is not issued by any militant society for the protection of ancient buildings, or by some individual lover of monuments, such as William Morris, but is the combined production of two responsible Ministers of State in a European kingdom. Moreover, cases have recently arisen in which the Bavarian Minister of the Interior and the upper courts of law have upheld the towns in the enforcement of their local regulations, when interested parties have called these in question. Thus at Nürnberg in 1899, on the occasion of a peril which threatened the so-called Nassauer Haus (opposite the western end of the Lorenz Kirche), the magistrates issued an order which forbade any alterations either in the interior or on the exterior of a historical and monumental building without leave of the local authorities. This order was appealed against to the law courts, but the decision of the magistrates was upheld, and it was stated that the Minister of the Interior approved of the magisterial proceedings.

No discussion of the kind in Germany can be complete without the pronouncement upon it by the Kaiser. On the occasion of an Imperial visit to Hildesheim in 1900 august lips framed some excellent sentences in praise of the care the citizens were taking of their older monuments:—"I congratulate the citizens on the civic spirit which dwells in this town, for from their ancient buildings, their reverend churches, their noble town hall there breathes to us, not a sophistic imitation of antiquity, but the impression of the great and beautiful."

The question of the general policy of such local regulations in the best interests of monument preservation is one on which a good deal might be said. It is worth noting that it is fully recognised in Germany at large, for it is not only Bavaria that is concerned, that proper care must be taken in the framing and enforcement of restrictive ordinances of the kind. They may easily go too much into detail, and may lay down the law on matters on which people of good taste may take different views, or they may be applied too widely, without observation of the distinction noted in the Bavarian minute between the old parts of towns, where a jarring note may too easily be struck, and new quarters, where more freedom can be allowed. Again they may be enforced too often and too rigidly, and, by producing a feeling of irritation in the minds of the citizens, do more harm than good.

The municipal authorities of Hildesheim, in the province of Hanover, now under Prussian rule, have an elaborate set of local building regulations in the interest of amenity, and they consulted the Prussian Minister on their proceedings. He replied in encouraging terms, but at the same time advised them to use tact and caution in the enforcement of their restrictions.

Local building regulations of the kind contemplated are in operation in the Bavarian towns of Augsburg, Würzburg, Nürnberg, Rothenburg, Amberg, Lindau; also in Frankfurt, Hildesheim, Danzig, Lübeck, and other places. Most of them wisely limit the restrictions to the central and oldest parts of the cities. A few go rather too much into detail, and lay themselves open to the charge of pedantry.

Several of the towns in Bavaria and in other parts of Germany are like professional beauties whose face is their fortune, and they depend for a good part of their prosperity on the visitors attracted by their picturesque charm. Rothenburg on the Tauber and, to some extent, Hildesheim and Nürnberg are in this position. The preservation of this charm is accordingly a matter of enlightened self-interest, and the citizens have wit enough to recognise this fact. One wishes that the same recognition were more common among the citizens of our own older towns, such as Chester and Edinburgh. It is of more practical interest to ourselves to note that some important and busy cities, which are by no means run on antiquarian lines, are adopting the same measures for the preservation of their older historical features. Frankfurt, for example, which has been so transformed within the last twenty years that a visitor would think there is not an old house left in it, has awakened to a sense of the irrevocable loss she has been suffering, and is determined to preserve what she has left of her beautiful antique structures. The following is a local ordinance for Frankfurt-am-Main issued in the year 1900.

"Sec. 1.—For the preservation of the artistic and antique character of the following historically interesting streets and public places (here follows a list of seven such localities), all buildings which are to be erected thereon, in so far as they are visible from the street, must be so treated externally that the existing aspect of the streets be not disfigured or essentially altered. For the attainment of this end, the authorities may limit the otherwise legal height of the building, or of its stories.

"Sec. 2.—These provisions apply also to the case of alterations in older structures which already agree with these prescriptions, as well as to the case of important alterations, enlargements, etc., on buildings which do not yet agree thereto. (In the last case the authorities may in certain circumstances relax these restrictions.)

"Sec. 3.—The local authorities shall decide whether the above prescriptions have been fulfilled, and, before their decision, they must consider a report from a special civic commission, consisting of the custodian of the city antiquities, a member of the civic commission for art and antiquities, two members of the

association of architects and engineers, and one member from the magistracy, who acts as president."

In the instance of Lübeck, where new building regulations were issued in 1903, regard is had to the natural surroundings of the city as well as to its architectural character. The following are extracts:—

"All new buildings and additions to existing structures must, on every side that is visible from thoroughfares or public places, be so carried out that they do not injure either the aspect of the streets or the natural surroundings of the city, nor injuriously affect the appearance of existing buildings, especially those of historical value.

"Placards, posters, bills, and other such arrangements for advertising, or coloured surfaces that disfigure the streets or the landscape, or injuriously affect historic buildings, are prohibited."

In connexion with the treatment of those of our own older towns in Great Britain in which new interests are in conflict with the old, it is interesting to note what is being done in Mainz on the Rhine, a town which has greatly increased of recent years, and has been considerably altered by the change in the situation of the railway station. Mainz is in the Grand Dukedom of Hesse, and therefore in a region covered by a recent State Monument Act, of which an account will be given in the next paper of this series. It is also under the oversight of an official Conservator of Monuments for Rhenish-Hesse, and contributes members to the Council on Monuments of the Hessian State. A few months ago the Conservator issued a report on Mainz in 1903, in which, after discussing sundry problems connected with old buildings and new improvements, he goes on as follows:—

"Other works are now in preparation. Thus, in last January there was set on foot a systematic survey of all public monuments of architecture and of those private buildings which are to be included in the official schedule of monuments, in relation to their position in the general lines of the streets (im Strassenbild) and to the alterations in the direction and the width of streets which will be necessary within the next ten years. This procedure will be kept in operation, so that the effect on the general aspect of the streets of any unavoidable alteration in the main lines of communication may be carefully considered as part of a general scheme, and not in a hap-hazard way just when occasion arises. By these means it will be possible in the fullest measure to secure the preservation of the historical character of the city by safeguarding all existing buildings of importance and keeping new structures to a style in harmony with the old."

WESLEYAN CHAPEL, BARROW.—A new Wesleyan chapel has just been opened at Barrow. The building is in the Gothic style of architecture. The exterior is of red Ruabon brick, faced with terra-cotta ornamentations. The roof contains an ornamental turret, constructed for ventilation purposes. The interior contains seating accommodation for about 120 people. The fittings are of pitch-pine, and the windows contain cathedral glass with coloured margins. The flooring is of modern blocks. In addition to the chapel is an adjoining schoolroom, which, by a removable partition of wooden shutters, can be made as part of the chapel. Messrs. Lockwood & Sons were the architects, and Messrs. G. Wright & Sons, Kelsall, the contractors for the work.

NOTES.

The Proposed
Shakespeare
Memorial.

It is proposed to erect a great architectural and sculptural monument to the memory of Shakespeare, on some site to be selected in London. Such an idea ought to be enough to inspire artists to their highest efforts, but it is amusing to see how already the typical English mind, with its usual dread of art, is aroused in opposition to the idea. The *Spectator*, a paper essentially political and literary, publishes in its last issue an article throwing cold water on the scheme, and demanding that something "useful," like a memorial library, should be erected. That is so very English. The *Spectator* doubts whether we shall get anything good, and scoffs at the London public statues as now existing, not being apparently the least aware that English sculpture has made immense progress in the last twenty years, and is now second only to French, and not far behind that. The most characteristically English idea of all is the insinuation that a monument to Shakespeare is not to be made a mere opportunity for artists to exhibit their talents. The idea that a noble artistic monument is a gain to the nation, and not a mere advertisement for artists, seems to be beyond the writer's perception.

Party
Walls.

THE Court of Appeal in the case of *Leadbetter v. Marylebone Corporation* have given an important decision under the London Building Act, 1894. The plaintiff and defendants owned freehold premises adjoining. The house on the plaintiff's land was pulled down, and the building operations necessitated the rebuilding of the party wall and the construction of one of greater strength, and a notice under section 90 of the Act was served by the building owner upon the defendants. The defendants were contemplating building operations which would require the wall to be of exceptional strength, and they served a notice upon the building owner under section 89 setting out their requisitions. The questions between the parties were submitted to arbitration under section 91, and the arbitrators' two surveyors gave their decision, by which an exceptionally substantial wall was to be erected, the extra thickness to be on the defendants' land, but they further awarded that the defendants were to have the right to raise the party wall at any time as they might desire. About two years later the defendants, having commenced their building operations, proposed to raise the party wall, but the plaintiff objected on the ground that the latter part of the award was *ultra vires*, and they claimed to be entitled to a building owner's notice under section 90 of the Act. The Court supported this contention, holding that section 91, which gives the surveyors power "to determine the right to do, and the time and manner of doing, any work and generally any other matter arising out of or incidental to such difference" to be limited to the work in respect of which notice has been given and not to confer a power to determine the rights of the parties generally and at any time. The Court also construed section 95 as applying not to an

alteration in the structure of a party wall but only to increased user of an existing wall. This case emphasises the point that the arbitrators must be careful not to exceed their powers. In *Stone v. Hastie* (see our Note October 31, 1903) the Court of Appeal decided that arbitrators in determining the rights of the parties under section 91 must confine themselves to the questions raised in the building owner's notice, and have no power to award a sum in respect of extra user of a party wall.

Hire and
Purchase
Agreements.

IN our issue of April 4, 1903, we commented upon the case of *Lyon v. London City and Midland Bank*, and the law relating to hire and purchase agreements of fixtures when the premises to which they have been affixed have been mortgaged by the hirer. The latest decision on the point is that of the House of Lords in the case of *Reynolds v. Ashby and Son* (Current Law Reports). The appellant had let certain heavy carpenters' machinery on a hire and purchase agreement to the lessee of certain land, who had built a factory thereon. The machinery was bolted down to a concrete bed by means of bolts imbedded in the concrete, which passed through holes in the machinery, which was held down by nuts. The factory owner or builder had previously mortgaged the premises, and subsequently the mortgagees took possession of the premises, and default having been made in payment of the sums due under the purchase and hiring agreement, the issue was raised as to who was entitled to the machinery, the lessor of it or the mortgagees of the premises. It was contended that since the hirer of the machinery had not paid for it, he could not mortgage it, but the House of Lords, whilst admitting that the law as laid down in the decisions was not satisfactory, held the principle as between mortgagor and mortgagee to be too well established to enable a departure now to be made, and since the machinery was affixed to the freehold, and the mortgagees had entered into possession before the lessor of the machinery had reclaimed it, decided in favour of the claim of the mortgagees. It must, however, be carefully noted that in this case there was nothing in the hire and purchase agreement showing the intention of the parties that the machinery was not to become attached to the freehold. In *Lyon's* case, which the House of Lords in this decision approve, there was such an intention to be gathered, since the things let were capable of being used as movables, and were only fixed to the freehold at all owing to the order of an independent party, the Town Council. The law is now settled, and it is useless to point out that it is unsatisfactory in that the mortgagee who advances money is the person really to be put on inquiry as to the security he is taking, whilst the lessor of machinery cannot know if it is being mortgaged or not. The only practical lesson to be learned is that lessors of such articles should take care clearly to express their agreements in such a way that the articles hired out may remain chattels and not become fixtures.

Motor Traffic. PUBLIC bodies who have sunk large sums of money in tramway tracks and equipment may be recommended to consider some of the points made in the lecture recently delivered by Mr. C. S. Rolls. Quite apart from the great possibilities of the motor vehicle in connexion with traffic between large cities and outlying country districts, and with the conveyance of light merchandise, it is perfectly clear that the motor omnibus has many advantages over the tramcar for urban and suburban highways. When the streets are narrow, as at Hackney, Brentford, and elsewhere in London, and in towns such as Ipswich, the tramway system is nothing less than an intolerable nuisance. Even in wider thoroughfares tramcars form a serious obstacle to traffic, and particularly so when, as often happens on the southern lines of the London County Council, a breakdown fills up any of the routes with a standing succession of cars half a mile or more in length. So far as can be judged at the present moment, the motor omnibus is the public vehicle of the future, and the sooner municipal authorities recognise the correctness of this forecast, the better it will be for the pockets of the ratepayers and for the convenience of the general public.

Street Widening in the West-End. JUDGING by the strong recommendation contained in the recent report of the Improvements Committee of the London County Council, there is reason for believing that the widening of the last remaining narrow portion of Piccadilly will be taken in hand without unnecessary delay. The thoroughfare in question is an important part of the main highway between Piccadilly-circus and Hammersmith. But it should be remembered that it is not the only part requiring attention, for in spite of improvements on the southern side, Knightsbridge still offers a considerable obstacle to through traffic. An opportunity too good to be lost now exists for securing an important area on the northern side, where the leases of several houses have fallen in. These buildings are situated between the park railings and the French Embassy, and before definite arrangements have been made for the erection of structures on a larger and more costly scale, it is very desirable that the site should be secured by the authorities. Part of the land could be added to the park, and part used for the much-needed street widening. We are glad to observe that a petition has already been presented to the Commissioner of Works and the London County Council, advocating the necessity of the improvement, and, although no evident result has followed, we trust the authorities jointly interested will not allow this golden opportunity to pass by.

A Concrete Railway Viaduct. At the meeting of the Institution of Civil Engineers on Tuesday this week the application of concrete to bridge building was discussed in a paper, read by Mr. A. Wood-Hill and Mr. E. D. Pain, describing the construction of the Cannington

Viaduct on the Axminster and Lyme Regis Light Railway. This viaduct includes ten three-centred arches each of 50-ft. span and 16-ft. rise, and has a total length of 600 ft., while the maximum height to rail level is about 92 ft. The arches spring from piers of mass concrete supported on concrete foundations of dimensions calculated for earth loads ranging from 1½ to 3 tons per square foot beneath the various piers. In the construction of the vertical faces of the arches concrete blocks were employed, with the object of simplifying and reducing the cost of the centring, the haunches and all other parts being formed of mass concrete. For the purpose of providing for expansion, four joints were made in each arch, one at each springing and two on either side of the crown. We doubt the advisability of constructing piers of mass concrete, for any undetected flaw or fault caused during the progress of the work, or developed after its completion, must involve the most serious consequences. On the other hand, if piers be built up of concrete blocks made long enough beforehand to enable their condition to be definitely ascertained, there should be every reason for confidence in the security and durability of the masonry. It was stated by the authors that the foundations were originally designed for an earth pressure of 3½ tons per square foot, this being afterwards reduced, by enlargement of the foundations, to the values mentioned above. That still further reduction would have been advisable is shown by the fact that the west abutment and the adjacent pier settled to such an extent as to crush the crown of the first arch. We wonder that the engineer responsible for the design did not think of adopting concrete-steel foundations, which would have permitted considerable lateral extension of the footings without extra expense. With some criticisms that were made on the appearance of the viaduct (by an engineer who thought his own viaduct more beautiful) we do not by any means agree. There is nothing to object to in it at all, and it forms, in fact, a picturesque feature in the landscape.

Kirkstead Abbey Church, Lincolnshire. A FUND is about to be opened for the proposed reparation of Kirkstead Church, near Tattershall, which has been closed, by reason of its untoward condition, during many past years. In the earlier half of the XIIIth century Hugh Fitz-Eudo, surnamed Le Breton, a son of Eudo, a follower of the Conqueror, founded a Cistercian Abbey in Kirkstead, dedicated to St. Mary the Virgin, which at the dissolution was valued at 338*l.* 13*s.* 11*d.* per annum. The abbey church then became the parish church of the village, as a "peculiar" in the private property of the owners of the estate, and for a long period during the XVIIth and XVIIIth centuries it was used as a Presbyterian chapel. The walls are now out of the perpendicular, and the stone vaulting is in danger of falling down. The principals are carried by dwarf shafts resting upon a string-course, and divide the ceiling into four square compartments. The mutilated effigy of Robert de Tattershall, 1212, is a valuable

exemplar of armour of that period; the suit of rare banded mail is covered with a short surcoat; the head, wearing a cylindrical flat-topped helmet, rests upon a cushion.

Mr. Clausen on Painting. MR. G. CLAUSEN's lecture on the "History of Painting" at the London Institution on Monday afternoon was to a considerable extent a repetition of points from his Royal Academy Lectures, put in a somewhat more popular form; but there was a distinct aim pervading the discourse. The History of painting, as he said, was far too large a subject to be even sketched in outline in one lecture; he only aimed at showing how early as well as infantile work was confined to a hald transcription of facts; how there was evidence that the ancients did understand modelling by shadow, an art which was lost in the dark ages, and slowly revived again by the early (not the earliest) Italian Renaissance painters. He pointed out too, and illustrated with examples, how like Japanese art, so far as it dealt with figures and landscape, was to the earliest Renaissance art and to the drawing of clever children; an example of the latter class of work, thrown upon the screen, was exceedingly characteristic in its mixture of really very correct outline with the entire absence of surface modelling; the face all one colour, the dress all one colour, laid on flat. We rather wish, however, that Mr. Clausen would not go about telling audiences that the distinction between pictorial and decorative painting is only imaginary. It is a conclusion which seems to us contrary to visible facts. All pictorial pictures should in a sense, no doubt, be decorative; but decorative pictures are not pictorial: there is a distinct difference of aim possible in works which may nevertheless each be admirable in its way. Decorative painting is that in which something of natural effect has been left out in order to assimilate it more closely with architecture. It is exactly analogous to the conventional treatment of floral forms in ornament. Nor can we accept it as a decorative merit that some of the Renaissance painters would carry on the solid architectural features of an interior into their pictures in order to make them more essentially a part of the decoration. It is interesting as an occasional characteristic of painters of the period, but it is after all a kind trick-of-illusion, and if a modern painter did the same we should call it had art.

Drawings by Mr. A. H. Hallam Murray. WE suppose we are to regard Mr. Murray, who is connected with the eminent publishing firm in Albemarle-street, as an amateur artist; but if so, he is an amateur of quite unusual powers. His collection of water-colour drawings exhibited at the Fine Art Society, under the title "On the Old Road through France to Florence," shows work both in landscape and architectural subjects of the greatest beauty and delicacy, and the treatment of architecture is especially satisfactory. That showing the Romanesque arch at Aix in Provence (28) is quite an ideal hit of architectural

water-colour in regard to drawing, colour, and texture. "Narbonne—le Canal des Deux Mers" (30) is noticeable equally for its charming and real effect of sunlight and colour. Among others that we noticed particularly were "Amboise" (2); "Cahors" (7), with the two square towers white in the sunshine; "Cheou-ceau" (13), the château so picturesquely but not wholesomely built on arches over a river; "Valence" (32); and "San Domenico—view across the plain" (54). All, however, are good, and architects should find a great deal of interest in an exhibition of drawings dealing so largely and so ably with picturesque architectural subjects.

THE exhibition of the Women's International Art Club at the Grafton Gallery is, we think, a better one than last year, though its interest is really confined to the works of but a few exhibitors, the rest being a collection of mediocrities. The International element is not very prominent, nor are the foreign pictures among the ornaments of the collection, excepting Middle. Fortunée de Lisle's "Réveuse" (46) and "A Merovingian Princess" (139), a portrait in water-colour, and Miss or Middle. Kinsella's frame of very clever sketches at Bizerta; and both these ladies with foreign names date from London addresses. Of the pictures actually sent from abroad, the German are mostly such as one endeavours to forget. Mrs. Deric Hardy has a clever life-size pastel study of a woman with a nude infant, "Summertime" (44); Miss Vera Christie exhibits a good portrait of a pretty lady (75), and Miss Clare Atwood a very good work of the same kind; and Miss Robertson, an English lady painting in Paris, though two of her portraits show that studied avoidance of all charm or beauty of colour which seems to be the aim of one set of Parisian artists, surprises us agreeably by one portrait (388) which presents interest both of colour and character, and is quite different from her other works. Miss Gloag's child with the angels round its cradle (109), illustrating a well-known pious nursery rhyme, is more successful as regards the infant than the angels, but the picture has its attractions. Miss Atwood's "The Inventor" (127), as a study of an imagined type of person, is very clever and original; a character in a novel might be founded on it. Besides these, the best things are landscapes, mostly small. Among these are Miss Molony's "By the River" (77), a picture which is Corot in composition but not in texture; Miss Anna Birch's "Wayside Study" (98); Miss Evelyn Howard's three studies, two sunsets and a dawn (153 to 155), hung together, make a most attractive group, showing sentiment and poetry as well as facility with the brush; Miss Hagarty's "The Marsh Meadows" (174), "The Village by the Sea" (239), and—the best of all—"Changing Pastures" (354), a really beautiful water-colour landscape; Miss Warrack's "The Baptistery, St. Marks, Venice" (179), a well treated architectural subject; Miss Hoyland's trio of landscapes (183 to 185); Miss Kirkpatrick's "In St. Ives Harbour" (217); Miss Mary Barton's "Above Rapallo"

(238); Miss Lancaster-Lucas's "In Brittany" (294) and some others; and Miss Barbara Porter's "Rye Harbour" (311), a comparatively large work of much excellence, especially noticeable for the force and realism with which the boat rowing up to the foreground is shown. Miss Gloag, whom we have already mentioned, has also a very clever study of "Launce and his Dog" (258), superior to her baby and angels picture. At the end of the further gallery is a small collection of sculpture, in which Miss Roper's work is predominant and is all charming; and the "Seaside Studies" of Miss Emmeline Halse is a clever bas-relief panel of nude children on the beach. Marriage (among women) seems to be unfavourable to the arts, for we notice that nearly all the names in the list at the end of the catalogue have "Miss" before them, the married names being almost nowhere—we only counted ten in the whole list extending over nine pages. Marriage, we suppose, takes a lady from the studio to the nursery.

Messrs. Dickinson's Gallery. MISS PEACHEY'S oil sketches in Brittany, at Messrs. Dickinson's Gallery in Bond-street, show much feeling for landscape effect; and one or two sketches of winter snows in the Engadine are interesting as showing an aspect of that region with which most of us are not familiar. The character of country is well given, too, in such sketches as "Ile de Batz" and "La Forêt, from Concarneau"; and in the vigorous sketch of "Threshing with Flails" there is a reminder of the energy of Millet in subjects of this class. A series of studies of animals by Miss Gertrude Whelpton form part of the same exhibition. These also are of no little merit; "The Yeoman's Horse" is a capital study, showing very good drawing, and the studies of cats, especially the one "Left Behind," are worth attention.

The Dutch Gallery. AT Mr. Wisseling's Dutch Gallery, which has now migrated, apparently, from 14, Brook-street to 14, Grafton-street there is an un-catalogued collection containing some very good pictures; notably one of the finest examples of J. Maris that we have seen; one or two good examples of Vollen, and a very fine coast scene by Mesdag.

Pictures of Norway. THE title of "Norway" appended to the collection of water-colour drawings by Mr. Jungmann which are on view at Messrs. Dowdeswell's, suggests something very different from what the visitor will find. These are not drawings of the grand scenery of Norway, but what may be called details of the country and its inhabitants. As far as the figures are concerned, Mr. Jungmann's decorative style comes in very well; much of the interest of the figures lies in the picturesque costume, and this is treated by the artist in a painstaking and effective manner which produces pictures a little stiff, it is true, but admirably decorative. But it is a different thing with the scenes (we say purposely "scenes" rather than "scenery"). The villages with their naive timber architecture are painted in a way that shows the facts carefully,

but fails to make a picture. The structure and appearance of the buildings are most carefully given—you might almost write a specification of them. But they do not blend with the scene the least; it is not a picture but a diagram.

EXHIBITION OF ACADEMY STUDENTS' WORK.

THE Travelling Studentship in Architecture has only attracted three competitors. The subject was "An Art School for a London Borough," and it has been won by Mr. Leslie Wilkinson, whose design is certainly the best of the three, but not one to excite much enthusiasm. In the plan the three departments of Antique and Life, Painting, and Architecture, are on three sides of the building and all lighted at the side, with the consequence that they cannot all have an equally good light; south is avoided, but the architecture school has west light, which is a bad one in summer. Otherwise the plan is well arranged, and the elevation fairly pleasing but rather wanting in refinement, and the shape given to the gables of the end pavilions—a wall cut out into an overhanging curve on each side, is a detail that is quite out of scale with its position and surroundings. In an Academy drawing somewhat more care should be required in putting in the sculpture on the building; the sketching of figures with balloon-like curves of drapery is a little too easy a way of doing it. In the design numbered 166 the author has done worse with the lighting, for he has given the architectural classroom a side-light to the south—an aspect, in summer, almost intolerable for working.

Only one design has been submitted for the prize for an elevation treated in colour (the east end of a church); the silver medal has been awarded to the one competitor, Mr. W. Harvey, whose colour harmony in the composition is very good, though it seems rather ragged in detail.

Five students have competed for the Architectural drawing prize, the subject being the Rood screen of the Church of St. John, Bois-le-duc. A first silver medal is awarded to Mr. Swarbrick, and a second to Mr. W. Harvey. There is not really much to choose in merit between the two, only that the former being tinted, and the latter only in line, the former is the more effective. The careful drawing of the figures and other details in these two sets is proved by their great similarity. As an example of the aberrations which will occur in what profess to be careful drawings from the actual work, it was rather amusing to compare the left hand sculptured figure on the upper part of the screen as shown in the two prize drawings, with the same figure as shown in the sets numbered 171 and 172; it was impossible to suppose that they were meant for the same thing; both attitude and proportion being completely different in each, both from each other and from the prize drawings.

For the prize for perspective drawing for architectural students only one competitor appeared, Mr. Leslie Wilkinson, and to him the prize has been awarded for a good drawing of the interior of St. James's Church, Piccadilly, accompanied by a drawing showing the construction lines of the perspective.

In the upper school of architecture the 25th prize for a set of drawings of an architectural design is awarded to Mr. Percy I. Elton for a set of drawings of a Chapter house. This is a pure Gothic study, on an octagonal plan. The large-scale half section is a very good drawing. Among the others that numbered 177 was a good and rather original study. In the lower school the 15th prize is awarded to Mr. Bayley for a set of drawings of "A Livery Court Hall for a small city." This is the best thing among the architectural drawings; a good plan with a suitable and satisfactory architectural treatment. The 10th prize was awarded to Mr. Leslie Wilkinson for designs for a college hall, late Gothic in character.

The subject given for a sketch for a figure picture was "Cain Killing Abel." The subject, only demanding two figures, is simpler and easier than many that have been set, but the results are not very promising. Mr. E. G. Solomon obtained the prize for what is perhaps the best design, though we were rather struck with one representing Cain standing in remorse

and terror over the dead body of Abel, with a stormy sky behind. It may, however, have been considered that this did not strictly carry out the subject.

Sculpture, as usual, shapes best among the exhibits. The subject for the model of a design was "Samson and Delilah," and the prize-winner, Mr. Merrifield, has produced a model which is full of promise, as it is both expressive and truly sculptural in line and building up. Delilah is seated with Samson kneeling and bowed over her knees in sleep, white shie, with a cruel expression of face, beckons to his enemies. The group is concentrated and pyramidal in composition, and altogether of great merit; it would be well worth execution on a life-size scale. The second prize model, by Mr. Sands, is also good in line, but much more commonplace in conception. The sets of models from the life show very good work. For the Figure and Ornament prize—subject, "A frieze for a temple of Neptune," the prize was won by Mr. G. Alexander for a bas-relief composition in which nude children, fish, and a sea-angel, are combined in a very decorative manner. It was unquestionably the best of the three or four designs sent in, but there was merit in No. 154, a conventional frieze of sea-horses and riders, of a very architectural character.

The Creswick prize—subject, "Scotch firs on a Common," attracted far more competitors than anything else except the sculpture model; though, as usual, few or perhaps none of the works could really be accepted as satisfactory specimens of landscape-painting. Miss Walford's, which obtained the prize, is undoubtedly the best in execution, though less effective in composition than some others. The tall fir-tree stens shut in the view—they look rather too flat and seem to want modelling a little; the sky, the best portion of the picture, shows through their foliage; the foreground is rather weak in effect and harsh in its green. Among the others Nos. 7 and 16 were above the average. The exhibition of these pictures serves to indicate (if the indication were required) how very difficult an art landscape-painting in oil really is, when we see that so many students who are not mere beginners, who have learned to handle the brush with ability, cannot among them produce what can be called a really complete work of art. To represent a scene is one thing; to treat it so that it becomes a work of art in landscape is another and a rare accomplishment.

The subject for the Cartoon of a Draped figure was a difficult one—"A Greek girl dancing," involving the expression of action as well as mere pose and design. It is probably for this reason that the set are not so good as we have seen in some former years. The prize drawing, by Miss Lilian Price-Edwards, is very pretty, but not very Greek; there is too modern a feeling and expression about it; something that may be described as *espèglerie*, a quality distinctly not Greek.

For the prize for perspective open to all students there were but two competitors; if students only realised how often even eminent painters fail in the perspective of buildings, they would see the advisability of giving more attention to this subject. The prize is won by a lady, Miss Dovaston, with satisfactory drawings.

The subject of the Decorative painting for the wall of a public room was "Peace," and the prize has been awarded to Mr. G. H. Short for a design which is certainly the best, and is a very able and original one, but which may be open to the objection that it is scarcely a real rendering of the subject. It represents the globe of the earth revolved in space, beneath the stars, by two flying nude figures, who seem to turn it round; an inscription round the margin, in rather cryptic characters, among which were to be made out the words "Seed-time and Harvest, Summer and Winter shall not fail," indicates that the idea in the author's mind was that of the promise after the Flood; but it is a somewhat too fanciful reading of the subject given. However, it is good both in colour and design, and distinctly decorative in character, and the life-size cartoon of one of the figures is a very clever drawing. Among the others perhaps the most successful was No. 31, in which two old people, picturesquely designed, are seated on a stone bench on the right of the composition, looking at the setting sun; there is poetry in this, as well as good composition, though a little too much of landscape effect for a decorative picture. No. 30

was good in colour, but the figures rather commonplace; No. 24 also good in colour. In No. 23 the seated draped figure on the top of the arch is well posed and comes out well in the life-size cartoon; the composition rather wanted definite line.

MAGAZINES AND REVIEWS.

THE *Art Journal* opens with an article by Mr. F. Maclean on a rather new subject, "Positions and accessories in portraiture." The illustrations selected remind one how great a change in taste in these matters has taken place during the last hundred or hundred-and-fifty years. It would hardly be possible to paint a portrait of a child nowadays, as Reynolds painted Master Wynn, "in the character of St. John," attended by a lamb, and holding a cup to catch water from a spring streaming from a rock. Nor do we see ladies now painted as muses and what-not-else of allegorical characters. There is a feeling that this kind of treatment is in a false and pretentious taste. The author notes also that in portraits of naval and military heroes it is no longer usual to represent them wielding a sword or pointing a telescope in the thick of battle, with a cloud of smoke as a background; though such portraits are generally painted in the uniform of the profession. Mr. Maclean thinks that we "have lost some of our inventiveness" in portraiture; but the inventiveness of the old school was hardly of the right kind; there was something of the mock-heroic about it. There is something to be said for introducing into the portrait of a man celebrated for any special professional acquirement some indication of his work; a good example is Millais' remarkable portrait of Sir James Paget, lecturing on anatomy before a blackboard with chalk sketches on it. We do not know whether the writer means to continue the subject; it is by no means exhausted in this article. Sir W. Richmond's remarkable Gladstone monument forms the subject of two illustrations, photographed from the plaster model, now complete. This will be a fine and very original example of monumental design when completed. Calvert, Blake's friend, and a somewhat kindred spirit in art, is the subject of a short article accompanied by two illustrations, and one of the separate plates is a successful and powerful reproduction in colour of the "Autumn" of Mrs. Stanhope Forbes, whose work is the subject of another article.

In the *Burlington Magazine* is a short editorial note on "The picture exhibitions of the future," in which we are exhorted to scorn the large exhibitions, which are only to catch the shillings of the populace, and find more intellectual interest in small exhibitions such as that recently seen at the Leicester Galleries of the work of Mr. Conder and Mr. Rothenstein. These kind of exhibitions of eccentricities, with bad drawing of figures, or no drawing, are now the higher art! It is an amusing though somewhat irritating phase of contemporary art-criticism. Select exhibitions of the work of one man are often of the highest interest, when he is really an artist who is at the centre of things and not making eccentric side-shows out of the art of painting. That there is much in the larger exhibitions only calculated for the popular mind is true enough; but we have the chance of a great picture or two in them, worth more in itself than scores of would-be intellectual eccentricities. An article on the late Mr. Forbes's Millet drawings is accompanied by a number of very interesting illustrations, all of course of Millet's peasant-painting era, which has now obscured to most people all recollection of his earlier and equally powerful paintings of abstract and nude subjects. Millet opened a new chapter in modern painting in his treatment of peasant life, but it will some day be recognised that the artistic element in these has been somewhat over-rated—that many of them are not so much pictures as moral lessons. Mr. Clouston's essay on "Minor English Furniture Makers of the XVIIIth Century" deals in this issue with the work of Matthias Lock, whose style, as Mr. Clouston says, is essentially that of Adam and his drawings very like those of the eminent architect. The design for the table and mirror reproduced from one of his drawings we cannot admire except in regard to the treatment of the mirror frame and its method of connection with the accessory ornament; but this latter, and the design of the table legs, are very bad, and better forgotten than preserved in the illustration.

Lock's sketch of a one-armed oval chair, with no tawdry ornament, is good; it was the ornament that led these people astray. The number includes two fine illustrations of a beautiful bronze Hermes, one of the Parameythia set, lately presented to the British Museum by Mrs. Hawkins, with a historical and critical note on it by Mr. Cecil Smith.

The illustrations in the *Berliner Architekturwelt* are devoted mainly to a single house, No. 38 Benderstrasse, Berlin, by MM. Hart & Lesser, which are very interesting. Almost the whole of the interiors of the house are given; and though there are touches here and there of that taste for twists and curves which is so prevalent in modern German work, on the whole they give a very favourable idea of a first-class Berlin street house. The exterior is treated soberly but not ineffectively; the walls are broken into vertical pilaster-like strips between which the windows are grouped. The plan is of some interest, especially in the grouping and arrangement of the bedroom floor, with its suite for the owners and suite for guests, each shut off within itself.

The *Architektonische Rundschau* contains an article on the interesting subject of "Friedhofskunst"—literally "churchyard art"; the works illustrated, however, are what may be called "mausolea," family vaults treated architecturally; a kind of architecture to which the Germans, as everyone knows, pay much attention, and which their architects often treat in an original and impressive manner. Most of the illustrations given are (naturally) German examples, but there are four of American origin. That there are no English examples need not surprise us; English architects have not done much in this way; but we should certainly have thought that French examples, which are numerous and often good, might have found a place in the article. Among the plates is a photographic reproduction of a warehouse in the Kosenenthalstrasse, Berlin, by Herr Alfred Messel, perfectly awful in its detail, though undeniably clever in what may be called its putting together. The only other illustration worth special mention is a successful colour-print of a good water-colour sketch by Herr Weigle (Stuttgart) of part of the castle of Reifenstein, near Sterzing.

Among the serial articles in this month's number of *Technics*, we need only notice those of special interest to our readers. Mr. Parshall and Mr. Hobart, continuing the subject of "The Mechanics of Heavy Electric Traction," refer briefly to the varying conditions associated with the use of several types of motor, and with the varying characteristics of motors of individual classes. They next give two series of speed-time and speed-distance curves which, considered in conjunction with curves reproduced in previous articles, show that the influence of accelerating conditions diminishes steadily with the increase of distance between stops, and with the reduction of the average speed for a given distance between stops. The charts in question should enable the student to draw many useful conclusions. Two other sets of curves near the end of the article show clearly the great increase in schedule speed rendered practicable by electric traction in short distance runs. Professor J. A. Fleming, as a part of the general subject of "Electric Waves," discusses the nature of the electrical phenomena which, owing to their similarity to those evidenced in acoustic resonance, are said to be due to *electric resonance*. The principles of resonance are admirably elucidated by several illustrations, and an interesting part of the article is that in which the writer explains the connexion of resonance with the Hertzian wave or wireless system of telegraphy. Proceeding a step further in his explanation of "The Electro-Magnetic Theory," Mr. Edser explains how quantitative information may be obtained as to the properties of electric tubes of force, the results applying with small modification to the magnetic tubes. In the ensuing investigation the writer deduces by most simple means several formulae of great importance in electrical engineering. A most useful contribution to the series on the "Theory of Structural Design," by Mr. Etehell, relates chiefly to brackets on steel stanchions, which cause bending stresses so far in excess of the direct compression that the ordinary column formula become quite valueless. The procedure recommended by the writer of the article is to compute the extreme fibre stress (f_b) due to bending by the non-axial load, and adding this to the direct compressive stress

(f) due to axial load, to design the stanchion by an ordinary column formula to carry an equivalent central load of $(\frac{1}{4} + f_2)$. A tons, where A equals area of the stanchion in square inches. A further simplification of radius of gyration formula, and some remarks on the effect of heat on the strength of steelwork are useful features to this instalment. In view of the generally admitted opinion that chemistry should form an important part of the scientific training both of the engineer and of the architect, the article by Professor Travers on "The Determination of Relative Atomic Masses" should be of interest to many of our readers. An article on "The Elements of Chemical Engineering," by Dr. Grossman, is the first of a new series intended to make clear the nature of the apparatus necessary for the economical manufacture of products which the student is taught to make on a small and generally expensive scale in the laboratory. Mr. Percy Longmuir contributes the first of what promises to be a most interesting serial article upon "The Metallurgy of Steel." The present contribution is illustrated by several views showing the micro-structure of iron and steel as cast and after heat and mechanical treatment, the differences exhibited being very strikingly presented. Finally, we may mention a description by M. Jacques Boyer, of "The International Bureau of Metric Standards," an institution under the management of an International Committee, armed with authority by the General Conference on Weights and Measures. Altogether, it will be seen that this issue of *Technica* is fully up to the standard set in former months.

The *World's Work* publishes an article on "Bungalows for people of moderate means," some of the illustrations to which show good points in planning. The editor should require those who furnish or lend plans to see that a north point indicator is put on them all; some have it, some have not.

Knowledge contains an article on the newly-discovered ninth satellite of Saturn, together with some suggested explanation of the remarkable fact, not certified till after about a year's observation, that its motion in its orbit is retrograde, or contrary to that of the planet's revolution.

In *Macmillan* is a short but thoughtful article by Mr. E. M. Congreve on "Nature in Greek Art." His question is whether the Greek really cared for and appreciated natural scenery; his conclusion is that he did, but that in art (and almost in imagination) "he was ever ready to see it in a personal form, to give a history to every hill or stream, bird or star." This is the same idea that was long ago expressed in a fine passage in the fourth book of Wordsworth's "Excursion"—the passage (too long to quote) commencing—

"Once more to distant ages of the world
Let us revert."

The *Pall Mall Magazine* contains a symposium on the subject "Is London growing more beautiful?" in which the speakers are Mr. Thackeray Ritchie, Mr. John Davidson, Mr. Boughton, Mr. R. Blomfield, Mr. Marriott Watson, and the Rev. R. J. Campbell. The title of symposium given to this kind of joint article by various authors is rather a misnomer, as a symposium should be an interchange of ideas, not a mere succession of unrelated opinions. We do not think any of the remarks come to very much practically except one of Mr. Blomfield's, who doubts whether London is improving, but thinks the failure is due not so much to want of buildings that are individually good as to the inadequacy of "the municipal idea of architecture."

"In London, for instance, in the last twenty years, there has been the failure of Shaftesbury Avenue, with its inadequate roadway and unconscionable vista. Then there was the Strand improvement scheme, in which the final setting out was determined in the teeth of competent advice so far as architecture was concerned, and a competition was held which ended in space. There is indeed the monumental Gaiety block; but who is to maintain that heroic scale? and indeed there are signs in the neighbourhood that it will be ignored at the first opportunity. And here we come back to the more particular point—there are the public parks and spaces laid out in the last twenty years. Complacent county councillors may pat each other on the back, and protest to their constituents: 'See, this we have done for you,' but to the mere artist few things are more depressing, even more irritating, than the deplorable vulgarities of recent public parks, where the eye is eternally met by the same trivial paths, meaningless planting, and trade-catalogue ornament. As to the moral side of their work, no doubt, the London County Council might make out an excellent case; but in their aesthetic aspect their failure is absolute."

With every word of which we agree.

In *Scribner*, under "The Field of Art," Mr. Russel Sturgis has something to say about the new bronze doors of the Boston Library, of which we think we have already mentioned a description and illustrations in another American magazine. Each of the six doors (hung in pairs) contains a low-relief model of a symbolical draped figure large enough to occupy most of the surface of the door, and in a relief which, in comparison with the width of the door, is proportionally no greater than the relief head on an ordinary coin. That is no doubt the right way to treat such work. The illustrations are very small, but convey an impression that the design of the figures is very graceful and pleasing. The manner in which the best art that could be obtained has been expended on the Boston library should be a lesson to public institutions and corporations in England.

The *Century* contains an article by Mr. G. H. Grosvenor on Dr. G. T. Moore's method of purifying water from typhoid germs by dissolving a small proportion of copper sulphate crystals in it. This is a method applied not to the family cistern so much as to reservoirs, etc., on a large scale, the method being to tow coarse sacks full of the crystals, slung from boats, across and across through the water. The success of the experiment on several fouled reservoirs is described in the article, the proportion of the copper sufficient to destroy the algae being too small to affect the drinkers of the water. The article is at all events of considerable interest, and goes fully into the subject.

"London Films" is the title of an article in *Harper* by Mr. W. D. Howells, the well-known American novelist, which is really a record of his impressions of London city and London Society. It is, as may be supposed, cleverly written, and in regard both to City and Society recognises very candidly that London has desirable elements which New York has not—for it is between London and New York that the comparison is especially made. One reason Mr. Howells prefers the effect of London to New York is in the unbroken line which our streets present, while in New York the horizontal line is checked and interrupted constantly by the vertical lines of the high tower buildings. We learn, therefore, that all Americans, at any rate of the most cultured class, do not think the high building such a blessing.

The *Revue Générale* has an article on the subject of the legend of St. Francis as treated in early Italian art, by M. Arnold Goffin, whose articles on artistic subjects in this excellent review we have often alluded to. He remarks that it is only among the "Primitifs" that the Franciscan legend is treated with the simplicity and spirituality which its illustration in art demands; the painters of a later age get too far removed from the spirit of the legend.

In the *Gentleman's Magazine*, under the title "Mother Moscow" (a familiar Russian appellation of the ancient city) Miss Emily Richings writes a picturesque description of the city, its principal buildings and the general impression it gives to the eye of a visitor.

THE ACROPOLIS OF ATHENS.

On Saturday last at the British Museum Professor E. A. Gardner, M.A., lectured before the members of the University Extension Guild on "The Acropolis of Athens." The lecturer's remarks were illustrated by drawings. Commencing with an outline drawing of the hill, he placed in position representations of the buildings as he described them. In the course of his address Professor Gardner said that there were only two places in the world where one could properly study the Acropolis—one, of course, was on the site itself, and the other was the Elgin Room in the British Museum. He wished that day to bring before them the various stages by which the Acropolis of Athens became that wonderful harmony of buildings and walls which was so familiar to them. The Acropolis of Athens was not always so distinctive in its shape, and so different from all other sacred citadels as it was now. In early days it was simply a rock of somewhat irregular shape standing at a considerable height above the surrounding country, and which must always have been conspicuous in the Athenian landscape. It was situated at a convenient distance from the sea, which was a great consideration in early days, when the inhabitants were likely to be attacked by pirates. It was fortified with a massive wall, of which some traces might still be seen. The only accessible side was the western, but on the northern side there

was a staircase which was a kind of postern similar to those in the citadels of Tiryns and Mycenae. There was one other means of access, which was the tunnel and cave which was used by the Persians to capture the Acropolis at a later date. They had not much trace of the early gate of the Acropolis, but they had remains of a great flanking tower. It was situated on the right, so that any one approaching the defenders could be assailed. There were some traces of a zig-zag path on the western side. They could also trace the walls and towers at intervals of this ancient citadel. They had little in the way of architectural form up to this, for the walls followed the contour of the rock. The first change to more architectural form was the temple, which Homer told them expressly was the favourite abode of Athena. They were told how Athena set Erechtheus in her rich temple. The form was much like that of later temples. They did not know by whom the temple was built, but it was of very early date, and probably went back some time before the Tyranny of Athens, in the Vith century. Pisistratus, somewhere about 550 B.C., seemed to have thought the temple was too plain for the goddess, and placed columns around it. It was a colonnade of the Doric order, but by no means the earliest type of Doric. In this state, probably, things remained during the time of the Tyranny, although no doubt, of course, smaller buildings were erected which had disappeared. Some were destroyed by the Persians, but although they had many fragments they could not with certainty restore the plans and say exactly where they stood in the Acropolis. At this time the Acropolis was still a fortress, and things remained so up to the revival of the Athenian Democracy, in 510 B.C., when the principal gates were broken down so that there should be no temptation for any powerful citizen to seize the fortress. It was probable that about this time the idea arose of building a temple for the great Athenian goddess, but to enable this to be done on the highest point it was necessary to make a structure to carry the temple. The great temple was raised upon a substructure of extremely massive character, built entirely of stone quarried from the neighbourhood. Many books said this temple was not projected until after the Persian wars in 480 B.C., but he thought it was extremely probable that the original project was twenty or thirty years earlier. It was also probable that the first intention was not to make such a magnificent temple as the Parthenon. They could recover the walls of the substructure deep beneath the earth, and this building no doubt went on during the earlier days of the Athenian Democracy. After the battle of Marathon, 490 B.C., it was apparently decided to make the temple more magnificent than was at first intended, and instead of building it of limestone to build it of Pentelic marble. At the same time probably the entrance of the Acropolis was taken in hand. A kind of marble hall was placed at the entrance, and a facing of marble was given to the wall there, including the bastion which protected the gates in earlier times. The temple he had referred to was being built when the great event came; the victory of Marathon in 490 B.C. had only deferred the victory of the Persians for ten years, and in 480 B.C. the Persians invaded Greece. The Athenians had been warned by the God of Delphi to seek shelter behind wooden walls, and most of them took to their ships. A few waited at the Acropolis, and paid heed to the oracle by building a wooden barricade. For a long time the Persians could not get in, but at last through treachery they got into the citadel by means of the cleft and tunnel he had referred to, and, taking the defenders in the rear, slew them. The Persians burned down all they could, and threw down the buildings. They set fire to the scaffolding round the temple, and damaged severely the marble drums, which were in position. When the Athenians returned after defeating the Persians at sea they found their temples thrown down or burned. The sacred olive tree, which stood outside the House of Erechtheus, was burned too, but they were told by Herodotus that a long shoot the next day was seen to grow out of it. Themistocles fortified the north side, and into the walls built a great deal of the materials used in the temples pulled down by the Persians. The place was left pretty much as it was till 483 B.C., when Cimon, who had accumulated a great deal of spoil, proceeded to build the magnificent wall of the Acropolis on the south. In

this he departed from the practice of his predecessors, and made a magnificent sweeping wall, which gave an entirely new character to the hill, and made it as we see it at the present time. It was the great wall of Cimon which gave the Acropolis its regular aspect. Another thing he did was to erect the colossal statue of bronze which stood in the open air facing the old gate house, and which was the most conspicuous thing to be seen as one approached from the sea. Then they came to the age of Pericles, who devoted the treasures which had been gathered together for the protection of the Greeks against the Persians to the decoration of the Acropolis in such a manner as to embody in it for all time all that was most perfect in Greek architecture. They could trace from different records the stages of the work, and the earliest building was the little temple of Niké Apteros, or the Wingless Victory, which stood on the bastion on the west wall. His next great project was to build that temple which they knew now as the Parthenon, and this was built on the sub-structure which he had dealt with. It was, however, somewhat different from the plan originally decided on in the building which was commenced before the Persian invasion, and was made broader and somewhat shorter. He need say nothing of the Parthenon, but it was the temple from which the bulk of the sculpture in the Elgin room came, and was the second of the Greek works carried out by Pericles. Another great undertaking was to replace the earlier and somewhat antiquated marble hall at the entrance by the Propylæa, which still remained to a large extent *in situ* at Athens. The plan of this building was originally a very magnificent one, but to have carried it out would have meant interfering with revered objects of worship, and so the southern wing was finished off in a curious way, and certainly not in the way the architect would have liked. There was great opposition on the part of the more religious and conservative Athenians to the interference with sacred objects, and the plan had to be given up, but there was no doubt that the architect would never have consented to have had his plans mutilated, but that he felt he would in time overcome the opposition, and be able to carry out his original plans. Another of the great buildings of the Acropolis which might possibly have been begun under Pericles, but which some authorities said was not begun until later, was the Erechtheion, and this was doubtless intended to take the place of the early temple of Athena and Erechtheus. In some ways, of course, the Parthenon took the place of this ancient temple, but the Athenians never allowed it to take chief place in the worship of the goddess. The sacred image was kept in the older temporarily restored building, as well as many other sacred objects, which may have been in other temples prior to the Persian invasion. The plan of the Erechtheion was unique, and doubtless was planned in the way it was to include various sacred objects, such as the imprint of Poseidon's trident. It was very probable that the first plan of this temple was modified, and in all possibility after it was built the ancient temple of Athena was removed. The Erechtheion was built in the Ionic style, and the Porch of the Caryatides was still in a state of preservation. A building which they could not date, but which was probably of the late Vth or early IVth century, was placed on the south wall—the Chalcotheke, a great storehouse for bronzes. It was at a lower level than the Parthenon, and did not interfere perceptibly with the view of the Temple. The Acropolis remained in this state during the IVth century, except that, of course, numerous statues were erected. It was not, however, until Roman times that any other monuments of any importance were erected. In the time of Augustus there was set up in front of the entrance a pedestal, which carried the statue of Agrippa, and which formed the most conspicuous object then to anyone approaching the Acropolis. The last of the buildings was the little temple set up in front of the Parthenon, dedicated to Rome and Augustus. It was built by the architect who probably restored the Erechtheion, and it marked work of the Vth century. While it was good work, yet it could not stand any comparison with the earlier work of the Greek architects.

Professor Gardner, at the conclusion of his lecture, accompanied the members of the Guild in a tour of inspection of the Elgin statues.

PROPOSED EXCAVATIONS AT HERCULANEUM.

At the Royal Academy of Arts on Tuesday, Dr. Charles Waldstein (Slade Professor of Fine Art in the University of Cambridge) gave a lecture on "Herculaneum and the Proposed International Excavations." Sir E. J. Poynter presided.

The Chairman said he wished to state briefly what had led to the meeting. It might be a matter of surprise that the excavation of the city of Herculaneum, which led to such wonderful discoveries of antiquity and art more than a century ago, should for so many years have been suspended. The general explanation given by those who had no intimate knowledge of the facts was that Herculaneum was overwhelmed with a stream of lava which was a material it was impossible to deal with. They might be sure that there was no want of enterprise on the part of those engaged in the work of exploring the buried cities of the Bay of Naples, but there were peculiar difficulties in pursuing the work of investigation. Those difficulties, however, were not insurmountable, and resolved themselves rather into a matter of expense. The excavation of Pompeii had gone on steadily with few interruptions since they were first started in 1755. The problem there was comparatively simple. The town was covered under an accumulation of fine ash from the volcano, but the roofs of the buildings were not completely covered, and the soil to this day was loose and friable and easy to remove. Herculaneum, on the other hand, was overwhelmed by a sea of mud, and the labour and cost of clearing it away was so great that the opening of the remains to the light of day had always been considered to be out of the question, and tunnelling appeared to be the only method of reaching the buildings; the most serious difficulty however was the existence of Portici and Resina over the ancient city, and the attempt to excavate in 1860 was abandoned, and there had been no further serious efforts made to discover the treasures which were buried underneath. As they knew, by far the largest portion of the Greek art in the Naples Museum was found in Herculaneum, and much remained to be discovered. It would be a sort of miracle if the first house that was excavated should be found to be the only one of any value. Dr. Waldstein had conceived the idea of making further excavations of this ancient city an international enterprise. He had met with much success, but his idea was that the scheme should take definite shape in England. Under those circumstances it appeared to him (the speaker) that these discoveries being an artistic matter, the Royal Academy of Arts was the proper place from which the scheme should take its inception. The Council of the Academy took up the suggestion warily, and the invitations for that meeting were issued. He had the assurance that the Italian Government was deeply interested in the matter, and, of course, without the consent and approval of Italy it would be an impertinence for foreign nations to step in.

Dr. Waldstein said he must first thank the Council and Fellows of the Royal Academy for allowing him to promulgate his scheme. It was most appropriate that of all archaeological excavations on concerning the ancient Herculaneum should, as a scheme, take its inception in that hall. The proposed excavations would, no doubt, have an immediate bearing on problems of history and on archaeological questions, but there was equally no doubt that they would be directly concerned with things of beauty and works of art. As they knew, Vesuvius had remained quiescent for many centuries, and the inhabitants of the Campanian district were in no way led to expect an eruption before it came. It was true there was a great earthquake in 63 A.D., which was only sixteen years before the final eruption, and this destroyed a part of Pompeii, and no doubt a portion of Herculaneum; but in the intervening sixteen years the part destroyed was rebuilt. It was on August 24, 79 A.D., that at half-past one in the afternoon a great volume of smoke issued from Vesuvius, and in Sir R. Jebb's translation of the letters of Pliny the Younger to Tacitus they had the whole scene described in vivid language. What was important to them and always to be borne in mind was that the effect of the eruption was very different upon Pompeii and Herculaneum. The wind, as was described in the letters of Pliny, came from the north-

west, and this blew the ashes to the south-east and south. Pompeii and Stabia were covered with hot ashes and pumice-stone, while a great stream of fluid mud poured down from the mountain and covered Herculaneum and the whole district around. It was so plastic that it entered every crevice, and this had preserved instead of destroying. It had been shown by the investigations of geologists that there was no trace of lava, and it was curious how widespread was this misapprehension. Nearly everyone said, "I know that excavations are impossible because you have hard, impenetrable lava." He had tried to find who was the first authority for such a statement, but had failed. He, in company with Mr. Shoo-bridge and experts, had examined the site, and they found no trace of lava. Professor Hughes, of Cambridge, Guy Lussac, and other eminent geologists had all distinctly stated that it was hardened mud and ashes with bits of stone mixed up, and this had hardened where it was exposed to the air, but it was perfectly friable and workable. Moreover, it was proved by the excavations which had been made; and it seemed to him strange that, in the light of the wonderful works found, and the marvellous state of preservation in which they were found, which filled the Museum of Naples, excavation had not been made, for the finds taught an interesting lesson with regard to the state of preservation of articles found in the two cities. In Pompeii the bronzes were a good deal destroyed, the wood was burned, the marble calcined, and the glass molten; but in Herculaneum they did not find this. There they found the bronze with beautiful patterns remaining, and manuscripts had been found which could be read. Pompeii was situated on an eminence and was never completely covered, and there was evidence that the inhabitants returned and searched for their lost treasure. On the other hand, Herculaneum was at once and completely covered with a mass of liquid mud to the height of 80 ft. in parts. It was completely obliterated; the catastrophe was sudden and overwhelming, and while he did not wish to be wanting in sympathy and compassion for the poor people who perished, yet he must confess it was so long ago that he had a feeling of joy, so far as the remains they hoped to find were concerned, that it was a wonderful preservation and not a destruction. At the height of the life of this glorious town life was arrested and fixed for centuries, and it remained for them to restore that life again to at least an artistic vitality. There was a great difference between Pompeii and Herculaneum. It was true that the whole district was settled by Pelasgians and Oscans, but Pompeii was of more Oscean origin, while Herculaneum was a Greek settlement. No doubt Herculaneum was affected by the Samnite war, but although the Samnites overran the country Greek culture prevailed and survived. Then the Samnites who had settled in the plains were overcome by the more hardy Samnites from the mountains, and it was not until the social war between 90 and 80 B.C., that Pompeii and Herculaneum became Roman towns. Herculaneum, however, always remained Greek, and they found that the Greek artisans who worked in Pompeii lived in Herculaneum. Pompeii was, after all, a town of pure mercantile interest, whereas Herculaneum was a centre of the higher intellectual life, where people congregated and had their villas. One fact alone would bear that out. At Pompeii they could not say that a single manuscript had been found, whereas in the one villa excavated at Herculaneum 750 papyri were found. The only bits of writing they had in Pompeii were a few interesting wax tablets, but these merely contained receipts for auctions. Then again at Herculaneum the works of art were of the finest character, representing the highest phase of Greek taste, but few came from Pompeii. Unfortunately the literature which had been found in the Villa Piso was that of an abnormal being like himself—the literature of a specialist, who was devoted to Epicurus. The whole of the 750 manuscripts concerned Epicurean philosophies. But the others who lived in Herculaneum could not have been specialists, and it made them giddy to think of what they might discover—the lost books of Livy, the whole of Aristotle, and lost Greek tragedies. One villa at Herculaneum had yielded as many works of Greek art as the whole of Athens, if the Parthenon was excluded. Although he did not claim for Herculaneum that it was one

of the greatest centres of civilisation, still there ancient Greek art was kept alive, and it was the only centre where they had any reason to go for a more or less complete restoration of ancient life at its height. Dr. Waldstein at this point exhibited a large number of lantern slides, showing the bronzes, statues, papyri, ornaments and domestic articles found at the Villa. Piso, and said he brought these to show the state of preservation of the objects, and what culture and civilisation the inhabitants of Herculaneum were possessed of. In 1738 the first excavations were begun under Royal authority, but the work was unsystematic, and in 1750 to 1760 the villa of Piso was excavated. Piso was supposed to be the father-in-law of Casar, and the opponent of Cicero. The discovery made a great stir in Europe, and in 1800 the Prince of Wales, afterwards George IV., undertook to have the papyri deciphered. From 1828 to 1837, and from 1869 to 1875, excavations were carried on, but since 1875 they had been completely stopped. The reason was because of the expense, and because the town of Resina was above, but the British Consul at Naples had promised to inform him of the cost of property, and said that work for many years to come could be carried on without touching any house property of any value. The cost was such that Italy could not afford it, but they ought to be very grateful to Italy for what she had done. The work would be so expensive that he did not think any one nation could do it. It had been his dream to see it done, and the scheme was very simple. It was that the committees should be established in any country having claim to civilisation, to collect funds, and above all there would be an international committee, with, he hoped, the King of Italy at the head. This committee would be trustees of the funds, and communicate with the local committees with regard to the international staff which was to work the site. Last spring they succeeded in gaining the enthusiastic support of the King of Italy and of the Prime Minister. King Edward had expressed himself as deeply interested, and Secretary Hay had written stating that the President of the United States was taking the keenest interest in it, and would put himself at the head of the American Committee. In France, President Loubet had given his consent, and in Germany the Emperor had shown vigorous interest. In Vienna a strong committee had been formed, and the King of Sweden was interesting himself in the matter. The following day he was going to America and on his return he hoped they would be able to form the committee in England.

LONDON TOPOGRAPHICAL SOCIETY.

The sixth annual meeting of this Society was held in the rooms of the Society of Antiquaries, Burlington House, on Tuesday, under the chairmanship of Mr. F. G. Hilton-Price (Vice-President).

Mr. B. Gomme (Secretary) read the report of the Council, which showed that a steady increase in the number of members continued, and there were now 165 members, as against 150 last year. There were 46 libraries and institutions in membership, and during the year special communications, with full information as to the publications, etc., of the Society, had been addressed to all the principal curators and librarians, both in the United States and the Colonies. The principal duty of the Council during the past year had been to arrange for the publications to be issued for the current year. Their choice fell upon Morden & Lee's map of 1677—a large map of London, Westminster, and Southwark—drawn to the scale of 3.30 ft. to the inch. They had also put in hand a reproduction of the map attributed to Ralph Agas, and probably drawn early in the reign of Queen Elizabeth. Virtue's version, founded on this map, was well known, and it might be said, without a suspicion of ingratitude, that since the reproduction made by the City Corporation some years ago the means available for work of this kind had been greatly improved. It was a pleasure for the Council to report that the City authorities had promised every facility of access to the rare original copy of the map in the Guildhall Library, while the master of Magdalene College, Cambridge, had been equally obliging in respect of the original copy, which was one of the treasures of the Pepsian Library in the College. These two copies varied in this respect, that age and use had affected them differently—portions which

had faded or become worn in the one being in a good state in the other. The distinction of the Society's facsimile would be that it would combine the best parts of each, thus effecting a restoration of the map nearly approximately to its original appearance. With the second volume of the "London Topographical Record," issued during the year, the Council were able to distribute the copies of the book entitled "Signs of Old Lombard-street," which the author, Mr. F. G. Hilton-Price, presented to all members of the Society. All students of London would rejoice that Mr. Hilton-Price was continuing the publication of his further collections on this interesting subject. The contribution in the second volume, dealing with the signs of Ludgate-hill, Ludgate-street, Old Bailey, Little Old Bailey, Ave Maria-lane, Creed-lane, Amen-corner, Warwick-lane, and Ivy-lane, would be continued in Vol. III., which was in preparation, and would complete the matter relating to St. Paul's Churchyard. Colonel Pridcaux was at work on the commentary on the plan of the turnpike road from Hyde-park-corner to Cooter's-bridge, which would appear in the same volume. The outline of a plan for a new edition of Stow's "Survey of London" would be contributed by the editor, and it was hoped that the volume might be enriched by further valuable papers by some of the specialists and authorities who take an interest in the Society's work. A full record of current topographical changes had not yet been realised. It was felt that if undertaken by this Society such a record must be complete, and cover the whole field. But the organisation of such a result presented so many points of practical difficulty that it might be open to question whether some such account as that given in the Society's first volume, admittedly inadequate though it was, should not be continued in default of a better. As a record of topographical changes at an earlier period the photographs taken by Mr. Win. Strudwick between 1862 and 1870, and reproduced in the last volume, had been much appreciated. What was now required was a photographic record of all that existed of Old London, which would be a source upon which they could draw for their annual volume in the future. The report also dealt with the decease of various members, including Mr. W. W. Gwyther, F.R.I.B.A., whose loss, it was stated, would be the more regretted because the Society had in its ranks too few representatives of his profession.

On the motion of Mr. T. Blashill, seconded by Lord Belhaven and Stenton, the report was adopted.

The meeting proceeded to the election of the President (Lord Rosebery), vice-presidents, council, and officers; and on the motion of Mr. Fowler, seconded by Mr. W. F. Preedy, a vote of thanks was passed to the retiring council and officers.

Mr. Hilton-Price then delivered an address dealing with the antiquities of Old London, which was illustrated by a large number of objects from the speaker's own collection. He pointed out that there was little remaining in the City of London which might be called Old London—that was what was in existence before the Great Fire of London in 1666. Not only had the substructures gone, but the foundations of the old buildings were being rapidly swept away, and therefore it was to be greatly hoped that someone was keeping a watchful eye upon all new buildings where there were excavations for the foundations. It was specially the foundations which should be watched, and the earth beneath the foundations. In the last sixty years there had been numerous changes in the City, the topography had been altered to a certain extent, and the City had been practically rebuilt. Few of the ordinary people seemed to take any interest in the clearing away of London of the past, but, judging from the many fragments of marble and other things denoting wealth and luxury which had been found from time to time, he could not help thinking that in Roman times London was a handsome city, and in mediæval times there must have been many handsome buildings; while many interesting buildings which were erected after the Great Fire had been pulled down, nearly all the old houses inhabited by bankers and merchants, and the old coaching inns, had gone, while, owing to the value attaching to the sites, a number of churches had also been demolished. In many instances whole streets had been swept away where thoroughfares required widening, and also for railway

termini. For the making of Cannon-street Station many buildings were demolished, and the same was the case in Upper and Lower Thames-street. St. Paul's-churchyard had been almost rebuilt in recent years, and outside the City they knew what had been done in the case of Clare Market, Drury-lane, and Westminster. Interesting old houses had given place to fine stately stone buildings, and to erect these buildings the builders had to clear away the old foundations right down to the virgin clay. After the Great Fire in 1666 the greater part of the new buildings were erected upon the foundations of the old buildings, and as nearly the whole City was destroyed a new city sprang into existence upon the debris of earlier times. There were before the Reformation several monasteries and religious houses dating from the XIIIth and XIVth centuries in the City, but after the Reformation they were put to more or less base uses. They were demolished by the Great Fire, and new houses were erected upon the splendid old crypts, which were afterwards used for wine vaults, cellars, and even kitchens. As a consequence of building on the debris of the past the level of the City had been raised, and a large number of antiquities had thus been preserved which would not have been the case had the present method of digging down deep for foundations been adopted. It was in the digging out for foundations that they came upon layers which belonged to different times, and at times they found the Roman layer went down a very considerable depth. It varied, however, very considerably in different parts of the City, and between Eastecheap and Threadneedle-street it varied from 15 to 26 ft. It was well for them that there had been archaeologists in the past, who had personally watched the excavations and who had in the proceedings of the Society of Antiquaries and of other bodies handed down their experience and had enriched the British Museum and the Guildhall Museum with their finds. The British Museum acquired the collection of London antiquities which belonged to Mr. Roach Smith, but the Guildhall contained the largest collection of such antiquities. The greatest collector of late years was the late James Smith, of Whitechapel. Smith was a costermonger and a scrap metal dealer, but he visited with his small cart every part of London where there were excavations going on, and he picked up an enormous number of articles. When his house became full from top to bottom he sold the whole collection. He sold one collection to the Guildhall, and he (the speaker) bought another collection, which Smith was pleased to describe as "the whole shoot." Smith could neither read nor write, but had a wonderful knowledge of antiquities, and could describe an article he had disposed of which he had not seen for years. Mr. Price proceeded to deal with a large number of articles of antiquity which had been unearthed at various periods and which are now either in public museums or private collections. In Lombard-street a Roman pavement was found 12 ft. from the surface, and at Foster-lane a pavement, glass, and pottery were found at a depth of 18 ft. Cannon-street was evidently a portion of London thickly populated by the Romans, for numerous articles were found there. At the corner of Camomile-street a pavement was found 4 ft. from the surface, while singularly enough in Lombard-street Roman pavement had been found at various levels. Fine specimens of pavement had also been found in Leadenball-street 12 ft. from the surface, Lothbury at from 11 to 12 ft., and in Threadneedle-street, Broad-street, and Bucklersbury. Most of the principal Roman buildings appeared to have been on the banks of the Wall Brook, and the course of that stream had been traced by Mr. J. Price. Many brass coins and other interesting objects had been discovered in the black mud of the Wall Brook, and they were found to be perfectly bright like gold. The Wall Brook appeared to have formed the western boundary of the first London city, and Roman cemeteries had been found in Whitechapel, Spitalfields, and the Minories. Later on the Roman city was considerably extended, as was evidenced by the discoveries at various times of pieces of the old Roman walls. Many bronze objects and statuettes had been dredged from the Thames, while a Roman pottery kiln was discovered in St. Paul's-churchyard. Just under London Bridge thousands of coins were found, and Mr. Roach Smith observed that they were dredged up in chronological series, as if they had

been deposited. It was possible that they were deposited on the building or repairing of the bridge. In conclusion, Mr. Price referred to the many interesting objects of everyday use which had been found of dates ranging from the XIIIth to the XVIIIth century.

Mr. P. Norman, in proposing a vote of thanks to Mr. Price, said the lecturer had thrown out a hint for a new departure by the Society. They had so far done valuable work in the way of making maps and giving drawings of old buildings, but perhaps even more valuable work might be done by going back earlier and helping to elucidate the problems in connexion with old Roman London. There had been so far no systematic attempt made to explore Roman London, and he felt if they could do that they would learn as much about it as they knew of Silchester.

Mr. F. Ordish seconded the motion, which was carried.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

A MEETING of the Civil and Mechanical Engineers' Society was held at the Caxton Hall, Westminster, on Friday, December 9, when Mr. H. E. Bellamy, City Engineer of Rockhampton, Queensland, read a paper on "Portland Cement."

Mr. Bellamy having made some historical references to the cement industry, said the engineer, architect, or builder was confronted by no problem more difficult than to say whether a particular kind of cement, when placed in any work, would behave in a pre-determined way. Especially was this true with an artificial cement. The difficulties arose from the fact that tests must be made on a product not in its final stage. With reference to the various tests, he said good Portland cement should be of a grey or greenish-grey colour. A brown colour indicated an excess of clay, and showed the cement was inferior. The test for specific gravity should always be carried out. Experiments which he had made showed that the specific gravity of good K. B. and S. English cement slightly exceeded 3.0, while an inferior cement was only 2.8. It was a well-established fact that, other things being equal, the finer the cement the greater would its sand-carrying capacity be—that was, it would show much greater strength with the same charge of sand, or equal strength with a greater charge. There was no doubt but that the cementitious value of the material resided in the very fine part. To ascertain the cementitious value of the material a new form of testing apparatus—known as the Goreham Flourimeter—had lately been devised. It was of very simple construction. The tests of strength might be divided into compressive and tensile tests, the latter including the transverse test made by breaking a beam of the cement. Tests of compression were certainly of some importance, but the apparatus required was rather cumbersome, and these tests were very rarely carried out. The ratio of compressive to tensile strength for the same class of cement was perfectly uniform. It might be assumed that resistance to compression was about twenty times that of the tensile strength. For many years Portland cement was always tested neat. The consensus of opinion, however, was that the test to sand, prescribed by the German Government, viz., 3 parts of sand to 1 of cement, was preferable, as it more nearly approached the conditions under which cement was used. Especially was this test essential if the mortar was to be used in work on the Monier system. No matter how excellent a cement might appear to be in other respects, it was imperative that it be not used if unsound. The temperature of air and water and the quantity of water affected the time of setting. Specifications, as a general rule, contemplated a temperature varying not more than from 10° to 62°F., and the quantity of water for Portland cements was 20 per cent.

Mr. H. Anderson (London) said the enormous variety and the fads of the numerous specifications called for by engineers was most confusing, and difficult and expensive to supply. The standard specification would be issued this month, and it was to be hoped that the complaint would not lie against this as being a stumbling block to cement progress in this country. The terms of the specification he had seen, and it was really very moderate in its clauses, and, to his mind, might have been with advantage in some points made

slightly more stringent; but as it was advisable to run before they could leap, it was probably advisable to test the working of the clauses as they would be issued, and then at a later date revise it in the points where it was found advisable to do so.

THE ARCHITECTURAL ASSOCIATION.

A SPECIAL general meeting of this Association was held at No. 18, Tufton-street, Westminster, on Friday last week, Mr. Louis Ambler, Hon. Secretary, presiding in the unavoidable absence of the President, Mr. E. Guy Dawber.

On the motion of the Chairman, seconded by Mr. Francis Hooper, the following new-by-law was agreed to without discussion: "The Association shall not make any dividend, gift, division, or bonus unto or between any of its members."

The ordinary general meeting was then held. The minutes having been read and confirmed, the following gentlemen were elected, i.e.: Mr. W. Baird, London; Mr. F. L. Hunt, Tooting; and Mr. W. H. Brerley, of Leeds, who was elected by acclamation.

Building Fund.

The Chairman announced the following further donations to the Building Fund, i.e.: Messrs. J. Carmichael, 50*l.*; W. Cowlin & Son, 5*l.* 5*s.*; J. W. Penfold, 5*l.* 5*s.*; R. F. Chisholm, 5*l.*; George Wragge, Ltd., 3*l.* 3*s.*; Sir John Taylor, 2*l.* 2*s.*; C. A. Sharp, 1*l.* 11*s.* 6*d.*; R. W. Collier, 1*l.* 1*s.*; F. E. Lloyd-Downes, 1*l.* 1*s.*; G. H. Lovegrove, 1*l.* 1*s.*; G. H. Oatley, 1*l.* 1*s.*; L. Simmons, 1*l.* 1*s.*; Neil C. Smith, 1*l.* 1*s.*; H. Tanner, junr., 1*l.* 1*s.*; and E. G. Theakston, 1*l.* 1*s.*

The Late Mr. Bedford.

The Chairman said that many of them had seen the notice of the death of Mr. F. W. Bedford, and all who had done so would have seen it with regret. Those of them who knew Mr. Bedford well would join with him in an expression of sympathy and condolence with the relatives of the deceased. Mr. Bedford, who was a brilliant student, and who carried off a great many prizes, had been in practice in Leeds for several years, but recently he returned to London. All who knew Mr. Bedford's work must admire it, and they would all regret that they would have no more of it.

The motion was agreed to in silence.

On the motion of the Chairman, a vote of thanks was accorded to Mr. F. T. Verity for allowing a party of members to visit his new theatre in Tottenham-court-road on Saturday, December 3; also to Messrs. Allen & Son for providing refreshments on that occasion.

Mr. Ambler also announced the following donations to the library: "Specifications in Detail" by Mr. F. W. Macey, presented by the author; "The Conduct of Building Work," by Mr. J. Leaning, presented by Mr. B. T. Batsford. A vote of thanks was accorded to the donors.

Some Architectural Reflections.

Mr. T. Raffles Davison then read the following paper, entitled "Some Architectural Reflections":

"The architectural divinity which we worship is the cause of much uncertainty and illusion. At one time she is all smiles and charm (when we have just received a commission); at another she is petulant and frowning (when our builder goes wrong, or our design has turned out to be a failure). If we have been enjoying the ecstasy of design, or, better still, the tangible products of it, we see nothing but the heaving smile of our goddess. But when we are plunged in some of the thousand troubles which seem to dog the architect's path, we find our charmer cold and fickle. You may say this is only the lot of all trades and professions. But it has always seemed to me that a pursuit which needs for its very start and impetus a spirit of inspiration and enthusiasm, the art of architecture is peculiarly liable to rebuffs, discouragement, and disappointment.

Influences.

Sometimes when we regard the calm, calculating, scholarly man who really thinks his own thoughts, we are apt to doubt whether he is really much under the influence of others. Well, in proportion as his work is scholarly, he is very much under the influence of others, and it is a question whether any of us are as free of influence as we imagine. There have been, and are, amongst the ablest of architects, those who hold that the only safe road for architectural development is in the path of

tradition, and that no sound progress can be expected except little by little in the development of what we have already laid before us. If this be true, we must acknowledge and yield to influences as one of the prime factors in our life. One can hardly doubt that the monumental treatment of Mr. Geo. Gilbert Scott's Liverpool Cathedral has its being partly through the influence of the late Mr. J. D. Sedding and Mr. Henry Wilson, grafted on to the scholarly ability of the late Mr. Gilbert Scott.

Personality.

And now the question of influence leads on to the consideration of personality. To my mind, for good or ill, we are here for an individuality of existence, and our concern should be with the upholding, and upbuilding of that individuality. For the progress of art it seems to me individuality is the most precious asset. Years ago I remember its being suggested to me to go to a certain place to sketch. When I objected that So-and-so and So-and-so had been, and that, in fact, everybody had been there, the reply was: "What is that to you? Have you been?" Now this is surely the essence of art. Why, when the Greeks had earned undying fame by their work, was there room for the Romans? Why, after St. Peter's was there room for St. Paul's? Why, after the countless gems of Gothic art need Mr. Scott try to do it again at Liverpool? Because, surely, of the need of individuality to exercise itself—the individuality of our age speaking through the individuality of the architect. Herein lies our hope and our pleasure. If we are to be the characterless transmitters of a type, where does the joy of our life come in? Is impersonality a desirable feature in architecture? Or is it possible? When we think of the distinctions that were expressed in the work of Burges, of Street, of Pearson, and of Sedding, do we not know that there is no such thing as impersonality in art? And do we not feel how dull and sad it would be if it were possible? I think if you look round your acquaintances you can carry this study of personality a little further. Is it not the little eccentricity—may we not say the little fault—that gives a flavour to our friends? Should we really like our friends so well were they all quite perfect and ready for Heaven? And can we quite dissociate this feeling from architecture? The quiet, smooth, scholarly work of Pearson might sometimes spell monotony; the vivacious interest of Sedding's work might sometimes mark unrest. Do we, therefore, forget the debt we owe them? Assuredly not, and if they have the defects of their qualities, it serves to drive home and enforce the lesson they had to give us. Now, the emphasis of certain characteristics which make a man into a Smith, a Brown, or a Robinson, give vital interest when applied to architecture. We are told that Nature cares only for the type, and not for the individual; that we must think of architecture, and not of architects, but we need never forget that we have to create the type and the art by means of individual effort. If an architect is worthy of the name, he is sure to stamp his work with a certain something by which you will know it to be his, just as you would tell his handwriting.

A scholar and a reverent student of type will show by his efforts that he is trying to keep them in mind, but his own inclinations will appear through all, and one has only to compare the work of men like Bodley, Champneys, and Jackson to realise how true this is. They were all supplied with the same material, and they have all done something definite for modern English architecture, but they have all made an individual and legible rendering of their art. It is not, of course, by a conscious effort to pose as individualities that this comes about, but by the serious effort to put one's mind into one's work. All good art comes by a following of Shakespeare's advice to be true to ourselves, and not to affect the methods of others; that is, to let our own personality dominate our efforts. Why should we sacrifice our own aims and desires in imitating another man who has been successful in quite different methods? Why stir up the cold soup of the Queen Anne period if we prefer the fiery spirit of the Spanish Renaissance? Why fit up the details of a Gothic church in the archaic simplicity of an Eastern style if we ourselves are sympathetic to the ornate decoration of the perpendicular period? Why adopt coupled dormers which another man has made effective

if our conscience rebels against the costly gutter between them? Why copy the latest competition success if it goes against your sympathies? Why change your style of architecture every week to suit the supposed leanings of each new assessor whose judgment seat you have to face? Why? To catch the favouring breeze that will waft you to success? To show your versatility? To show your largeness of mind? But the architectural studio is not a draper's shop to fit the passing fashion or the client's whim. It is the school in which you are learning to develop your own aim by a steady light of firm belief, and it cannot be illuminated by Will-o'-the-wisps or shooting stars. I think I remember when all gables did not have little kicked-up kneelers; when there were fewer country cottages with long, sloping buttresses; when there were no gable apices like those at Scotland Yard, and when there were perhaps no modern boundary walls built up from pier to pier with inverted arches. Yet these interesting little details by Messrs. Bentley, Voysey, Norman Shaw, and E. S. Prior have been clung to for salvation by many who were drowning in a sea of influence for want of the lifebelt of individuality.

Catholicity.

Some folk might construe this adoption of nice bits into catholicity of mind. Well, if we come to that we must make a strong stand for catholicity of temperament. For no wide culture, no liberal art, can be at its best without it. The architects whose work I esteem most have a charitable eye for the work of others, speaking, of course, of work which can lay a claim to be called architecture at all. It is quite impossible for any two or three, or even twenty or thirty men, to embody all the good there is in the work of a generation. Neither is it possible to pretend that the marvellous ingenuities and graces of a great Gothic church sum up all the virtues any more than do the stately repose of a Greek temple, or the ponderous richness of a Renaissance chapel. You may find telling mass, and a kind of dignified picturesqueness in a great modern brewery, even if you have to come to it direct from the finality of repose and dignity in the pyramids themselves. You have found pleasure in a white glazed frontage in a narrow city street, for its gaiety, if not for its proportions; have felt the stimulus of life and interest in a building where all was bad but the modelled ornament; you have appreciated the quiet simplicity of a building which would have been maddening if repeated in big doses; you have noted many a lesson in good detail where the general shape and sky line of the building was sadly at fault. We all see these things, and the spirit of catholicity is to take the good from wherever it comes.

Restraint.

But the snare of catholicity is its possible degeneracy into a weakening of sound principle and a lack of restraint. From the very outset of our career we all feel that architecture is peculiarly an art for the constant exercise of restraint. Not alone in the thousand and one practical necessities of cost, size, uses of material, etc., which press on us most hardly in our younger days, but the absolute need of reticence and restraint over the impulses of design which we feel more and more the older we grow. A very able architect said to me lately he had been learning the art of "wiping out" all his life. But then his practice had been largely in big things. You can wipe out too freely in some things—in house design, for instance, and, if I may venture to say so, I think the wiping out process in that direction has gone too far with some people. The restraint is not a question of form alone; it is also to be remembered in the matter of colour. A gentleman whose work you all know and esteem said to me the other day he was convinced that you could not make a great or noble building in two or more contrasting colours. I am very much of his opinion, and within a few days of hearing the remark I came across a small country house roofed with grey stone slates, and walled in white rough-cast, which emphasised this opinion. The blending of grey and white in tones of one colour made this house extremely broad and telling in contrast with its neighbours. It is perhaps not the first duty of a house to look big, but it enforced on my mind the opinion my friend had just expressed. I have always left the same influence of breadth in Mr. Hare's municipal buildings at Oxford, which, with all their elaborate detail and picturesque treatment,

have that quality by the blending of grey stone slates with the stone walls.

Character.

But with all the need for an ever watchful restraint we cannot afford to lose expressiveness and character. I have heard it said that anything is better than 'sleepiness.' Now this is perhaps a debatable point in architecture. A certain amount of 'sleepiness' is perhaps very good, for you surely want first of all to convey the impression that your building is satisfied with its site, and that so much of repose is imparted to it as will convey that feeling. Sleepiness is greatly preferable to *l'art nouveau*. It is traversing well-known ground to say that the exterior expression of a home should be homeliness, of a bank dignity, strength and repose, of a music-hall brightness and gaiety; in a palace of justice, calm dignity, and so on. But really we find these necessary initial characteristics are often quite ignored. We see the small house built with features only suitable to a large one, and a great house made up of petty triflings. We find bank buildings fussy, restless, and mean; music-halls heavy, lifeless lumps of buildings; hotels dull and dreary; and churches frivolous, and every kind of ingenuity tried to evade the one vital character needful. But the special character needed for each particular building will always be controlled and affected by the personality of the man who designs it. Let your building be ever so simple in style, the ingenious architect will make his ingenuity apparent; or on the other hand, however elaborate in detail a building may be, an architect of a stolid, unemotional character can easily clothe it with deadly dullness. You can be dull with a rich feast, and gay with a poor one.

Just as in going to a certain painter we hope to get his special gifts, so in going to a particular architect you must hope to obtain his characteristic vein of art. For his own home an architect might very much prefer to see the characteristic art of Mr. Smith, but for his business store he might vastly prefer Mr. Brown, who will give him more life and advertisement for his outlay. The quiet, scholarly work may be delightful for a literary institute, but might work with dullness in a house or stable. The designer of broad surfaces and large masses will not so readily give satisfaction in small work requiring interesting and dainty detail; the individual character of the man will be apparent in his work, and should be good enough asset for all his needs. If we make a trade of art, of course it would be our duty to supply to the order or whim of our client whatever he asked for, and if he desired a Bodelian church, or a Jacksonian college, or a Dawberian house we should make haste to supply it either by servile imitation on our own part, or by the employment of capable ghosts. But this is surely a wrong way to look at the art of architecture. We shall best serve the advancement of the art by trying to put something of ourselves into the study and practice of it. We shall use the knowledge we have acquired by education, and all the helpful influences about us, to do something of our own, and show whatever there is in us of individuality of character.

Disillusion.

Disillusionment awaits us at every turn of our life, and there disillusionments which are to be welcomed. But we must not get disillusioned about everything. It is well to know that if we only pay sixpence a cube foot for our foundations we may likely enough have half-a-crown to pay for our tower. We want no illusions about practical necessities or commonsense requirements. It is well to have no illusions about our friends, nor about the fine quality of our own productions. An architect once told me of the very kind and flattering appreciation of his work which his lady client bestowed upon it, and how he valued it, until one day she asked him if he had seen a very charming house by a certain other architect, which he knew to be the very poorest stuff imaginable. But these knockdown blows to a legitimate pride in our work must not bring a disillusionment which would check our ideals. The architect just referred to did not alter his style to the fancies of his fair client, but has gone on doing better and better work in his own manner, buoyed up by a consistent ideal of high quality. How often one hears the young architect exclaim against the want of proper appreciation of his public, forgetting they are not blessed with his own trained vision and sense. How dif-

ferently placed is the architect to the musician! In the musical world there is a wide circle of sympathetic hearing to count upon, and really good work seems sure of its reward. But the architect can reckon on no such audience, and beyond the appreciation of his fellows there is little to count upon. Of course, in great works like the Palace of Justice at Brussels, the general public are undoubtedly affected in a sense by the size, ponderosity, and richness of the group, but the finer intellectual qualities of architecture are felt by very few indeed. The sooner a proper disillusionment on this point is arrived at, the more an architect is thrown back upon his own beliefs for guidance and support, the better for him. And it must never be forgotten that the want of this self-support leads architects to look about for direction in the work of others who appear to succeed in pleasing the public. Thus individuality is sacrificed, whilst no really sustaining encouragement is obtained. One has only to watch the lead which is given by successful competitive designs to realise that.

But we must not let the disillusionment penetrate the armour of our faith. We know this to be founded upon the best architecture of all ages, and that our little villa, or church, or stable, is the product of some study and some knowledge of what is right and good in outline and mass, in nice proportion of solids and voids, and in good architectural emphasis and keeping. We have admired the calm repose and stability of the pyramids, the rhythmic proportion of the Greek temples, the sturdy picturesqueness of English Gothic, the elegant daintiness of those marvellous mixtures of French Gothic and Renaissance, the rich rococo of the Spanish churches, and the abiding charm of old English houses. We have learnt the spirit of these things, and we know that each of them conveys for us a lesson in architecture which may come every day into our practice. These are the sheet anchors of our art, and whilst we may never build a pyramid or a Greek temple or a Gothic church, we know that we may follow the principles which have guided the builders of such works with safety and success.

Gentlemen, when I look at the productions of our modern architects I often feel that our students need someone at their elbows to whisper in their ears something about first principles, about law and order in design, about inspiration, about self-reliance and personal enthusiasm. Art is a big word—it includes a vast field of human effort, and it is very difficult to talk wisely about, but with all its cold-water douches of needless repression, I feel that architecture ought to kindle a live and enthusiastic desire which would carry the earnest student through his life with happiness and success. A gentleman whose ability is supreme once said to me when going as a visitor to a class:

'I have to visit a class of students to-day, and I wish I knew what to tell them.'

'Well,' I replied, 'all they want to know is how you do it.' 'Ah,' said he, 'I'm afraid that's just what I can't tell them!'

That is just it. This gentleman could not convey the steadily balanced enthusiasm of many years' experience to more youthful minds; all he could do was to reiterate eternal principles of good, and to leave it for the natural instinct to adapt and work upon. It is not a shouting enthusiasm which can be of use in architecture (as it might be for the actor or the singer), but I maintain the enthusiasm should be there all the same, or the result of all our hard work will be very dull and lifeless show.

You have, perhaps, taken for granted that bills of extras, prices of materials, valuations, or any question of that kind would be left out of my view to-night. Even if I knew more about them than I do I should still want to take this opportunity to emphasize the essential fact that an architect has to be an artist, first and foremost. It is the only excuse for his existence. The term 'art-architect' is an absurdity. All architects are artists—at least, nearly all. Perhaps 500 out of every 5,000 are, at all events.

It is impossible to deny that the man who can advise as to the best kind of foundation, the best and cheapest building materials, who can secure the best builder at the lowest price, who can avoid costly encounters with the authorities or neighbouring property owners, who can obtain the best return for the building outlay, who can insure a sound and durable building, is a most useful person. But that alone would not constitute him an architect.

To be an architect worthy the name he must be something much more than this. Many an architect with all his ability is less of an architect than the clerk whose artistic instinct has failed to bring him more than a fair living. But, strange to say, whilst the man who creates the beauty of a building is often ill-paid and unknown, the businesslike man who poses as an architect trades on it to most profitable results. This has long been a standing reproach to the profession that the value of art is not even paired off as equal with the knowledge of business affairs and practical details. We must admit the great importance of business capacity, and of practical knowledge, but the art of beautiful design is an instinct that is the very crown and flower of our profession, and until this is better realised we shall never do great work; whilst a lasting service would have been done to London had the practical knowledge and skill that created the Tower Bridge been really emphasised by lines of beautiful form, instead of being masked by a falsity of architectural trimming which great engineers themselves must despise! In this country the art in such things is a matter of ornamentalism which can readily be applied and bought at a very small cost: it is not a development of the lines of construction into beautiful form, which could only come about by that uncommon genius, an artistic engineer, or by a thorough and serious collaboration of architect and engineer.

Your motto says, 'Design with beauty, build with truth.' These two things have got to be done together. Building with truth alone will not do, though some of the latest apostles of art would almost seem to suggest it will. Truth is often a very disagreeable thing by itself. The truth alone about many of our modern street frontages would be a terrible exhibition of girders and stanchions, though it is even worse when clothed with the beauty of false ornament.

No more difficult motto could be devised than this watch-word of the Architectural Association. We are delivered over into the arms of these two glorious creatures—truth and beauty, and it is not difficult for any student of human nature to know which of them makes the easier conquest. Beauty is very captivating even when her falsehood is only half concealed, whereas truth is always a little frigid. Beauty is always luring us on into unknown paths of wonder and delight. Truth is ever arresting our steps with warning in her voice. Beauty is always kind and silver-tongued; truth is always reading us a lecture; truth often seems to hate beauty's presence, but beauty always pretends to think well of truth. Truth seems grudging and niggardly, whilst beauty is prodigally generous. It really seems easier to cast in our lot altogether with one or the other, but very difficult to please both together.

One of the worst difficulties about the whole matter is that men have been trying for ages to find a sensible answer to the questions: What is truth? and What is beauty? and have been unable to do it. Of course, we all know that there is a sort of answer to be made to both, but it will depend on the character of each individual what answer he himself makes. Here is the point that we are called upon to decide. What shall be our critical balance between these two often apparently opposing elements, and how far shall we allow ourselves to be guided by one or the other? You can no more be absolutely truthful in your design than you can be in your speech. We none of us want to be the most perfect man in the nastiest way possible. We cannot afford to allow the jealousy of truth to banish beauty, and we must be ever on our guard against the lurking falsehood in beauty's heart. Who of us has not admired the effect produced by a good mass of walling in a position where it was not only perfectly useless, but horribly expensive? And can we find it in our hearts altogether to blame a really clever architect for doing such things? We have to 'shut the other eye' very often in architectural design. I could illustrate my point by references to some of our best architects.

But what I want to emphasise is the peculiar kind of tight-rope walk one has to make between the abyss of dull utilitarianism on the one hand, and the deep waters of ideal beauty on the other. Shall we say one word in passing for our practical friends who can tackle the many difficult problems of construction, of prices, or of tactful management of affairs which are so very useful to the successful architect? One

need not undervalue the services of such men whilst pointing out the high ideal of artistic endeavour which should form the goal of every real architect. It has almost come about, nowadays, in the bustle of modern life that we need another race of specialists who might be called architectural surveyors, and who without any trouble about aesthetics might devote themselves to the more practical problems which are their delight. Of course, they would be sane, capable men, and would probably be registered! They would earn the confidence of everybody because they could nearly always see that buildings cost less than was expected. They would not be hoodwinked by builders, quantity surveyors, clerks of works, or committees; and, generally speaking, would avoid all the faults of the artist.

The real artist must, however, always risk something. His mind is filled with ideals; he is generous not only with other people's money, but with his own time and strength, and if he completes his aims he is content to sacrifice a good deal of personal comfort. He thinks more of his art than its profession. He hopes to leave in concrete form some thoughts of beauty which have filled his imagination, and which may bestow pleasure on others. He is not engaged in tasks, but in delight; therefore, if he is not paid adequately in coin or goods, he has still had reward. We have heard of a good many such men. Literary artists who, to the commercial mind, have lived a life of mere suffering toil, but who to themselves have been blessed with visions which lifted their eyes above all their troubles—makers of pottery who were not owners of great works of world-wide fame, but were merely toiling away in obscure places to get glaze or colour to their liking, and who lost everything else to obtain it—painters of pictures who were willing to be accounted mad so that they enjoyed their own dreams in their own way—designers of great architecture who filled the offices of poorly-paid surveyors so that they might live with the building-up of a fabric that they loved. These are men who really live their lives, and of such rank and kind should be the architect. Through the thousand and one worries that encounter the realisation of graceful designs—the evil of bad workmanship, the folly of committees and the scamping of builders, the adjustment of accounts, the irritating restraints of cost and materials, bad building laws, bad assessors, and bad competitors—the architect must still live up to his ideal, and finally leave some impression of his art in the finished structure. The more he does this, the less he will be valued by his clients, the greater plague he will be to the authorities, the more annoying to his builders, and the more exacting to his employees, and, to crown all, the less he may be understood by the public, or appreciated by the critics. I can tell you that recently a well-known architect sent in with pleasurable anticipation to his clients a design which contained three features he had never carried out before, that he had designed with especial pleasure, and not relied upon to give interest and expression to his building. I saw him afterwards, and he told me that his committee with prompt and unerring discrimination ruled those three features out. They were not the best judges, but they were the dictators, and, as the late Geo. Gilbert Scott says, they got all they paid for in a good practical building, and the art, which was by-the-way, could never have been paid for adequately. The hardship lay not with those who never realised their loss, but it was a sample of the rebuffs an architect has to meet.

You may think the comfort is cold, and the reward visionary, which a true architect may expect, but art is a matter which lifts us above the beatitudes of trade, and the artist should learn to look for rewards from the same source whence his inspirations flow. Directly the breath is out of a man's body, the measure of his days is complete; his reputation is very much like his legacies of real property—it soon fades away. It is surely well to build our joys upon something less unstable than public estimation or something less uncertain than personal belongings.

For the artist the one great lesson to learn is to find the highest reward in the work itself, and that no art does more pertinently apply than that of architecture. It is so undervalued by the public, so little understood by the critics, that we are best to form our own public and our own criticism. We are

told again and again that the profession is not one in which fortunes can be made except by the very few. But all who enter it can set themselves determinedly to find their pleasure in its practice; to have great ideals and live up to them. The art is the noblest and most useful the world knows. It ministers to the wants and to the sentiments of all, and the architect may find happiness for himself beyond the common measure in learning how to design with beauty and build in truth. You cannot suppose I have followed the doings of architects for many years, and made over ten thousand drawings of architecture, without realising that there is a way to successful accomplishments in the profession. There are men who one admires as architects, and respects as personalities, who have kept alive their efforts through years of earnest work and sustained endeavour. They point the way for us all to emulate. The lesson of their work is its persistent hold on what is good, in the constant thought of fine outlines, good proportions, refined details, and expressive character. You can do no more, and you can do no better, whatever style you affect, or however eclectic you choose to be. You can aim high even in the simplest work. As surely as you do this you will find out what architecture can really be, and realise to the full the difference between the ephemeral meanness of a Cockney villa and the elemental grandeur of the pyramids."

In the discussion which followed,

Mr. Francis Hooper said he should like to propose a cordial vote of thanks to Mr. Davison for his paper, which had been read with such enthusiasm. The Association welcomed him as an old friend—if not personally, yet through his sketches, which had been of such value to them, not only in drawing attention to the beauty of the country and the architecture of bygone days, but in bringing before architectural students the best work of our best architects, and for that he deserved the thanks of them all. Many of the remarks in the paper were to some extent truisms, and if tending to make his audience exalt the work of architectural designers his labours would not have been in vain. In reference to one part of the paper, it was the need of every member of the profession, whether old or young, to try and appreciate the good work done by other people. It was so easy to find fault, and it was so difficult to do well, and Mr. Davison made a point of urging that all should try to acquire the spirit of catholicity, and take the good from wherever it comes. At the close of his paper Mr. Davison drew attention to the sacrifices which had been made by men in the furtherance of their art, and that should be of encouragement. There were to-day as self-sacrificing men as in the days of Palissy and the painters of Italy, Holland, and Spain. There were men who were seeking ideals, and their work might be but small, yet it would last.

Mr. A. Cox said he had much pleasure in seconding. He hoped to hear Mr. Davison lecture again, for he was always so full of enthusiasm.

Mr. Louis Jacob said they had all enjoyed Mr. Davison's admirable paper. He had been very much interested in the remarks as to individuality, for whenever he read those discussions which occasionally took place on originality in architecture he had always thought that the speakers had got hold of the wrong word altogether. There was no such thing as originality, for there was nothing new under the sun. What was wanted in architecture—and Mr. Davison had expressed it well—was individuality. As to the closing remarks about the men who lived long ago striving for the success of their ideals, that reminded him of the definition he had heard of heroism, i.e., a giving out of oneself. Every true and lasting thing which we could do must be heroic, and that could not be without that element of self-sacrifice.

Mr. A. H. Belcher supported the vote of thanks. There were two points impressed on his mind, and the first was as to individuality. He was glad that had been mentioned, for it got rid of the question so much talked about as to styles. If they studied architecture with a view to carrying out the motto of the Association, i.e., to design with beauty and build in truth, and kept that before them, he did not think they would be troubled as to which style to design in, for they would carry

out what was required by means of their individuality, and with the knowledge they possessed. The other point was as to business. He felt that they should remember that they should carry out to the best of their ability all the wishes of their clients. Mr. Arnold Mitchell made some excellent remarks some time ago when he said that the architect lived to please his client. The client paid for the work and the design, and architects should endeavour to please the client even down to the smallest detail. It was said that some architects would build a house and forget to put cupboards in the rooms. In some rooms there was a difficulty in arranging cupboards, but the point should always be kept in mind, for if they could get a cupboard in every bedroom they would please the client in most cases. It was the same in other little matters. If they could put the hot water cylinder at the bottom of a cupboard, and arrange for the upper part to be used for linen, there again they would please the client. If they pleased the client in small business points they would find that the house would become beautiful to the client even on those grounds.

Mr. H. Passmore said they must all be obliged to Mr. Davison for taking them into higher heights of architectural thought than what they were accustomed to. As to restraint, he entirely agreed with Mr. Davison when he said that restraint had been rather overdone. To knock a square hole in a wall and call it a door was hardly making architecture, though, of course, no one could over-estimate the value of proper restraint.

The Chairman, in putting the vote of thanks, said he should like to express his admiration for Mr. Davison's work—both his sketches of old buildings, and his drawings of modern ones. Many of the points in the paper had been treated in an admirable and poetical way, and he appreciated very much what Mr. Davison said. As to originality, what was often called by that name was mere eccentricity, and he was glad that Mr. Davison had drawn the proper distinction between individuality and originality. As to sketching, some people took to making collections of drawings of works of art which were admired, and of which they desired to have records, and this was an important point; it was not merely a question of individual study; one tried to add to the accumulation of records for the use and pleasure of others. Mr. Davison said they ought to try to see beauty or beauties in everything. He quite agreed with that, for the importance of that was very often under-estimated, and one tried to find faults rather than beauties—not only in modern work, but in architectural work of all kinds. One was so apt to criticise and express dislike without looking for the beauties which were often to be found. He also agreed as to "wiping out" having been seen in recent years one could only describe the buildings or the styles as archaic; the square hole for the door, and the plain masses of brickwork, or whatever it might be, with absolutely no ornament or moulding to give it relief, was carrying restraint too far. He was glad that Mr. Davison referred to the beauty of buildings of grey stone and slates, and he (the speaker) might mention the beauty of "rustic" slates, which came from Preecey, in Wales, and were of a pale green colour, with a most beautiful film or covering of golden yellow and brown tints. Everyone would agree with Mr. Davison that all buildings ought to express their character as far as possible. One could not have that too often impressed on one. With regard to "ghosts," it seemed to him that a man who employed "ghosts" was not an architect at all in the proper sense of the word, but a tradesman—a purveyor of architecture. Mr. Davison referred to the appreciation of music, and distinguished that from the appreciation of architecture. Of course, the appreciation of music was largely a natural gift; one was musical without any special education, and could appreciate to a large extent even the most classical, as well as what was called the music of the future—Wagner, or any modern composer. The more one knew of music the more one appreciated it, but that knowledge was not essential to the appreciation of music as knowledge of architecture was to its appreciation. One could not appreciate architecture without some education in architecture. As to the question put to the architect who was going to hold a class, there was another question which might be asked. In addition to "How

to do it," they might ask, "How do you get it to do?" As to the expression "Art architects," it was a most ridiculous combination of words. An architect ought, of course, to be artistic, and if he were not he had no right to call himself an architect at all. It was just as ridiculous to use those words as it was to use the expression, "art colours." Mr. Davison's general conclusion seemed to be that if an architect was an artist that was sufficient.

Mr. Davison: I am afraid I hardly go so far as that.

The Chairman said it certainly was not his view. An architect must be, to some extent, a business man and a scientific man. The man who was an artist only could not expect to be successful; he must be much more than an artist only. Architects who were only brilliant designers, and were no good as business men, failed to get the amount of work they ought to get, and for that very reason. When one heard of architects whose works cost three or four, or more, times more than the client wished to spend one could not be surprised that the client ceased to employ them, and that other men were employed—men a little less artistic, perhaps, but with more business capacity. It always seemed to him that those architects who were artists only should be associated with business men as partners if they found they did not understand the business part of the profession. That was their only chance of getting on as they deserved. Very few architects could be satisfied with the beauty of their own work—they had to build up a reputation as well as erect buildings, and they could not expect to get more work if they always exceeded the cost a great deal; they must consider their client's as well as their own interests, and they must not think of beauty at all cost. Nor should the architect be the enemy of the builder, as Mr. Davison appeared to suggest. He (the speaker) did not hold that view at all. An architect ought to look upon the builder as his friend, as the man who carried out his works, and without whom he (the architect) could not expect to succeed in his work. Architects could not put up their buildings with their own hands, and they depended on builders to realise their creations.

The vote of thanks was then put to the meeting, and very heartily agreed to.

Mr. Davison, in response, said he looked upon the Association almost in the light of a personal friend. He had wished that some practical gentleman had spoken and given a corrective to his dreams and visions. As to the main object he had in view, what he had been saying was the sort of thing that might have been told to an assemblage of cobblers or of the House of Commons—earnestness and truth. The only difference with architects was that they had to add beauty to that. There was no need to urge anybody to follow the pursuit of beauty; we all follow and were all the victims of it. They had to apply the corrective, to use the instinct for beauty entirely subservient to the austere goddess of Truth. That was the finality of all things.

The Chairman announced that the next meeting would be held on January 6, when Mr. A. Cox will read a paper on "Libraries."

The meeting then terminated.

THE SURVEYORS' INSTITUTION:

Bricks and Tiles.

An ordinary general meeting of the Surveyors' Institution was held on Monday afternoon at No. 12, Great George-street, Westminster, S.W., Mr. H. T. Steward, President, in the chair.

The minutes having been read and confirmed, Mr. J. C. Rogers, secretary, read a list of donations to the Library and the Library Fund, and on the motion of the Chairman a vote of thanks was accorded to the donors.

Mr. J. Jopling then read a long paper entitled "Notes on Clay-Working. More Particularly Bricks and Tiles." In the course of his remarks he said that there are between four and five thousand brick and tile works in the Kingdom, employing a large number of hands and a huge amount of capital, much of the latter being unproductive. The author gave a description of the various kinds of bricks and their methods of production, commencing with—

Stock Bricks, or London Stocks.

This description, he said, was, as a rule, given to hand-made, clamp burned bricks, although large quantities not called stocks were made in exactly the same way, in a mould on a stock,

but were kiln burned. They might therefore take it that as a rule a stock brick was clamp burned. The system under which they were produced was a very ancient one, in many ways hardly varying at all from that pursued in the times of the ancient Egyptians. The method of production was shortly as follows: The brickearth or clay was dug in winter, and curbed up to let the weather get at it. Some of the earth was washed in a mill, screened, elevated, conveyed by wooden shoots or perhaps pumped through iron pipes and delivered on the top of that already put up. Chalk, in varying proportions, was also washed into slurry, and added. When the water had been run off ashes (called soil) were then added, all in perfectly regular layers of even thickness. The actual making lasted through the fine weather of late spring, summer, and early autumn, about six months, according to the weather, and was conducted as follows:—The temperer breaks into the back, or heap of prepared earth, cuts down the layers of material already referred to into a heap, and wets, mixes, or tempers it. It is then taken to the pugmills by tram or harrows and pugged. The pugmills are so arranged that the pugged dirt is delivered to the moulding tables, and from the moulder to the hack ground, with the least possible labour. At the moulding table the moulder and his assistant, the walk flatter, takes it in hand, and the clot, or walk of clay, for each brick, having been flatted, or worked roughly into shape by the walk flatter, the moulder moulds the brick, places it upon a pallet board, and then on to the page, or direct on to the off-bearing barrow. The off-bearing wheels the bricks to the drying ground, and hacks them up to dry; they are in due course skinned, and when dry wheeled on a crowding barrow to the clamp, set, and burned. When burned sufficiently, the clamp is broken into, and the bricks sorted and loaded or stacked, as the case may be. Some stock bricks are moulded five or six at a time (instead of moulding by hand) by means of a combined pugging and moulding machine, all the other operations being the same, but in this case the material has to be somewhat softer, and consequently difficult to pile on the hacks, and taking longer to dry.

The product of a clamp varies a great deal, and the bricks are called stocks, hard, yellow, bright, and washed stocks, shippers, grizzles, place, shuffs, and burn-overs, the latter being those under burned, and to be burned over again. All of these vary in value, although they have cost the same to produce. Much depends upon the burner who manipulates the draught by means of clamp boards. The fuel consists of the ashes, or soil contained in the body of the brick itself, and breeze in layers, between the bricks, at the lower part of the clamp. In the ordinary way all the bricks in a clamp, except shuffs, should stand the weather, although place bricks are generally used for internal work. A well-made, properly burned stock was one of the best all-round bricks for use, and he, for one, was sorry that this system is being extinguished; but it is practically impossible to burn a clamp with the usual fuel without giving off fumes that are very objectionable, if not injurious to health, and so far he had not been able to discover anything to take satisfactorily the place of the ashes. Some of the very finest examples of brickwork existing, both as regards appearance and durability, are of stocks or clamp burned bricks. Look, for instance, as regards strength and durability, at the brickwork in heavy railway work, arches, etc., all over London, built many years ago when the rush was on, and anything that looked like a brick was accepted. Although designed to carry traffic of less weight, speed, and frequency than is now the case, the majority of the work is as good as ever, and unless removed, will be good when much of the work of late years has gone.

Plastic, Hand-moulded, Kiln-burned Bricks.

These bricks, produced very much on the same lines as the stock brick, except that they are burned in kilns instead of clamps, comprise the highest quality of bricks we have at command. The material is, or should be, dealt with as before described, except of course that in the case of reds no chalk is added, for lime in any form is fatal to a good red colour. Ashes are of course not used, and sand is used for mixing with the clay, and for shading the washed earth, when drying in the washbacks. For buff or white bricks, sand from the river is needed. They are moulded in the same way as stocks

but more carefully, and in wooden moulds instead of steel, and the drying, whether in the open or in sheds or dryers, needs careful watching. When dry, they are burned in kilns, with coal as fuel. Some are pressed, this being usually done in the sheds with portable presses, when the brick is leather dry. Ornamental bricks, or odd stuff, are moulded in box moulds, not on a loose stock. The product consists of various qualities and shades of red, buff, white, etc., according to the material used and varying also with the degree of heat applied in burning. From the quality point of view we get the best in this class, and he personally preferred, so far as appearance goes, a sand-faced brick to those with a smooth face.

Efforts have been made, with considerable success, to supersede hand moulding by using moulding machines for high-class facing bricks in order to avoid the irregular application of moulding sand, and yet turn out a sand-faced brick. Some of these machines are worked by wheel, or lever, others are driven by power. The cracks and flaws in this class of brick are usually the result of carelessness on the part of the moulder in preparing the clot or cleaning his mould, and there is great difficulty in overcoming this, for the liberal use of sand lightens the moulder's work. Cutters and rubbers, as well as odd stuff, require great care throughout, and in some cases the whole of the material is washed and carefully screened. Plastic, hand-made, kiln-burned bricks are probably the most profitable to the maker, their extra value being much in excess of the extra cost.

Plastic, Machine-made, Kiln-burned Bricks.

An enormous quantity of excellent bricks are produced at a moderate cost by this system, and in view of the fact that clamp burning has fallen into disrepute upon ordinary sanitary grounds, it was his opinion that the plastic, machine-made, kiln-burned brick is the common brick of the future, whilst a goodly proportion of the total would be excellent facing bricks. Extra care in handling and pressing will (apart from the sand-face appearance, which, of course, is a matter of taste) give results in quality and colour equal to the hand-made bricks. For all general purposes they are strong and hard, if properly burned will stand any weather and any strain that can be put upon them in practice, and, what is more, they can be produced at a low price. The method of production is to dig the material, sometimes to weather it, more often to convey it direct from the face by barrow or tramway to the machines, and having machined it in whatever way one's judgment or experience dictates, a stream is expressed through a die on to a cutting-off table, where it is cut by wires into bricks. These are conveyed by barrows or on pallets and cars to perhaps an open drying ground, but preferably to a drying shed or dryer, and there dried. If dealt with in a tunnel or subclike dryer, they remain on the cars, which travel on rails from the machines to the kilns. If partly dried in a shed they are racked up, then pressed or trimmed, and afterwards passed through a dryer, but this applies more particularly to pressed facings and ornamental bricks. If the clay is very strong, that made into common bricks may have a small percentage of coal dust incorporated in the body of the brick, but this requires great care, and is of doubtful advantage.

Dry, or Semi-dry, Machine-made, Kiln-burned Bricks.

In this system you have the acme of cheapness, or, rather, low cost. Makers of this class of bricks, and of the plant for producing them, call them by all sorts of names, such as dry process, semi-dry, semi-plastic, stiff plastic, etc., but it all means the same thing, that is to say, it describes a brick in the manufacture of which the object in view is to eliminate water as far as possible, and thus save the expense of drying, depending upon enormous pressure and the burning, to so consolidate the various constituents as to make the brick homogeneous, but actual results in this case fall short of theory according to the material used and the way it is handled.

The system is as follows: The material is dug and kept as dry as possible (if too damp it is dried in sheds just as bricks are dried). It is then worked by pans or disintegrators into granular form, screened, elevated, and conveyed to the moulding machines or presses, thence direct to the kilns, where it is burned with coal fuel. The product is good in appearance, and is much in favour as a common building brick, its very low price being a great inducement.

This class of brick has been much improved of late. His experience, both in making and using them, went back nearly thirty years, and although the process is the same, the detail operations have been much improved and the product is more reliable than it used to be. In his opinion, these bricks, while most useful for filling in, or backing external walls above the damp course, and for all internal work (especially if not to be plastered) are not suitable for external work, foundations, or chimneys, and should certainly never be used for arches. The outer skin is intensely hard and dense, but the same degree of density throughout the brick cannot be transmitted by pressure, and the water contained in the brick is forced through the dense skin by the burning, causing minute cracks. Through these cracks the weather operates, the outer skin comes away, and this is soon followed by disintegration of the body of the brick.

Various other Bricks.

Speaking of other bricks, the author said:—"Blue bricks from the Staffordshire district have a great reputation for heavy work, paving, and many other purposes, but there are the real blue bricks and the so-called blue bricks, the latter only blue outside by reason of their being moulded in manganese or like material, the body of the brick being a dull red, and softer than a genuine blue brick. For strength and durability, apart from appearance, blue bricks cannot be beaten, but by reason of the heavy firing they undergo, and more particularly if pressed, the outer skin is dense and smooth, hence they are not desirable for arches. The hard, smooth skin prevents them from adhering to the mortar or cement, no matter how good it may be. This must have been palpable to anyone who has closely watched blue bricks being used. The smooth skin in laying attracts a film of water and does not adhere as it should. My own opinion is that this had a good deal to do with the regrettable viaduct disaster that occurred lately on the Great Western Railway."

A Standard Size for Bricks.

As to a standard size for bricks, the author said:—"Considerable attention has been given of late years to this question. . . . At one meeting I expressed the opinion that, to bring about a standard size, architects, engineers, and surveyors, in whose hands lies the power of specifying what they desire, should fix upon a standard size and specify it. The brickmakers would very soon supply what was specified. Since then a standard size has been decided upon, and that is about as far as we have got. There is no doubt it would be desirable to have one size applicable to the whole country, but custom has fixed the size in the Midlands and the North far in excess of that in vogue in the South; and it will take time to bring the conflicting ideas into line. There is little or no mechanical difficulty, and we can all help, but you will not, I think, get much help from the brickmakers, for there seems no unity of purpose among them, each individual or firm playing his own game, and cutting his neighbour in the most unreasoning manner. When you specify that the bricks shall be of a standard size, it ought to be clearly defined what deviation will be permissible before the bricks (otherwise perfect) can be rejected as not of standard size. Unless this is done hardship will result, for the rejected bricks, however good, would at once become of less value on the market, apart from the expenses attending rejection. This is all the more important, because in spite of all that is said by patentees and others regarding kilns, dryers, and machines, and by the competing manufacturers themselves, the fact remains that no matter by what plant or process produced, or in what kind of kiln they are burnt, there is a variation in the finished size.

Testing Bricks.

Many manufacturers make a strong point of their certificates giving results of crushing tests, etc. I am afraid I do not attach much weight to these, not that they are not genuine and correct, but they seem to me almost irrelevant. It is difficult to conceive in practice a properly burnt brick of any kind, in a position where it would be crushed by the superincumbent load. I have never seen such a thing. Of course, we have all seen cases where, through negligence, odd, under-burned bricks have been used which have to be replaced, but this does not apply. If by way of illustration it is estimated that the maximum pressure would be 1 ton on the square foot, and you use bricks that you know will

carry 10 tons, why be influenced by a certificate setting forth that certain bricks will carry 30 tons? There is no advantage whatever. Among other tests is a rattling test. This I cannot understand. We try to avoid rattling bricks, and bricks are made to build with, not to be rattled, and no one would say they are earthquake proof. I presume the idea was to note the effect of the rattling on the arris of a brick; if so, would it not be better to watch the effect of the handling they would receive in actual practice?

Tiles and Pottery.

The making is an important branch of the clay-working industry, and the demand for tiles is increasing. I am glad it is so, for although slates are a most useful and economical roof covering, we shall all I think agree that, as regards appearance, health, and comfort, tiles are preferable. Let your eyes roam over the suburbs and country towns, and note the difference of the red tile as against slates, while the difference of those living in the houses can only be realised by those who have tried both forms of covering. Of course, the timbering must be somewhat heavier for tiles, but really the difference in cost is not much, and tiles are made now so thin, accurate in size, and regular in camber that they compare more favourably than ever as regards weight and lying close. Whenever I have control of new buildings on estates, nothing would induce me to allow slates to be used for roof coverings. In the manufacture of tiles the processes, except in a few details, are much the same as in brick making. Of course, mild, sandy brick-earth will not make tiles. The bulk of those on the market are machine made and pressed, but there is still a demand for hand-made, sand-faced tiles, which, although thicker and less regular in shape, are preferred by many for their better appearance. Ornamental, hip, valley, ridge, and other tiles are, of course, used with the plain roofing tiles, and are made from the same kind of material, the majority by machine (band or steam power), while some of them, together with finials and snub like, are produced by hand. Pottery for building, domestic, garden, and ornamental purposes is another branch. A plastic clay, tough and elastic, is needed, and the common London clay makes very good ordinary pottery. The preparation of the clay needs more care than for bricks, or even tiles, but how this should be done depends entirely upon the clay itself and what form or class of pottery is to be produced. Drying is effected on pallets, racks, or shelves, in sheds artificially heated. There are many ways of doing this, but I have found the small bore hot water system the most easily controlled and economical, requiring practically no attention, except to the furnace, and that but little. The burning is generally done in intermittent kilns of the circular down draught type. Common goods are set open to the fire, the better class in seggars, and the closer the goods can be nested, or packed together, consistent with a proper draught, the better they will be burned and the less fuel will be used. This remark applies to all kilns and all clay goods. Prices for common pottery are small, but a fair profit can be made."

The author then spoke at some length as to starting, etc., new works; transport of the material and the product; management of works; supervision, stocktaking, book-keeping; the rating of brick fields; transfer of land for clay working; valuations; and dryers and kilns; fuel consumption, etc.

In the discussion which followed, Mr. W. E. Woolley proposed a hearty vote of thanks to Mr. Jopling, and in doing so referred to the old pantile as being an excellent material for roofing, especially for roofing farm buildings, and it had this advantage—it was easily repaired. He was glad that Mr. Jopling recommended canal transit for bricks. In his opinion, more use should be made of the common brick in buildings and less of the ornamental brick. Fine odd brick buildings could be seen in the southern counties—beautiful old farmhouses, etc.—and in their construction would be found none of the ornamental brick work he referred to; the effect had been obtained by the proper use of the ordinary red brick.

Mr. J. L. Crouch seconded the motion, and referred to the difficulties in the way of the standardization of bricks—the great difference in the thickness of the bricks made in the North as compared with those of the South. The Institute of Architects allowed a margin

in its standard, and when a margin was allowed the standard ceased.

Mr. G. Tucker said that Mr. Jopling had referred to the unsuitability of blue bricks for heavy arches, but if the author had said that pressed blue bricks were not suitable he would have been more correct. The wire-cut blue brick, with its face rough, was admirably adapted for arching; there could be nothing more substantial than a blue brick wire cut, and that applied to almost every brick used for similar purposes. Dry pressed bricks were of various qualities—in some districts they were good and in others they were bad. In his opinion the best bricks produced at the present time were hand-made bricks.

Mr. Thomas Blashill said that the question of the standardization of bricks had been thoroughly worked out, and that to that end the Science Committee of the Institute of Architects were assisted by brickmakers, engineers, and others in working out the matter two or three years ago. The result was the R.I.B.A. standard size of bricks, and he suggested that that might be embodied in the paper.

Mr. E. W. Hudson and Mr. W. Eve having made some remarks, the vote of thanks was heartily agreed to, and Mr. Jopling replied.

It was announced that the next meeting will be held on January 16, when Messrs. A. R. Stenning and Menzies will read papers on "The Form of Rural Building By-laws." The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION: VISIT TO A NEW THEATRE.

WHEN the old Prince of Wales's Theatre, near Tottenham-court-road, was closed playgoers felt that London had lost one of its historic places of entertainment, and certainly the lapse of some twenty years, during which the old buildings were in process of decay, has given little hope of restoration. It will, however, be of considerable general interest to know that the past associations are to be revived in a fine new playhouse about to be opened—a house in every way a splendid addition to the increasing list of London theatres.

A large body of members of the Architectural Association visited the new buildings on Saturday, December 4, by kind permission of the architect, Mr. F. T. Verity, who, together with his chief assistant, Mr. Gill, described the structure and explained the methods by which the difficulties of the scheme had been overcome. The following notes are intended to convey general impressions gained from a tour of the theatre, to which it should here be said no name has yet been given.

Although excellently planned so far as the seated audience was concerned, the old theatre was terribly deficient in the extent and nature of its approaches and outlets, and this may be said to have been the main reason for its compulsory closure. We gave a historic reference to the building on October 26, 1901, mentioning the founders and some of the more important players who achieved many triumphs within its walls. The whole of the old premises were demolished last year with the exception of the original portico spanning the pavement in Tottenham-street, now marking the new stage-door. In order to provide exits to two streets, and to conform to other L.C.C. regulations, properties bounding the old site on the west and south were acquired, so that the site becomes practically doubled in length and in width for the new scheme. The north-west corner is planned as a two-floor restaurant with basement kitchen and offices, and the uppermost stories are arranged as residential suites, part of which overlap the theatre buildings.

The main entrance is now transferred to Charlotte-street, and other entrances and exits are provided in Tottenham and Pitt streets, thereby giving excess in means of escape. The generous space in the halls and gangways is one of the many wise provisions in the design.

With regard to the exterior, it is to be regretted that the Charlotte-street, or principal front, has little to proclaim the presence of a fine playhouse; the stone doorway is massive enough, but the superstructure, faced in brick-work with cement dressings, loses force by the smallness of parts necessary to the restaurant and flats already mentioned. The opportunity for the broad masculine treatment of a façade is supplied by a theatre in such a way that few public buildings offer, but the designer is not always responsible for omitting to seize the chance.

To the interior the importance of a theatre belongs, and in the example under notice no pains have been spared to produce a convenient and roomy house. The first impression received is that here is a playhouse designed and decorated by one mind—a truly architectural interior, even to the drop-scenes depicting Hampton Court Palace and the Palladian bridge at Wilton. The effect is satisfying to the esthetic mind, although it may appear heavy to the lay observer; but, it is extremely gratifying to find that the "gilt-compo" demon has been exorcised.

The seating accommodation of this "two tier house" is, approximately, for 1,250 persons disposed in almost equal groups in stalls, pit, dress and upper circles, and gallery. Only two private boxes, one on either side of the auditorium, are provided, to which unusual prominence is given by making them large structural features taking up the minor order of the interior. The cornice of this order is carried over the segmental arch of the proscenium opening, which makes a welcome departure from the hard, square outline of the universal lintol form. The principal innovation, however, is the introduction of two flights of steps in the auditorium descending from the cross circle to the stalls, and this produces an effect as pleasing as it is unusual. Each of the staircases passes below one of the private boxes already referred to, at which point a doorway leads from a half-landing to a refreshment saloon, so that occupants of the best seats of the house have ready and convenient means of retiring. Commodious saloons are arranged for the pit and upper circle.

We should say that this theatre is capable of rapid emptying, for, practically speaking, four exits are provided to each part of the house—two at the upper and two at the lower levels. The "sighting" of the seats is very satisfactory throughout, and the gallery is liberally considered in the matters of space and view. We anticipated that some mechanical means of ventilation would have been introduced to assist the natural method employed to purify the auditorium—especially in the gallery—but no such precaution is considered necessary. Some underground departments, however, are supplied with electric fans.

The design of the interior is broad and simple, having a large order carried round the body of the house. The cornice, panelled features, and walling are executed in a French composition stone—"stuc"—made and fixed by Parisian workmen. The texture is, of course, uniform, the joints are white and well marked, and the colour a warm sandstone resembling "Craigleith." Some excellently designed marble doorways relieve the general tone, but it may be said that colour, as usually applied to theatres, is absent and gives place to material.

"Behind the scenes," the interior presents the usual appearance of a stage. A new feature, however, is seen in the limelight gallery on each side wall to avoid confusion with operations in the "flies." The electric lighting arrangements, by Messrs. Higgins & Griffiths, are very interesting, and were put through various scenic changes for the benefit of the visitors. The drop scenes already referred to were designed by the architect and painted by Mr. T. K. Brown. Messrs. J. Allen & Sons are the general contractors. The President of the Association, Mr. E. Guy Dawber, made some very appreciative remarks upon the success of the visit, which was brought to a close by an animated expression of approval by the members.

AMERICAN STONE INDUSTRY.—It is officially notified that the figures collected by the Geological survey put the value of the stone quarried in the United States in 1903 at 73,384,200 dols., an increase of 3,553,649 dols. over 1902. In spite of troubles in the building trades, Pennsylvania surpassed all other States in the product of its quarries during 1903. The value of its stone amounted to 13,913,220 dols. New York is third, with a stone product valued at 5,742,853 dols., and Ohio is fourth, with a product worth 5,114,051 dols. The production of every other State was considerably less. The value of the output of the different kinds of stone in 1903 were as follows:—Granite 15,703,795 dols.; trap rock, 2,732,294 dols.; sandstone, 9,492,802 dols.; blue stone, 1,779,457 dols.; marble, 5,362,696 dols.; limestone for building, 26,642,551 dols.; limestone for flux, 5,423,732 dols.; slate, 6,256,895 dols.

Illustrations.

EAST WINDOW, ALL SAINTS' CHAPEL, ST. CHAD'S CHURCH, GATESHEAD-ONTYNE.



HIS window is the first of a series intended to represent Christianity as exemplified in the lives of her saints; selecting representative heroes of England, such as King Alfred, the Ven. Bede, Sir Philip Sidney, and Grace Darling.

This, the east window, is meant to bring into prominence the human aspect of the life of Christ. In the centre light he is represented as the Good Shepherd, and beneath as washing the disciples' feet. In the right hand light is St. John the Evangelist (the beloved disciple), who is represented in the predella, supporting the steps of the Virgin (who has been committed to his care) as they follow the hier on which the body of our Lord is borne to the sepulchre. The left hand light represents the Virgin with the infant Christ, and beneath the finding of Christ in the Temple.

The first aim of a stained glass window is to give a fine effect of colour. In early Gothic glass drawing is of very minor importance. The beauty is due to fine colour composition and to the gem-like quality of the glass. This quality owes much to the very imperfections of the material, its uneven thickness and variations of colour, and to the heavy leading due to the primitive method of cutting. The limitations of a craft are often its safeguards, and it is of the greatest importance that the designer should understand those limitations; should be, in fact, a craftsman as well as an artist. To ape archaic drawing whilst using flat, inferior modern glass and thin leads is to combine the defects of two periods. To be content with a flat rather than a pictorial effect, and to seek simplicity of line and dignity of pose is the lesson to be learnt from our early masters.

WESTBURY MANOR, BUCKS.

This drawing shows the alterations and additions to the old manor house, which comprise new library, drawing-room, and boudoir, and entirely new kitchen offices. The front of the old house has been remodelled, and the whole of the work done in local stone with Bath stone dressings and Leicestershire green slates. Messrs. J. Parnell & Sons, of Rugby, were the contractors, and the architect is Mr. Clyde Young, of London.

FRONTS IN TOTTENHAM COURT-ROAD AND OXFORD-STREET.

The front forming Nos. 216-219, Tottenham Court-road was built for Messrs. Bartholomew & Fletcher as show-rooms for their antique and modern furniture. Messrs. Jas. Smith & Sons, Ltd., of Norwood, were the contractors, the stone carving and modelling over the entrance being executed by Mr. W. Aumonier.

Nos. 455-459, Oxford-street, and 22, North Audley-street, were built for Messrs. Champion & Wilton, with spacious workshops at the back; the upper part of the building is divided into flats.

Messrs. Holloway Brothers, of Belvedere-road, Westminster Bridge, were the contractors, and Messrs. Walter Smith & Wheaton did the stone carving.

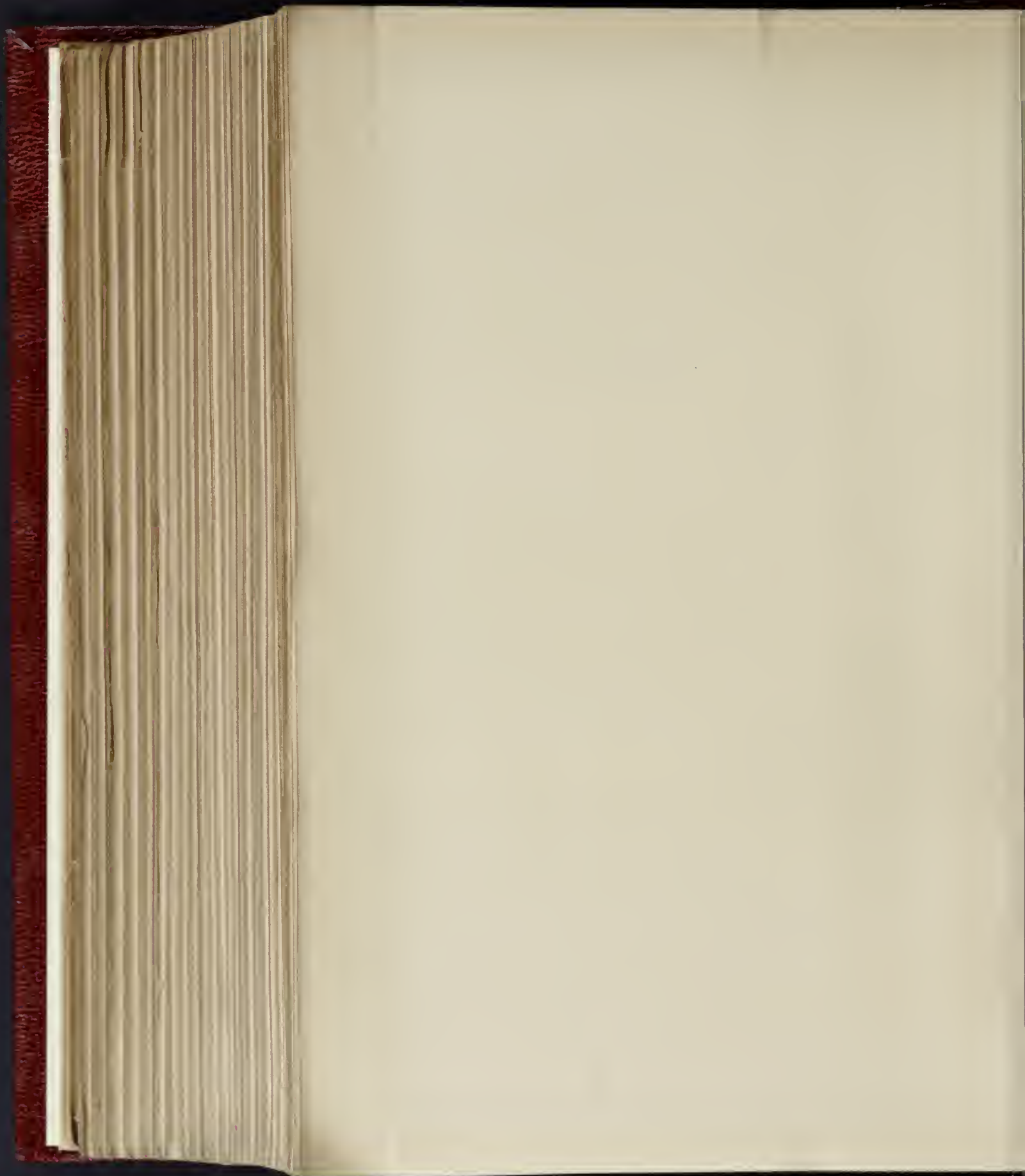
Messrs. Read and Macdonald are the architects. In this case we did not ask the architects for plans, regarding these designs mainly as additions to the visible street architecture of London, which is governed rather by lines of frontage than by special considerations of plan.

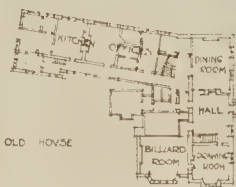
HOUSE, HEADINGLEY, LEEDS.

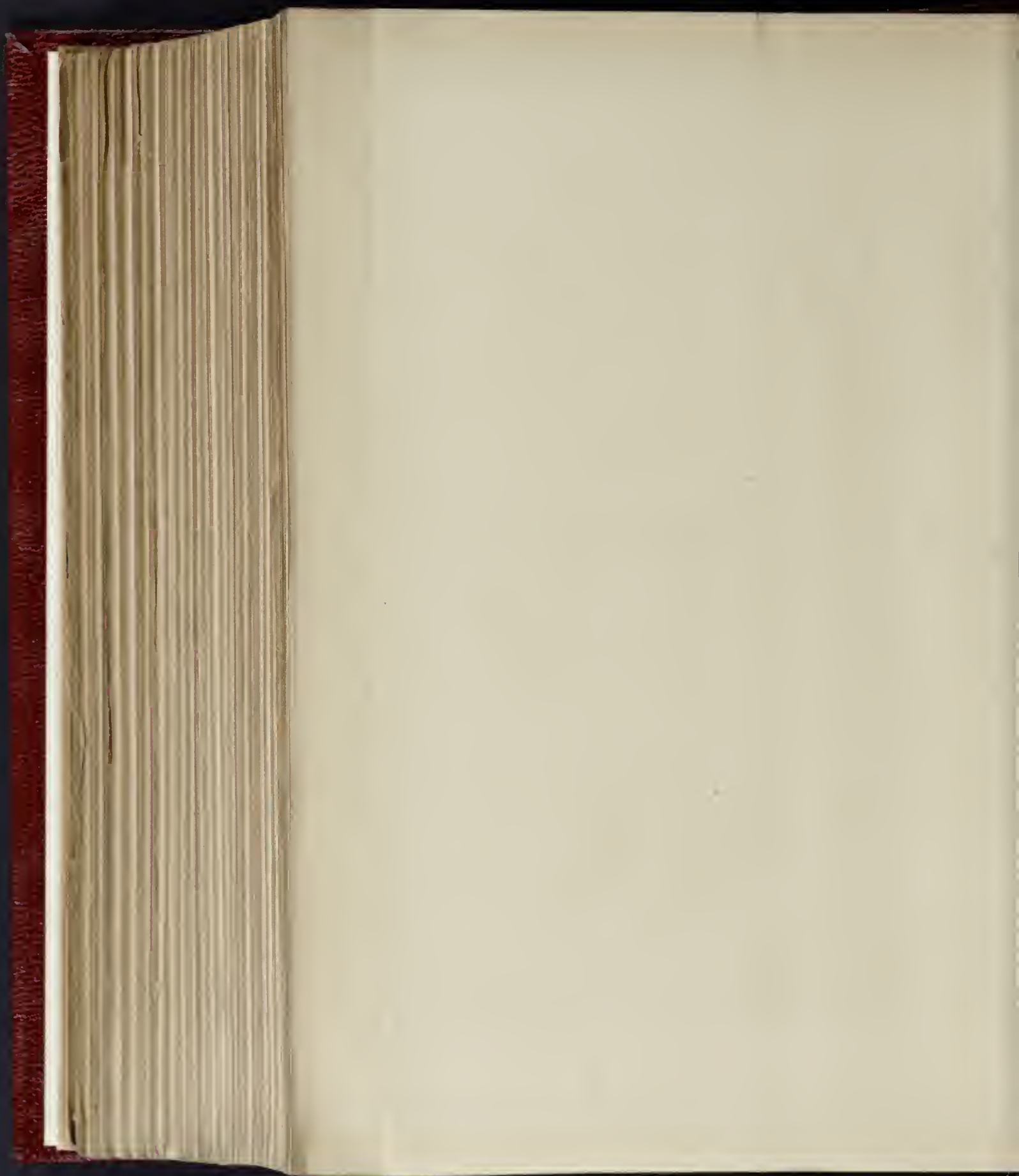
This is one of the houses carried out by the late Mr. F. W. Benford, whose early death we had to chronicle in our last issue. It is one of the buildings mentioned in our obituary article.

MISSION HALL, SEATON FIRST.—A new mission hall is being erected in Third-avenue in connexion with St. John's Church, Seaton First. When completed the building will accommodate 300 persons, and will be seated throughout with chairs. The dimensions will be 59 ft. by 27 ft., with a vestry at the west end, 27 ft. by 12 ft. Plans have also been prepared by Messrs. Hicks & Charlewood, of Newcastle, for the enlargement of the church. The plans provide for a west extension of 32 ft., and a south aisle, 80 ft. long and 19 ft. broad. The accommodation will be doubled.











THE PHOTO-SPRAGUE & CO. LTD. 4 & 5, EAST HADDING STREET, FETTER LANE, E.C.

216-219 TOTTENHAM COURT ROAD - MESSRS. READ & MACDONALD, ARCHITECTS.

THE BUILDER, DECEMBER 17, 1904.

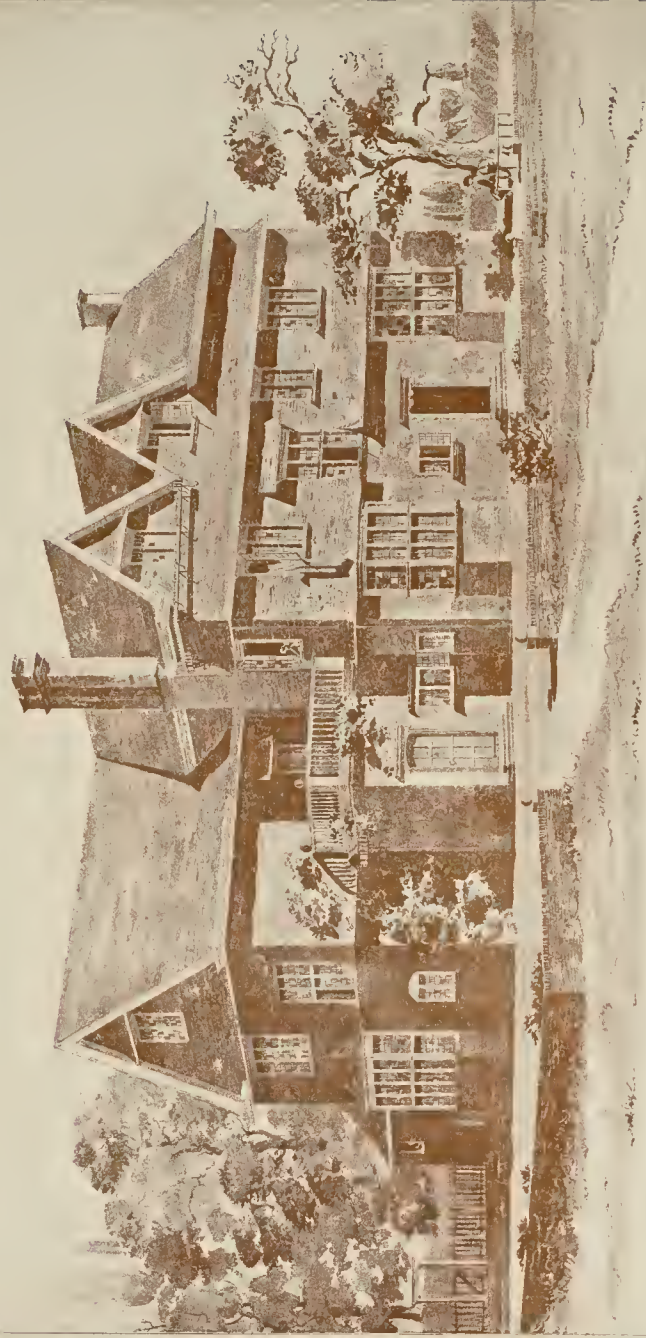


THE PHOTO-SPRAGUE & CO. LTD. 4 & 5, EAST HADDING STREET, FETTER LANE, E.C.

455-459 OXFORD STREET AND 22 NORTH AUDLEY STREET
MESSRS. READ & MACDONALD, ARCHITECTS.



- THE OLD CASINGS - HERBERTY -
- TWO BEVERLY ROSS, JOHN PERCIVAL, ETC.



- GROUND PLAN -

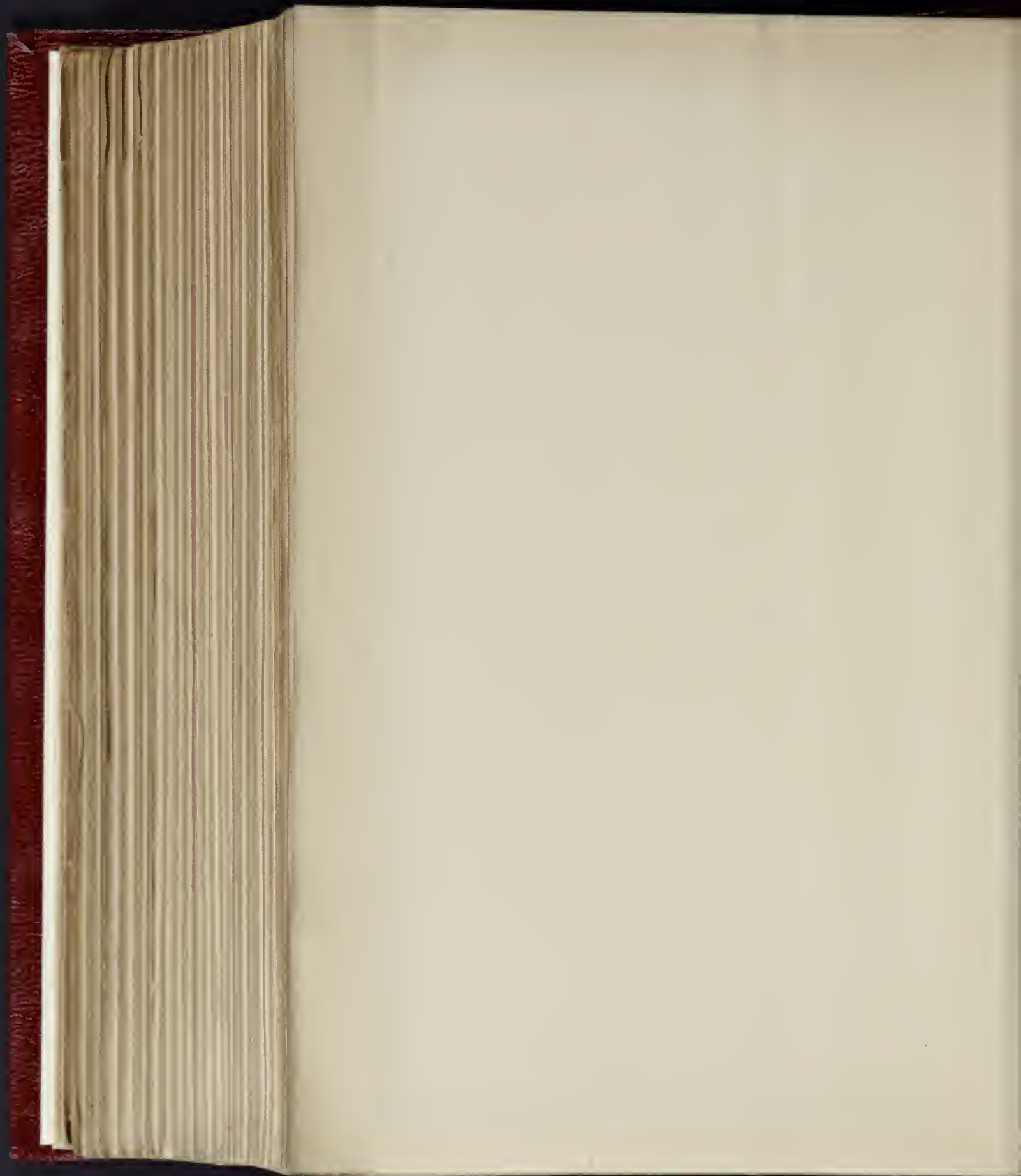
1/4" = 1'-0"

1/8" = 1'-0"

Francis W. Bedford
March 93!

188 PHOTOGRAPH BY E. C. L. & S. EAST HARBING STREET, LEEDS, E.C.

HOUSE AT HEADINGLEY, LEEDS.—THE LATE FRANCIS W. BEDFORD, F.R.I.B.A., ARCHITECT



THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, S.W., Mr. J. Williams Bonn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Hackney Borough Council 2,500*l.* for the construction of an underground convenience at Lower Clapton-road; Lewisham Borough Council, 5,065*l.* for erection of buildings at Home-park depot; and Wandsworth Borough Council, 17,700*l.* for street improvements.

Physical Deterioration.—The General Purposes Committee presented a report upon the improvement recommendations of the Inter-Departmental Committee on Physical Deterioration. The report pointed out that the opinions gathered from the great majority of the witnesses examined did not support the belief that there was any general progressive deterioration in the nation, physical deterioration being, as one witness put it, "practically confined to the poorest and lowest strata of the population, whose children are improprietly housed, and whose parents are improvident, idle, and intemperate." The committee stated that if this view was correct they felt that remedial measures were comparatively easy of application, as "the task of dealing with a concentrated rather than a scattered evil manifestly presents fewer difficulties." The General Purposes Committee now recommended that the most important recommendations of the Inter-Departmental Committee should be referred for consideration to the various committees of the Council most closely identified with the matters dealt with.

The recommendation was unanimously adopted.

Enlargement of School, Hackney.—On the recommendation of the Education Committee, it was agreed that the estimate, 3,690*l.*, submitted by the Finance Committee be approved; that expenditure not exceeding 3,942*l.* be sanctioned in respect of the enlargement of the Windsor-road school (Hackney, S.) by 180 places, and of the other works proposed to be carried out at the same time; that the work be executed by the Council without the intervention of a contractor, and that the drawings, quantities, specification, and estimate of 3,667*l.* be referred to the Works Committee for that purpose.

Islington and Hornsey Drainage.—On the recommendation of the Main Drainage Committee, it was agreed, after a long discussion, that the estimate of 27,500*l.*, submitted by the Finance Committee, be approved; that an agreement, in the terms of the draft presented to the Main Drainage Committee on October 27, 1904, be entered into with the Islington Metropolitan Borough Council and the Hornsey Corporation relative to the drainage of the Stroud-green area; and that the seal of the Council be affixed to the agreement. That so soon as the agreement between the Council, the Islington Metropolitan Borough Council, and the Hornsey Corporation shall have been completed, an advertisement be issued inviting tenders for the work of constructing a new sewer along Stroud-green-road, Tollington-park-road, and Grove-road into the Holloway storm relief sewer. That the operation of the standing order relating to the time for the submission to the Council of schemes involving applications to Parliament be suspended in order that the following recommendation may be considered. That Parliamentary authority be sought, in the session of 1905, to give effect to the provisions of the agreement with the Islington Metropolitan Borough Council and the Hornsey Corporation relative to the drainage of the Stroud-green area, and to give effect to the award, when made, upon matters referred to arbitration under the agreement.

Shelters at New Theatre Building, Charlotte-street.—In an adjourned report of the Building Act Committee, it was recommended that the Council, in the exercise of its powers under sections 22 and 73 of the London Building Act, 1904, do consent to the erection of iron and glass shelters to a theatre building abutting upon the east side of Charlotte-street, south side of Tottenham-street, and north side of Pitt-street, St. Paneras, submitted in connexion with the application of Mr. F. T. Verity on behalf of Mr. E. D. Maddiek; that the whole of the work be executed to the satisfaction of the District Surveyor; that no advertisement, sign, lettering, or device, other than the name of the

premises, be placed over or upon or affixed to such shelters.

The recommendation was agreed to.

Piccadilly Widening.—The Improvements Committee recommended:—That the estimate of 72,500*l.*, submitted by the Finance Committee be approved; and that the Finance Committee be authorised to take all necessary steps to secure the widening of Piccadilly to a minimum width of 80 ft. between St. James's-street and Duke-street, as shown upon the plan presented to the committee on September 30, 1903, subject to the Council of the city of Westminster agreeing to contribute one-seventh of the actual net cost of the improvement, provided however that if the actual net cost exceeds 72,500*l.*, the contribution from the City Council shall be limited to 10,493*l.* (which bears the same relation to the total cost as the amount originally offered by the City Council bore towards the original estimate), and also provided that the contribution from the City Council shall be paid in proportionate instalments as each section of the improvement is completed.

Captain Hemphill moved as an amendment that the improvement should only be carried out if the Westminster City Council consented to contribute 18,125*l.*, one-fourth of the cost.

Mr. Dickinson seconded the amendment, and after discussion it was rejected by thirty-nine votes to thirty-four.

The recommendation of the Committee was adopted.

Reconstruction of Warwick-road Bridge.—The Bridges Committee recommended, and it was agreed, that the Council's statutory consent be given to the reconstruction by the Paddington Metropolitan Borough Council of the bridge carrying Warwick-road over the Regent's canal in the manner shown upon the plans presented to the Bridges Committee on May 11, 1904; subject to these being so amended so as to permit of the construction of a conduit tramway over the bridge, and to such necessary minor alterations being made in the plans as may be agreed upon between the chief engineer of the Council and the surveyor of the borough council; and that a contribution be made by the Council, on the usual conditions, of one-third of the net cost of the improvement, provided however that if the total net cost exceeds 8,500*l.*, such contribution shall be limited to 2,834*l.*

Erection of Buildings in Euston-road.—The Building Act Committee brought up a long report in regard to an application of Mr. W. C. Jones on behalf of the Worshipful Company of Skinners for consent to the erection of buildings on the site of Nos. 45-113, Euston-road, to an advanced line. In the course of their report they stated:—"Having regard to the circumstances connected with the Marylebone, Euston and Pentonville roads, to the importance of preserving existing open spaces, and to the immense value to London of a magnificent boulevard 3 miles in length and in most parts nearly 140 ft. in width, such as we hope it may in time be possible to form out of these roads, at a comparatively small cost; if the Council strenuously resists every endeavour to build over the existing forecourts, we are of opinion that it would be very detrimental to the public interest to allow any advance to the building line in the case of the premises Nos. 45-113, Euston-road. In view of the importance of the question, which affects not only the boroughs in which the Marylebone, Euston and Pentonville roads are situated, but the whole of London, and in order to enable the Council to estimate the probable effect of granting the present application, we have given instructions for a cartoon plan of the roads as at present existing to be hung in the Council chamber. We recommend that the resolution of May 3, 1904, refusing the application of Mr. W. C. Jones, on behalf of the Worshipful Company of Skinners, for consent to the erection of buildings on the site of Nos. 45-113 (odd numbers), inclusive, Euston-road, to an advanced line, be adhered to."

Mr. Goldsmith moved, and Dr. Beaton seconded, that the matter be referred back to the Committee, but the motion was defeated, and the Committee's recommendation was carried.

Housing.—The Housing of the Working Classes Committee recommended that the estimate of 4,000*l.*, submitted by the Finance Committee in respect of a proportion of the cost of carrying into effect the London (Norfolk-square, Islington) Improvement Scheme, 1892,

be approved; that the payment of 3,048*l.* 2s. 3d. to the Council of the Metropolitan Borough of Islington as part of the agreed contribution towards the cost of the scheme be authorised; and that it be referred to the Finance Committee to make the payment.

The recommendation was agreed to.
Wenlake-buildings, Roby-street, St. Luke.—**Sub-letting of Contract.**—The same Committee reported as follows:—"The Haslemere Builders, Limited, have asked for sanction to the sub-letting of the gas-fitting work required under their contract for the erection of Wenlake-buildings in Roby-street, St. Luke. We see no objection to the application being granted, subject to the usual conditions, and we accordingly recommend that the Haslemere Builders, Limited, be allowed to sub-let to Messrs. H. Davis & Co. the gas-fitting work under their contract for the erection of Wenlake-buildings in Roby-street, St. Luke, subject to the principal contractors being responsible to the Council for the work being done under the same conditions as if done by themselves."

Mr. Dew moved that the recommendation be referred back on the ground that the firm in question had already sub-let a good deal of the work for the erection of Wenlake-buildings.

The motion, however, was lost.
Mare-street—Paving, etc., Works.—The Improvements Committee recommended, and it was agreed, (a) That the working drawings, bills of quantities, specification and estimate of cost (24,200*l.*) of the paving and other works in connexion with the widening of Mare-street between Dantley-road and the Triangle, authorised by the London County Council (Improvements) Act, 1900, be approved, and be referred to the Works Committee with a view to the work being carried out without the intervention of a contractor; (b) that the employment of a clerk of works in connexion with the works in Mare-street be authorised at a cost not exceeding 250*l.*

Chiswick Drainage.—The Main Drainage Committee recommended, and it was agreed, "That an agreement, on the basis indicated in the foregoing report, be entered into with the Chiswick Urban District Council relative to the reception into the London main drainage system of sewage from certain premises in the urban district; that the solicitor do complete the matter; and that the seal of the Council be affixed to the agreement."

Indication of Houses of Historical Interest.—The Local Government Committee brought up the following report, the recommendation being agreed to:—

"We consider that the residences of Dante Gabriel Rossetti, at 38, Charlotte-street, Portland-place; of Charles Darwin, at 110, Gower-street; of W. M. Thackeray, at 16, Young-street, Kensington; and of Edward Jenner, at No. 14, Hertford-street, W., should be commemorated. We have verified the facts connected with the houses referred to, and have also obtained the necessary consents to the fixing of memorial tablets. We recommend—that the undermentioned houses of historical interest be commemorated by means of memorial tablets: (a) No. 38, Charlotte-street, Portland-place (Dante Gabriel Rossetti); (b) No. 110, Gower-street (Charles Darwin); (c) No. 16, Young-street, Kensington (W. M. Thackeray); and (d) No. 14, Hertford-street, W. (Edward Jenner)."

London Building Acts (Amendment) Bill, 1905.

—The Parliamentary Committee reported as follows:—"We have prepared, in accordance with the instructions of the Council on November 13, 1904, and on the general lines indicated in the report of the Building Act Committee, presented on November 8, 1904, the London Building Acts (Amendment) Bill, which seeks to amend the Acts relating to buildings in London. With regard to the proposed reconstitution of the Tribunal of Appeal, we are unanimously of opinion that it is undesirable to give effect to the Council's resolution."

After consultation with the chief officers concerned, we have satisfied ourselves that the Council's object will be best met if provision is made in the Bill requiring the Tribunal to state their reasons when giving a decision, as the Council is required to do when refusing to sanction the adaptation of ways for streets, and this has accordingly been done. We have given directions for copies of the Bill to be circulated to all the members of the Council, and we also propose to submit the Bill as soon as possible to the various professional bodies and local authorities for their consideration and views."

The Committee recommended:—

"(a) That so much of the resolution of the Council on November 15, 1904 (p. 2,063), as provides for the reconstitution of the Tribunal of Appeal constituted under

the London Building Act, 1894, be rescinded; and that in lieu thereof provision be made in the Bill to amend the London Building Acts whereby the existing Tribunal of Appeal shall be required to state their reasons when giving a decision.

"(b) That the London Building Acts (Amendment) Bill be approved; that the seal of the Council be affixed to a petition for leave to bring in the Bill; and that the Bill and petition be deposited pursuant to the standing orders of Parliament and with such necessary alterations (if any) in the Bill as the Parliamentary Committee may consider desirable."

The Building Act Committee brought up the following special report on the same subject:—

"Our attention has been drawn to the report with regard to this Bill which the Parliamentary Committee will submit to the Council on Tuesday, December 13, 1904. The Council on November 15, 1904, resolved that provision should be made in the Bill.—For increasing the number of members of the Tribunal of Appeal from three to five, for one member to be appointed by the Council, but not to be a member of the Council, and for the fifth to be a barrister of not less than ten years' standing, to be chosen by the other four, and to act as Chairman of the Tribunal; also that no architect or surveyor practising in London shall be eligible for membership of the Tribunal, and that the powers of the Tribunal shall be restricted to the limitations of the section under which the appeal is made. The Parliamentary Committee now propose that instead of the necessary provisions being inserted in the Bill to give effect to the resolution of the Council of November 15, 1904, with regard to the Tribunal of Appeal, the provision should be inserted requiring the Tribunal to state their reasons when giving a decision. The limited time at our disposal does not admit of our putting the matter fully before the Council, but it is of the importance of the question we think it necessary to point out the principal reasons why, in our opinion, the proposal of the Parliamentary Committee should not be adopted. There are some very important matters which, under the London Building Act, 1894, may form the subject of appeal to the Tribunal, but of these the most important are the formation of streets, the general line of buildings in any street, part of a street, place or row of houses, and space at rear of buildings. The decision of the Tribunal on an appeal from the certificate of the superintending architect with regard to the general line of buildings may have a very wide reaching effect and result in a very serious loss to the public of light and air space. Dealing as the Tribunal does with matters of great consequence to the well-being of the general public, it appears to us a matter of the highest importance that its constitution should be such as to inspire the greatest confidence in the impartiality of its decisions. As the Council is aware, section 175 of the London Building Act, 1894, prescribes that the Tribunal shall be constituted as follows—one member appointed by the Secretary of State for the Home Department, one by the Council of the Royal Institute of British Architects, and one by the Surveyors' Institution. It appears to us that a Tribunal consisting of three members, two of whom are appointed by the professional bodies whose interests are closely connected with those of the owners of land and property, cannot be regarded as the best form of Tribunal, and the objections to it are intensified when as is now the case the persons appointed by the professional bodies are architects and surveyors in active practice, whose own work may become the subject of an appeal to the Tribunal, and be adjudicated upon by them in their capacity as members of the Tribunal. We considered several alternative proposals for providing an appeal from the Council's decisions, amongst others, that all appeals should go to a county court judge or judge of the High Court sitting with two professional assessors or advisers or should be settled by arbitration. We came to the conclusion, however, that the most practicable course was to endeavour to remove the chief objections to the present form of constitution of the Tribunal. We quite admit that it may be possible to suggest a better solution of the difficulty, and if the Council adheres to its decision of November 15, 1904, it will, if the Bill goes to a Committee of the House, ensure a full discussion of the subject, and some better arrangement may be the result. We fall to see that the proposal of the Parliamentary Committee will have any useful effect, and as it does not involve any amendment of section 175 of the London Building Act, 1894, its adoption by the Council would, we understand, make it almost impossible to raise the question of the amendment of the constitution of the Tribunal in a Committee of the House. As we are convinced that an absolutely impartial Tribunal of Appeal is essential in the interest of all parties concerned, we have unanimously asked our Chairman to move an amendment to the recommendation of the Parliamentary Committee, and with a view of enabling the Council to judge of the importance of the question, we have had prepared a cartoon showing a portion of the Fulham-road and having marked thereon the general line of buildings as recently defined by the superintending architect and as afterwards defined by the Tribunal of Appeal."

Captain Hemphill, Chairman of the Building Act Committee, said he was disappointed in the attitude of the Parliamentary Committee. The Building Act Committee had had an analysis made of every case which had been before the Tribunal of Appeal, and they had very much fuller information on the subject than the Parliamentary Committee, and in every case dealing with lines of frontage, where an appeal had been made to the Tribunal the line of approach had been advanced. The sole motive which seemed to have guided the Tribunal was to benefit the owners of property. The Committee did not think it a proper thing that men who had to decide questions of lines of frontage while sitting as the Tribunal should be men who were interested in such questions professionally while not sitting on the Tribunal, and for that reason the Committee thought that members of the Tribunal should not be composed of gentlemen who were practising in London, and who were more or less interested

in such work. He, therefore, opposed recommendation (a).

Dr. Napier, Chairman of the Parliamentary Committee, said that the action of his Committee was in order to lighten the opposition to the Bill. The Bill, which had not been submitted to the professional or local authorities of London, would be bitterly opposed, and it was no good putting in needlessly aggressive clauses. It would be possible to bring in a small Bill next year dealing with this point if thought desirable.

The question was then put, recommendation (a) being defeated, and (b) being agreed to.

London Squares.—The Parliamentary Committee recommended that the London Squares and Enclosures (Preservation) Bill, 1905, be approved. The measure seeks to secure that the garden squares and enclosures in London shall be permanently preserved as such, and that such squares and enclosures when so preserved shall be free from any future legislation relating to the taxation of ground or site values. The Bill, while prohibiting the erection of buildings on the scheduled land and exempting the lands from assessment and rating on the basis of site values, also includes provisions (a) to enable the Council to make agreements with the owners of any of the scheduled lands with respect to the maintenance thereof, the erection of buildings thereon, and generally as to the preservation of such lands in their present state; (b) to empower the owners to require the Council to take over and maintain for the public squares and enclosures in cases where the owners desire to be relieved of the cost of maintenance; and (c) to enable owners in the rearrangement of their estates to utilise a portion of their garden squares or enclosures, should they desire to do so, on condition that an equivalent area of open space to the satisfaction of the Council is provided. These two latter provisions have been inserted at the suggestion of the Chancellor of the Exchequer and the Commissioners of Woods, who, on behalf of the Crown, have expressed their willingness that Bessborough-gardens, Clarence-gardens, and Munster-square should be placed in the schedule to the Bill. The Committee further stated that they proposed to send a copy of the Bill, together with the schedule containing all the garden squares and enclosures in London, to each of the owners whose squares or enclosures were comprised therein, with an intimation that, if after the introduction of the Bill and before the committee stage in the first House, they expressed to the Council their wish that their squares and enclosures should be withdrawn from the compulsory provisions of the Bill, the Council would, with regret, comply with such request. They were strongly of opinion that by adopting a conciliatory attitude they were most likely to gain the sympathy of the landowners concerned, and they trusted that, as the result of further negotiations, the Bill might result in securing the permanent preservation of many London squares and enclosures.

Lord Ludlow said that he had from the beginning taken a keen interest in this movement and had either personally or by letter approached the great ground landlords of London, with the result that a large number of them had expressed their sympathy with the Bill, and the owners of seventeen squares had consented to have their property scheduled to the Bill. There was every reason to believe that a great many more would come in. In the Edwardes-square (Preservation) Bill of last Session Mr. Dickinson wanted to make the measure compulsory; it was in fact a confiscatory Bill, and anything in that way he (Lord Ludlow) would oppose as strongly as he was supporting the present Bill.

Mr. Dickinson said that no one recognised more than he did the well-intentioned services of Lord Ludlow in this matter, but he contended that this was clearly a case in which some measure of compulsion was necessary. The present state of affairs was an abuse of the power of the landlord interest against the public interest. If they did not have a compulsory Bill they might save certain of the squares owned by high-spirited and municipally patriotic landlords, but they would not save the very squares they were most anxious to preserve, those which were on the point of being sold for building purposes. At any rate he thought that they might leave the door open for a compulsory measure, and he accordingly moved as an amendment to add to the recommendation the words "provided that the

Council do report further to the Council before accepting the squares or enclosures of any particular ground landlords." In that way they would discover in time who were willing to come in and whether a compulsory measure was necessary.

Mr. Jackson seconded the amendment. Mr. Burns, M.P., supported the Bill. He pointed out that theoretically he was in favour of the nationalisation of the land, but this was a matter of expediency, and he was anxious to save the squares. It would be nothing short of a calamity if they lost the 412 London squares through a mistaken policy.

The amendment was rejected on a show of hands.

The Bill was then approved. The Council adjourned soon after eight o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

- Lines of Frontage and Projections.**
- Lewisham.**—Six buildings on a site abutting upon the west side of Perry-hill and south side of Vancouver-road, Catford (Mr. S. C. Hart for Messrs. E. Clarke & H. Kerwen).—Consent.
- Lewisham.**—A building on a site abutting upon the east side of High-street, and north side of Limes-grove, Lewisham (Messrs. Owen & Ward for Mr. W. Stephens).—Consent.
- Hackney.**—An iron and glass porch at No. 12, Lower Clapton-road, Hackney (Mr. F. H. Coles for Dr. F. P. Bremner).—Consent.
- Lambeth, North.**—A boiler-house at St. Thomas's Hospital, Lambeth Palace-road, Lambeth (Mr. P. Curry).—Consent.
- Lambeth, North.**—Removal of existing covered way at the entrance to block No. 1 of St. Thomas's Hospital, fronting upon Westminster Bridge-road, Lambeth, from one position to another.—Consent.
- Fulham.**—A porch and balcony at No. 77, Ellerby-street, Fulham (Mr. J. Coleman).—Consent.
- Fulham.**—Projecting arches between the bay windows of two blocks of flats on the west side of Vera-road, Fulham (Mr. H. G. Braze for Mr. A. L. Horlock).—Consent.
- Hampstead.**—A deviation from the plans approved for the erection of additions to All Souls' Church, Loudoun-road, Hampstead (Messrs. Nicholson & Corleite).—Consent.
- Hampstead.**—Three blocks of working-class dwellings upon a site abutting upon the east side of Upper Park-road and north side of Lower Cross-road, Hampstead (Mr. O. B. Winter for the Council of the Metropolitan Borough of Hampstead).—Consent.
- Hampstead.**—A conservatory at No. 48, Frogual, Hampstead, to abut upon Arkwright-road (Mr. F. S. Hammond for Mr. R. Hart).—Consent.
- Hampstead.**—Three houses upon the west side of Roscroft-avenue, abutting also upon the north side of Hollycroft-avenue (Mr. W. J. King).—Consent.
- Marylebone, East.**—A porch at No. 38, Finchley-road, St. Marylebone (Messrs. Anseombe & Ringland for Mrs. Lupton).—Consent.
- Paddington, South.**—An oriel window at the ground-floor level of No. 62, Oxford-terrace, Paddington (Messrs. Carr & Parr).—Consent.
- St. George's, Hanover-square.**—A verandah at the first-floor level of No. 10, Berkeley-square, St. George's, Hanover-square (Messrs. Woodrow & Haldson for Messrs. J. Andrews & Sons).—Consent.
- St. George-in-the-East.**—Projecting lamps at St. John's and King Henry's wharves, High-street and Dundee-street, Wapping (Messrs. R. G. Hall & Co.).—Consent.
- Wandsworth.**—Four dwelling-houses on the north-western side of Church-lane, Tooting, westward of Lucien-road (Messrs. Nash & Lillywhite).—Consent.
- Dulwich.**—Buildings on the south side of Barry-road, Dulwich, abutting also upon Lordship-lane (Messrs. Harrington & Ley for Mr. J. Redapple).—Refused.
- Lewisham.**—A block of residential flats at No. 155, High-street, Lewisham, of bay-windows and balconies overhanging a roadway leading out of the southern side of High-street (Mr. C. A. Ceep).—Refused.
- Marylebone, East.**—Buildings upon a site abutting upon the northern side of Albert-road, eastern side of Avenue-road, and southern side of St. Edmund's-terrace, St. Marylebone (Mr. A. F. Faulkner for Mr. W. Willett).—Refused.

Stepney.—A projecting hood over the entrance to "Carr House," Holloway-street, Commercial-road. Steptoe (Messrs. Joseph & Smith) for the Council of the United Synagogue.—Refused.

Wandsworth.—A house on the north side of Hazlewell-road, Putney, to abut upon Campion-street (Mr. J. C. Radford for Mr. A. E. Pierce).—Refused.

Width of Way, Lines of Frontage, and Construction.

City.—A deviation from the plans approved for the erection of an open iron and concrete gangway across Water-street, City, so far as relates to an alteration in the position of such gangway (Messrs. Cheston & Perkin). Consent.

Width of Way and Lines of Frontage.

Lewisham.—A building upon a site abutting upon the northern side of Ewart-road and the western side of Garthorne-road, Forest Hill, with a forecourt fence at less than the prescribed distance (Mr. G. Dunsmore for Messrs. Dunsmore Brothers).—Consent.

Midle End.—The retention of a two-story addition erected at the rear of No. 32, Trodegar-square, abutting upon College-street, Mile End, with external walls at less than the prescribed distance from the centre of the roadway of College-street (Mr. J. M. Knight for the Guardians of the Hamlet of Mile End Old Town).—Consent.

Lewisham.—One-story buildings on the western side of Perry-vale, Lewisham, adjoining Forest Hill Railway Station (Messrs. F. Chambers & Son).—Refused.

Lines of Frontage and Construction.

Marylebone, West.—A one-story wooden office building on part of the forecourt of No. 498, Edgware-road, St. Marylebone (Messrs. D. C. Martin & Son).—Refused.

Conversion of Building.

Strand.—The adaptation of St. Clement Dane's Schools, Stanhope-street and Kingsway, for the purposes of a common lodging-house (Mr. O. Archer for the Salvation Army).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—At a meeting held on the 13th inst., Mr. Chas. Cole in the chair, the hon. secretary opened a discussion on "The ownership of Drawings as Affected by Recent Cases." He reviewed these decisions, and referred to the clearly put article in the *Builder* of November 26, also quoting the report of Elyd v. McGowan, which really only dealt with one phase of the question—viz. : (a) that for plans of works partly carried out by the architect but finished without him, and which may in this case have necessitated the handing over of the plans; but such a ruling is quite on another footing when applied to (b) plans for works not carried out; (c) plans for works carried out by the architect; (d) plans for works carried out by the client without the architect's supervision. The latitude of the Surveyors' Institution and that of the R.I.B.A. having been contrasted, as well as a compliment paid to the *Builder* for the stand it is taking, an interesting discussion followed, leading up to a resolution that, as it is the custom of architects in this locality to retain the drawings, the attention of the R.I.B.A. be drawn to this important matter, and that the Board of Professional Defence be asked to take steps to obtain another pronouncement on this question.

LIVERPOOL ARCHITECTURAL SOCIETY.—A meeting of this Society was held in the Law Library, Castle-street, on the 5th inst., Mr. P. Thicknesse in the chair. Messrs. Sydney Maddock, of Frodsbam, and D. H. Richards, of Birkenhead, were elected associates. Afterwards, Mr. Maurice B. Adams, F.R.I.B.A., read a paper on "Modern Libraries." He pointed out that the value of public libraries as an adjunct to education was not yet realised in this country as was the case in America. Libraries were crippled by the limit of the penny rate, fixed when the movement was an experiment. This limit led to inefficiency and waste. On the whole, he advocated State aid for libraries as part of the education grant. Every class should be catered for. It would increase the usefulness of libraries if the Cardiff system was more generally adopted. In Cardiff they had juvenile reading-rooms and school lending libraries, and lectures and classes on the use and value of books, as well as special lectures for adults and artisans. Mr. Adams insisted

that architecturally libraries should be among the best features of a town.

MANCHESTER SOCIETY OF ARCHITECTS.—At a meeting of the Manchester Society of Architects, held in the Chartered Accountants' Hall on the 8th inst., Mr. E. T. Hall, of London, gave a lecture on "Hospital Design and Construction." Starting with the canon that architectural treatment must always be subordinated to the fundamental objects of a hospital, Mr. Hall spoke of the importance of providing the maximum of sunlight and the best possible system of ventilation. The hospitals of the XVIIIth century were, he said, often a great danger to the patients. For instance, the Hôtel Dieu in Paris contained from 700 to 1,000 patients in one ward, and the beds were made to accommodate four patients each, and often had to hold six. Some 5,000 patients were banded on a site of three acres, which allowed only 30 ft. per patient. It was not surprising to hear that the mortality in the Hôtel Dieu of the XVIIIth century was as high as 22 per cent. Mr. Hall traced the gradual evolution of hospital construction, and pointed out that our modern hospitals have an area thirty times as large, and our modern fever hospitals an area from sixty to a hundred times as large, per patient as that provided in the old Hôtel Dieu.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of this Society was held on the 8th inst. in the lecture hall of the Literary and Philosophical Society, Leopold-street, when a lecture was given by Mr. E. M. Gibbs on "Architecture in Eastern Europe." The lecturer said it was not a critical essay he had to deliver, but only a number of views of buildings taken or purchased by him on an eighteen days' cruise in the Mediterranean, with a few odd days on shore, visiting Taormina, Constantinople, Smyrna, Ephesus, Athens, Corinth, Mycene, and Tiryns. As the antiquity of the architecture he had to illustrate was almost in reverse order to that in which the cities were visited, he commenced with Tiryns and concluded with Constantinople. Tiryns was shown by limelight to be a shapeless ruin of unwhewn stones without mortar. Mycene, the lecturer said, was of nearly equal early date, and Cyclopean. The huge stone beam to the Lion Gate was relieved of weight by the corbelling over it, and the triangular space filled with sculpture. The tomb of Agamemnon was shown, as also was a portion of the surrounding circular wall, within which are five towers, the gold and other ornaments of which, the lecturer said, filled many cases in the Athens Museum. The tomb of Queen Klytemnestra, which was shaped inside like a beehive, had all the roof built in horizontal courses of stone, and showed that the radiating joints of domes had not then been invented. It had partly fallen in consequence. The Corinth of Apostolic times was now a mere hamlet, and contained nothing much of interest except a few columns of the Temple and a bath. The modern canal across the isthmus was a great engineering work $\frac{3}{4}$ miles long, with water 100 ft. wide and 26 ft. deep. Athens was so pre-eminently beautiful and interesting that the lecturer could not refrain from devoting a large number of slides to it, but no slides could convey any idea of the beauty of the combination of blue sky, fine hills, and white marble buildings stained with age, and of the most perfect architecture. Some snapshots of architectural fragments interesting to students were also shown. Mr. Gibbs said the Stadium had recently been restored at the cost of a Greek merchant; it had a course about 100 ft. longer than Bramall-lane, and had seats in white marble on three sides raised in sixty tiers, so as to hold 50,000 people. It was formed out of a natural valley. Views of modern buildings in Athens showed how excellently the architects worked in the ancient style. The views of Ephesus were limited to a few snapshots taken during a visit which was shamefully hurried by the guides, considering its great historical interest and its immense wealth of Grecian-Roman remains. One view showed a street nearly a mile long, all of white marble, with the remains of columns down each side, and out of this street opened many public buildings, and it led up to the great theatre, which seated 24,500. The remains of the Temple of Diana are now in a great hollow and difficult of access because of water; the best of the work is to be seen in the British Museum. The excavations of the city are being rapidly proceeded with, and any traveller to the east should visit Ephesus. The ruins show in what

magnificence and beauty the old Greeks and Romans loved to dwell, and made the lecturer desire that the time should come when a rich nation like the English might in like way more fully appreciate noble architecture. Views were shown of Constantinople, and of its mosques, fountains, palaces, bazaars, and streets. The wealth and beauty of the marble and mosaic decoration of S. Sophia were equalled by its wonderful arched and domed construction, which has stood the test of earthquakes for 1367 years; it was over 900 years old when it came into possession of the Turks, and they have preserved it almost intact, with the exception of obliterating the figures of saints. It was also remarkable that the mosques built by the Turks in Constantinople so very many years afterwards were all adaptations of the general arrangement of S. Sophia. The museum contained some twenty-one sarcophagi discovered in 1887 in Siron. Two of them were illustrated, the one called the Tomb of Alexander being evidently of that period of Greek art; it was of white marble, and was sculptured on all sides. The other tomb was called The Weepers, because of the figures all around it. The marble shows traces of vivid colouring. The bazaars dated from the time of Constantine, and were very interesting. The fountains were wholly Turkish work. On the motion of Mr. J. Smith, seconded by Mr. W. J. Hale, and supported by Messrs. A. Howe and Horace Wilson, a hearty vote of thanks was accorded Mr. Gibbs for his lecture, which was illustrated by lantern slides exhibited by Mr. J. Atkinson, of University College. On the motion of Mr. E. M. Gibbs, seconded by Mr. J. Smith, and supported by the President (Mr. T. Winder), a resolution was unanimously carried expressing satisfaction, and congratulating the hon. secretary (Mr. W. C. Fenton) on his appointment as chairman of the School of Art managers.

ROYAL INSTITUTE OF ARCHITECTS OF IRELAND.

—The Annual General Meeting of the Royal Institute of the Architects of Ireland was held on the 8th inst., at Lincoln-place, Mr. William M. Mitchell, President, in the chair. The President, in the course of his address, said that the Government had treated the profession in Ireland very unfairly by appointing an English architect to design the new College of Science, and the appointment was taken to mean that the Government did not consider any Irishman qualified for the post. They need not be surprised, therefore, if public bodies, as well as private individuals, acted similarly to the Government. Referring to the proposal of the Ulster Society to reduce the scale of fees for certain buildings, he greatly feared the tendency may be to lower the commission on all buildings whatsoever to the reduced scale. He said that the recent appointment of a Board of Architectural Education in order to promote a uniform system throughout the United Kingdom, would do much for their young architects, and properly equip them for their profession. He stated that a Registration Bill for Architects would help to solve the system of education, and since their last meeting much progress had been made in that direction. The allied societies were deliberating on the subject of registration, and would shortly issue their report. The object was an excellent one, and would prevent unqualified persons from assuming the title of architect. In conclusion, the President stated they should become fully equipped by scientific study and training to adapt their methods to any problems which might confront them in the future.—The annual report was then read, in which regret was expressed that the budding trade was still in a depressed condition owing to the difficulty in raising invested money. As to the proposed reduced scale of fees by the Ulster Society, the council expressed its disapproval of any change which would go to alter the standard commission. The memorial deprecating the employment of municipal officers to carry out important works in urban districts was supported by the council, which had asked the Dublin Corporation to receive a deputation on the subject. Dealing with the appointment of an English architect for the new College of Science, the report regrets and strongly deprecates the action of the Government, which professes to have the betterment of Ireland at heart. It also regrets the increasing tendency to bring over English and Scotch architects whenever occasion offers. Mr. A. E. Murray proposed, and Mr. G. C. Ashlin seconded, the report, which was unanimously adopted. The hon. treasurer's report was also adopted. The

following council was elected for the ensuing year:—Messrs. Sir Thomas Drew, G. C. Ashlin, C. J. McCarthy, G. Sheridan, Frederick Batchelor, C. A. Owen, W. Kaye Parry, A. E. Murray, and W. H. Hill. Messrs. J. Rawson Carroll and F. G. Hicks were elected as hon. auditors.—The annual dinner of the Institute was held in the evening at the Shelbourne Hotel. Mr. William Mitchell, P.I.A.L., presided. The loyal toasts having been honoured, the President proposed the toast of "The Royal Institute of Architects of Ireland." He said that the Institute had attained quite a respectable age, having been founded in 1859. The body, he was glad to say, was progressing with encouraging rapidity, and had now reached a position and a state of prosperity to which it had never previously attained. It comprehended in its membership pretty well all the qualified architects in Ireland. The toast "Our Guests" was next given by the President, and the Dean of St. Patrick's, in responding, referred to the work of the architects of Ireland. Those who had been in Dublin felt that they owed a great debt of praise to the members of the architectural profession for the treasures with which they had enriched the city. Dr. Smyly, President of the College of Physicians, also responded, and paid a high tribute to the work of the architects in connexion with the Dublin hospitals. Mr. Chance, President Royal College of Surgeons, Mr. Laurence Waldron, M.P., Mr. Cochrane, President Civil Engineers Institution of Ireland, Mr. James Beckett, President of the Master Builders' Association, and Mr. Webb, President Architectural Association, also responded.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—The Fiftieth Annual General Meeting of the Society of Engineers was held on Monday, the 12th inst., at the offices of the Society, 17, Victoria-street, Westminster, Mr. D. B. Butler, President, in the chair. The following gentlemen were duly elected by ballot as the Council and officers for 1905, viz.:—As President, Mr. Nicholas James West; as Vice-Presidents, Messrs. Maurice Wilson, Richard St. George Moore, and Joseph William Wilson; as Ordinary Members of Council, Messrs. Joseph Bernays, George Abraham Goodwin, George Green, William Henry Holtum, Edward John Silcock, Diego Andrew Symons, John Aird, and Alexander Graham Drury; as Honorary Secretary and Treasurer, Mr. George Burt; as Honorary Auditor, Mr. Samuel Wood, F.C.A. The President announced that the following Premiums had been awarded by the Council for papers read during the past session, viz.:—The President's Gold Medal to Mr. William Edward Storey for his paper on "Condensing Machinery"; the Bessemer Premium of Books to Mr. R. G. Allanson-Winn for his paper on "Deep Sea Erosion and Foreshore Protection"; a Society's Premium of Books to Mr. A. S. E. Ackermann for his paper on "British and American Coal-cutting Machines"; and a Society's Premium of Books to Mr. Frank Latbam for his paper on "Some Recent Works of Water Supply at Penzance."

THE INSTITUTION OF CIVIL ENGINEERS.—At the Ordinary Meeting on the 13th inst., Sir Guilford L. Molesworth, K.C.I.E., President, in the chair, a paper "On the Construction of a Concrete Railway-Viaduct," by Mr. A. Wood-Hill, Assoc. M.Inst.C.E., and Mr. E. D. Pain, Stud. Inst.C.E., was read. The following is an abstract of the paper:—The viaduct in question is situated at Cannington, on the Axminster and Lyme Regis Light Railway, which now connects Lyme Regis with the Yeovil and Exeter line of the London and South-Western Railway. It consists of ten elliptical arches of 50 ft. span, its total length being 600 ft., width over spandrels 16 ft., maximum height to rail-level 92 ft., and gradient 1 in 80. It affords an example of the recent application of concrete to viaduct construction, and to arches of somewhat large span. With the exception of the concrete blocks in the vertical faces of the arches, the work throughout is mass concrete. The geological strata are greensand and blue clay. The foundations, originally designed for a pressure of 3½ tons per square foot, were enlarged to give pressures ranging from 1½ ton to 3 tons per square foot. The concrete used consisted of crushed flints and Portland cement, the crushing yielding sufficient grit to make the addition of sand unnecessary except in special cases. The concrete was hand-mixed, and for

transporting this and other materials a cable way of 1,000 ft. span was erected across the valley, the piers being built without scaffolding. The piers were carried up in rectangular lifts of diminishing size, instead of having a continuous hatter, the lifts being 6 ft. deep. The concrete was deposited in wooden boxes of this depth, which were bolted up on the ground and hoisted into position. The mode of filling and striking the boxes, of which there are eleven, is described. The work in all the piers was advanced as far as possible at the same rate. Two rows of corbels were built in the top lift of the piers, to support the arch-centring. This consisted of four-built ribs, the centre portion of which was tied by a framework, in the form of a Warren girder, supported in the middle by raking struts from the lower row of corbels. The ribs, including the lattice-work, were set in one piece, and four tie-bolts were placed in the span to assist the piers in taking the thrust. The faces of the arches were built in concrete blocks, of which two similar ones on opposite sides of the viaduct were set simultaneously by a rail attachment to the cableway; and by adjusting the chains attaching the blocks the latter were suspended at the angles required by their position in the arch. The blocks were keyed in advance of the mass concrete, in order that the adhesion of the latter to the toothing of the blocks might relieve the centres of some of the weight. Expansion joints were formed through the arches, spandrels and parapets, and are found effective in giving play for expansion and contraction, and any slight movement due to settlement. In turning the arches, the centring, although apparently light, was found to be sufficiently rigid, and the setting was facilitated by the ribs being made in one piece. The settlement of the piers was for the most part fairly even, and, being adjusted as the work proceeded, did not affect the concrete; but the settlement of the west abutment and first pier was greater than elsewhere, and crushed the crown of the first arch. Two diaphragm-walls were built in brickwork in cement in the third span, to enable it to act as an abutment, and concrete needles were built in the embankment between the first and second piers; the crushed portion of the first arch was cut out and made good in brickwork, and the parapets over this arch were completed. Particulars are given of the cost of the viaduct, and a schedule is appended of the results of tests of sample blocks made from materials used in the concrete. The authors believe this is the first instance in which piers of a similar height have been built without scaffolding, and in which the centres of a 50-ft. arch have been designed for setting in one piece.

COMPETITIONS.

MEMORIAL TO SIR HECTOR MACDONALD.—On the 7th inst. the sub-committee for this memorial met to make a final selection from three designs which had been specially set apart for consideration, and selected that under the motto "Gael," by Mr. James S. Kay, Skirving-street, Shawlands. 150 drawings and 12 models had been sent in, from which 10 were first selected for special consideration, which were afterwards reduced to three for final selection. The other two were "Kudos," by Mr. E. C. H. Maidman (Edinburgh), and "Duty," by Messrs. Macdonald & Currie (Glasgow). The monument is to be erected on the "Green Hill," Dingwall. It will be in the form of a square mediæval keep or tower in the old Scottish Baronial style of architecture. It is proposed to use the ground floor as a small museum.

WESLEYAN METHODIST HALL, WESTMINSTER.—Sir Aston Webb has issued his report on this important competition. He states that there has been a very good response to the invitation, and does not consider that the trustees will have any necessity to exercise the right they reserved to invite final designs from architects other than the original competitors; instead of doing that he would advise them to invite the authors of nine of the designs to take part in the final competition, receiving a fee of 100 guineas each on satisfying the conditions. The authors of the nine designs recommended are:—Messrs. Crouch, Butler, & Savago (Birmingham); Messrs. Lanchester & Rickards; Messrs. Cheston & Perkin; Messrs. Waddington Son & Dunkley; Mr. James S. Gibson; Mr. James A. Swan (Birmingham); Mr. E. Vincent

Harris; Mr. W. Flockhart; and Messrs. C. E. Mall and A. W. S. Cross: all of London except where otherwise stated.

BOOKS RECEIVED.

THE ARCHITECTS' LAW REPORTS, Vol. I. Compiled by Arthur Crow, F.R.I.B.A. (18, Great Prescot-street, London. 5s.)

LIVES OF THE ENGINEERS (Vermuyden)—Myddleton—Perry—James Brindley. By Samuel Smiles. (John Murray.)

LOCKS AND BUILDERS' HARDWARE: (a hand-book for Architects). By Henry R. Towne. (Chapman & Hall.)

TECHNOLOGICAL AND SCIENTIFIC DICTIONARY. Part VII. (Geo. Newnes. 1s.)

KNOTTING AND SPLICING ROPES AND CORDAGE. Edited by Paul N. Hasluck. (Cassell & Co. 1s.)

Correspondence.

THE GAS EXHIBITION.

SIR,—We notice in your issue of December 10, pages 601-2, you make reference to dynamos and arc lamps exhibited on the stand of Messrs. P. Simon & Co. We would like to point out that these dynamos and arc lamps are of our manufacture, and, in addition to supplying light for the stand and showing the possibilities of gas engines driving electrical plants, they were used for supplying power to various electric motors in use on many of the stands in the exhibition.

JOHNSON & PHILLIPS.

REINFORCED CONCRETE.

SIR,—Referring to the report in your issue of the 10th inst. of the discussion on "Reinforced Concrete" at the meeting of the R.I.B.A., I see that Mr. E. Robins claims to have taken out the first patent for armoured concrete in 1869. I am afraid that he is mistaken in supposing that his patent was the first. The late principal of this firm, who was the pioneer of *in situ* granite concrete paving, patented a reinforced concrete floor on October 27, 1854, using wire ropes suspended (as sketch*) for the tensional reinforcement.

It is interesting also to note that Mr. Wilkinson took out a patent two years later for hollow tubular plaster partitions, which, except that they were ¼ in. thick, were identical with the general construction of many of the present-day partitions.

For W. B. WILKINSON & Co., LTD.,

HUBERT TODD, London Manager.

* The diagram was sent too late for reproducing.

METROPOLITAN ASYLUMS BOARD.

The usual fortnightly meeting of the Managers of the Metropolitan Asylums Board was held at the offices, Victoria Embankment, on Saturday last week.

Twining Be Asylum.—Among the correspondence received was a communication from the Local Government Board approving of the plans of the additional blocks to be erected at this asylum, at a cost estimated at 36,250l.

Belmont Asylum.—It was agreed to apply to the Local Government Board for their sanction to the Managers inviting tenders for wiring the Belmont Asylum for electric lighting purposes from six selected firms, and entering into a contract or contracts for the execution of the necessary works, without, in the first instance, advertising for sealed tenders.

Brook Hospital.—A scheme for providing additional means of access to the subways of this hospital, at a cost of some 375l., was approved.

Offices of the Board.—It was reported that the total cost of completion of this building had been 57,230l. 6s. 2d.; slightly under the amount authorised by the Local Government Board.

Emergency Works.—It was agreed (the resolution applying to all institutions) that, except in cases of emergency (which shall be forthwith reported to the Clerk to the Board), no work which shall involve alteration or repairs to any drain, gas or water pipes, boilers, machinery, electric light installation, or lighting conductor, be authorised until the same shall have been reported on by the Engineer-in-charge, and any work so authorised shall be carried out under his supervision.

The Board of Unemployed.—The Clerk read a letter from the London Unemployed Fund asking whether the Board could assist them in any way in providing work for the unemployed. The Clerk had replied that the Board possessed no land whatever that would give work to the unemployed. The letter was referred to the Works Committee. A

supplemental report by the Works Committee, submitting for acceptance a tender by Messrs. W. H. Wheeler, of Blackfriars, for the execution of certain street works at Joyce Green Hospital, produced some discussion, and a motion to refer back was lost. Several Managers considered that the work should be taken in hand by direct labour, so that some of the unemployed of London might be benefited, but ultimately the Committee's recommendation was agreed to.

The Student's Column.

ASPHALT: ITS COMPOSITION AND PROPERTIES.—II.

NATURAL ASPHALT.

HE advocates of natural asphalt contend that the "mixed bitumens" are only to be found pure in the rock which they have permeated when in a state of vapour and under enormous pressure. Dr. H. Lotz, after examining the Ragusa deposits in Sicily, states quite recently that, like other bituminous deposits described by Messrs. Malo and Delano, they are the result of the sublimation or upward percolation through fissures of gaseous or liquid hydrocarbons. The bitumen in the Sicilian and Seyssel rocks is solid and tough, whilst that contained in Val de Travers is soily; and the tendency of the latter to creep under heat and rolling contact may be corrected by a judicious blending with the former or better, by the admixture of a percentage of old with new. The "total bitumen" may be separated from the pulverised rock by dissolving it in carbon bisulphide, and its percentage composition has been found analogous to that of indiarubber having the same hydrocarbons for its ingredients.

The molecules of natural asphalt are held together, not by cohesion—which, as it existed in the carbonate of lime, has been destroyed by the interpenetration of hydrocarbon vapour—but by agglutination, the test being to heat a small piece on an iron plate, when it will fall to pieces. The unimpregnated limestone found in an asphalt mine will not crumble on being pressed.

To test its compressibility a small press with moulds or a tube with a plug and hammer may be used. Imperfect asphalts, after being subjected to a pressure of 6 tons per sq. in. in a closed space, will afterwards crumble under pressure of the fingers.

The percentage relation of "total bitumen" to limestone or sandstone, as the case may be, is shown for various types in Table I. from data furnished by Mr. Delano.

The writer has compiled the table in three sections, Nos. 1 to 7 being natural asphalts,

having a limestone basis in all cases except No. 3, where sand predominates; Nos. 8 and 9 of Bastennes bitumen, and a mixture thereof with Seyssel rock (this bitumen is now exhausted); and Nos. 10 and 11 of gas-tar and the mixture thereof with ground fireclay and chalk to make an artificial asphalt. Of the first section, No. 6 represents Forens, with a low percentage of bitumen, No. 2 with high bitumen content but abnormal in iron and sulphur, whilst Nos. 1, 4, and 5 show what are still regarded as standard materials. Each section is comparable within itself, but it is not intended that the three sections of the table should be wholly comparable with each other, because the basis of computation is necessarily different, the bitumen or gas-tar being employed always in conjunction with some inorganic base. M. Durand Clave devised a quantitative method for enabling natural bitumens to be distinguished from the products of coal-tar by a comparison of the colour which the extracts assumed under various reagents, but as this technically belongs more to the domain of the chemist, and it has also been followed by a more complete differentiation, no further details need be given.

The following analysis recently made at the laboratory of the Imperial Institute shows a fuller statement as to the nature of the bituminous content, and at the same time gives information respecting a deposit of asphalt rock in the Island of Bahrein, Persian Gulf, within the area of the Geological Survey of India.

On heating in a crucible it yielded moisture 0.59; volatile matter 17.47; fixed carbon 5.30; and ash 76.63 per cent. The amount of bitumen contained in the asphalt rock was determined by extraction, first with acetone to remove the liquid bituminous matter (called "petroleum"), and subsequently with chloroform, which dissolves out the solid bitumen (called "asphaltene"); with the following results:—

Matter soluble in acetone	Per cent. 10.47
Matter soluble in chloroform	7.20
Total bituminous matter	17.67

This comparatively high content was associated with a mixed base, in which siliceous constituents are predominant. The following is its percentage composition as shown by the ash, after driving off the carbonic acid from the limestone:—

Silica (SiO ₂)	66.24
Alumina (Al ₂ O ₃)	9.54
Ferric Oxide (Fe ₂ O ₃)	2.31
Lime (CaO)	15.78
Magnesia (MgO)	2.22
Soda and potash	3.85

TABLE I.—COMPOSITION OF ASPHALT ROCKS, ETC.

Number of Specimen	Composition of Asphalt Rocks, etc.										
	1	2	3	4	5	6	7	8	9	10	11
Place and District of Origin	Val de Travers, Switzerland	Lithman, Alsace	Maritima, Spith	Ragusa, Sicily	Seyssel, France	Forens, Department of the Alps	Chianti, Italy	Recent natural bitumen (D. of Landes)	Seyssel melted with No. 8.	Gas Tar.	Imitation Asphalt.
Water and volatile matter at 100° centigrade	0.35	3.40	0.40	0.80	0.40	0.25	0.35	0.30	0.15	0.05	0.60
Bitumen, matters soluble in bisulphide of carbon	8.70	11.90	8.80	8.85	9.10	2.25	7.75	69.35	14.05	65.70	20.65
Bitumen matter, not soluble, but combustible	—	—	—	—	—	—	—	4.50	—	33.00	18.45
Inorganic matter as below	90.95	84.70	90.80	90.35	90.50	97.50	91.90	25.85	85.80	1.25	60.33
Residue insoluble in acids	—	—	—	—	0.10	0.05	0.40	20.35	4.55	—	18.05
Alumina and peroxide of iron	0.30	1.25	4.35	0.90	0.05	0.15	0.25	2.85	0.85	—	2.65
Lime	49.50	38.90	57.10	49.10	50.50	54.95	50.45	0.70	45.00	1.25	22.20
Magnesia	0.10	0.15	3.85	0.45	0.05	0.10	0.70	0.10	0.05	—	a trace
Sand	0.60	3.05	57.40	0.60	—	—	—	—	—	—	—
Pine or combined silicate	—	—	11.35	—	—	—	—	—	—	—	—
Carbonic acid and waste	40.16	31.92	8.15	39.40	39.80	42.85	40.10	1.85	35.35	—	17.40
Sulphur	0.08	4.99	—	—	—	—	—	—	—	—	—
Iron combined with sulphur	0.21	4.44	—	—	—	—	—	—	—	—	—

The above analyses were made under the direction of M. Durand Clave, Engineer-in-Chief and Director of the Laboratory of "Ecole des Ponts et Chaussées," Paris, who makes the following notes:—
 Sample No. 1 is an almost pure limestone impregnated with bitumen. It is a true asphalt.
 Sample No. 4 is an asphalt almost absolutely pure.
 Sample No. 2 is an asphalt, but the iron pyrites, amounting to 9.43 (iron and sulphur), may give rise to oxidation and consequent disintegration after a time.
 Sample No. 3 is a siliceous rock, somewhat argillaceous and impregnated with bitumen.

To make it suitable for paving, 70 per cent. of powdered calcite or limestone should be added so as to have a finished product containing not more than 10 per cent. of bitumen, and consolidating by heat and pressure into a compact and impermeable roadway.

OBITUARY.

MR. RICHARD MAWSON.—The death of Mr. Richard Mawson, of the firm of Messrs. Mawson & Hudson, architects, of Bradford, takes our recollections back to the days of Gothic, when the firm of Lockwood & Mawson was prominent in competitions for town halls and other large buildings in the revived Gothic style. Mr. Mawson was the son of a printer in Leeds, and was taken into partnership with Mr. Lockwood at an early age, a circumstance which indicates that he was recognised as a young architect of special talent. The firm were, as is well known, the architects of the Bradford Town Hall, besides many other large and important buildings. Mr. Mawson was seventy at the time of his death.

GENERAL BUILDING NEWS.

BAPTIST CHURCH, BEVERLEY-ROAD, HULL.—The foundation-stone of this church was laid on the 7th inst. The church, which will accommodate over 1,000 persons, mostly on the ground floor, is designed in a late period of Gothic, a bold square tower being the feature at the corner of the site. The contract amount for the church, five vestries, large church parlour, cloakrooms, etc., is 5,500l. The architects are Messrs. George Baines & R. Palmer Baines, Clements-street, Strand, London, W.C.

BAPTIST CHURCH, SHIREHAMPTON, GLOUCESTERSHIRE.—Memorial-stones of a Baptist church at Shirehampton were laid on the 5th inst. The contractor's price for the building is 2,044l., and accommodation will be provided for a congregation of about 300. The chief entrance will be from Pembroke-road, the church being entered through a porch, on both sides of which will be a lobby. At the further end of the building will be vestry-rooms and other offices. The plans were designed by Mr. Benjamin Wakefield, of Bristol, and the work is being executed by Messrs. Bis & Sons, of Portishead. The church will be 50 ft. by 27 ft., and the height from floor to ridge 22 ft. The east and west walls will be panelled on the inside to the height of 4 ft. 6 ins., these panels being movable so that they may be pulled out to form sixteen classrooms. The roof will be an open timber one covered with red tiles, and the floor will be of pitch-pine wooden blocks.

BAPTIST MISSION CHURCH, BROADWATER.—The foundation-stone of this new building was laid on Wednesday, December 14. The portion at present in course of erection is the mission church, which will form eventually the schoolroom when the future church is built. The building is designed in a free treatment of late Gothic, and is faced in red brickwork. The contract is let to Messrs. P. Sandell & Sons, the amount being 463l. 15s., and the architects are Messrs. George Baines & R. Palmer Baines, London.

CHANCEL, BRIGHOUSE CHURCH.—The work of erecting the new chancel at Brighouse Parish Church is now completed. The work has been done under the superintendence of Mr. Hodgson Fowler, architect, of Durham, and it has cost over 3,000l.

METHODIST CHURCH, BELFAST.—The new Methodist church, erected at Jenynmount, Shore-road, was opened on the 3rd inst. The building is 76 ft. in length and 57 ft. in width, and in addition to it there is a lecture hall and schoolroom at the rear. The pulpit, gallery front, and pews are of pitch-pine, and the gallery front being picked out in colour, and finished on top with a mahogany capping. The heating is by hot water, the apparatus having been supplied by Messrs. Musgrave, Ltd. Mr. Harrison McCloy had charge of the plumbing. Mr. Stanley Johnson carried out the gas-fitting, also the laying of the wires for the electric lighting, under the supervision of Mr. John Woodside. Cathedral lead lights have been supplied by Messrs. Campbell Brothers. The contractor for the entire work was Mr. James Kidd, and the architect Mr. W. D. R. Taggart. The cost is estimated at 5,000l.

WESLEYAN CHAPEL, DUFFIELD, DERBYSHIRE.—The new Wesleyan chapel, which has been erected at Duffield, was opened on the 7th inst. The work has been carried out from the designs of Mr. J. Jameson Green, architect, Liverpool, by Mr. Andrew Hingley, builder, Duffield, at a cost of 3,154l.

FREE CHURCH HALL, WENWICK, LANCASHIRE.—The foundation-stone of this building was

laid a short time ago. The architect is Mr. G. T. Oakley, of Bristol.

WORKHOUSE EXTENSIONS, CHESTERFIELD.—The new workhouse infirmary and the alterations and additions which have been made to the workhouse, at a cost of over 40,000l., were open to inspection a few days ago. The new buildings consist of an infirmary, a nurses' home, porter's lodge, laundry, kitchen, boiler and engine house, workshop, mortuary, disinfectant, additions to wards, entrances, stores, administration block, and a general remodelling of the workhouse. The infirmary is parallel with, and close to, Newbold-road, in front of the old workhouse premises. It is in three connected blocks, the central building being devoted to administration purposes. There is accommodation for 204 patients. The place is illuminated by electricity, and heated throughout by hot water. The nurses' home provides accommodation for twenty nurses. The laundry is situated on the west side of the workhouse. Messrs. Rollinson & Son, Chesterfield, were the architects; Messrs. Maule & Co., Chesterfield and Nottingham, the contractors; and Mr. J. Rushton, Chesterfield, was the clerk of the works.

CO-OPERATIVE SOCIETY'S NEW PREMISES, CARLISLE.—New premises have been erected for the directors of the Carlisle South End Co-operative Society, in Botchergate. To obtain the large shop accommodation required, the architect, Mr. T. Taylor Scott, of Carlisle, adopted a central arcade scheme with a wide approach from Botchergate, which gave a total frontage of window space of about 350 ft. The front elevation has been constructed with white polished ashlar stone and dark slip granite pilasters, with iron caps. It is in the Renaissance style, freely treated, with large gables at each end, and a balustrade between same, divided by ornamental gables. The arcade is covered over by an ornamental iron roof and glass, with ventilating glazed decklights, and round the four sides on each floor has been constructed overhanging fireproof balconies, protected by ornamental railing, access to each balcony being obtained by means of a fireproof staircase. The balcony on the second floor, besides leading to all the showrooms, gives access to the large public office, strongroom, and check-room, and the private offices for the secretary, treasurer, and manager. The balcony on the third floor is mainly used for the large hall, capable of accommodating between 800 and 900 people. The platform occupies part of one side, and the roof is a large span open iron structure. A storage-room and caretakers' room occupies one end. The board-room has also been arranged on this floor, with panelled pitch-pine dado, and boarded walls and ceiling, together with committee and waiting-rooms. The boot-repairing shop, etc., with electric-driven machinery, is also on this floor, and a dining or refreshment room for the assistants. The fourth floor contains workrooms. The clerk of works was Mr. S. Jack, and the local contractors engaged were Mr. William Baty, builder; Mr. R. Nelson, carver; Mr. G. Black, joiner; Messrs. R. M. Ormerod & Son, plasterers; Mr. Thomas Sowerby, plumber; Mr. F. Hart, slater; Messrs. R. M. Hill & Sons, painters, electric light, and ventilating engineers' work; Mr. John Corbett, ironwork. The outside contractors were Messrs. Mackenzie & Moneur, Ltd., heating engineers, Edinburgh; Messrs. Bladen & Co., ironfounders, Glasgow; Messrs. Pickering & Co., Ltd., electric hoists and machinery, Stockton-on-Tees; Messrs. Merryweather & Co., fire appliances, London; Messrs. Pilkington & Co., mosaic work, Manchester; and Messrs. Maw & Co., Ltd., tile-work, Shropshire.

CONSERVATIVE CLUB, PARKSTONE.—A new Conservative club has just been opened at Parkstone. It has been erected by Messrs. A. & F. Wilson, builders, from plans prepared by Mr. E. E. Clarke, architect. On the ground floor there are an attendance hall, waiting-room, and other offices, whilst a billiard-room is in course of erection. On the first floor are a cardroom and reading-room, a luncheon and tea room, committee and club room, chess and whist room, lecture, debating, and assembly room. On the second floor are a cloakroom, bathroom, members' lavatory, and caretaker's room. There is also another billiard-room; provision has been made for lighting the building by gas and electricity. The installation of the electric light, together with erection of a 5½ h.p. gas-engine and a 60-light dynamo, are in the hands of Mr. A. W. Hine, A.M.Inst.C.E.

UNIVERSITY SETTLEMENT HALL, CARDIFF.—A new University Settlement hall has been erected at the corner of Walker-road and Spott-road, Cardiff. Mr. R. W. Schultz is the architect, and the cost has been 1,800l. The walls are built of red brick, and the roof is of red tiles.

CONSERVATIVE CLUB AT HOYLAND, YORKSHIRE.—The Countess Fitzwilliam laid the cornerstone, at Hoyland Common, on the 6th inst., of a new Conservative club. Mr. E. J. Sykes is the architect, and Mr. A. Hemingway the builder.

RIDLEY HOUSE, BETHNAL GREEN.—Ridley House, which forms an addition to the facilities for developing church work in the parish of St. James the Less, Bethnal Green, was opened by Lady Wimborne on Saturday last. The Building, of which Mr. E. Hoole is the architect, affords accommodation, on the ground floor, for a young men's club and Bible class hall, and for a medical mission and surgery; on the first floor for four club-rooms and rooms for curates, and for the University men; and on the second floor for bedrooms and cubicles for young men, with dining-room and kitchen.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Charles Lee, formerly General Manager and Secretary to Messrs. Hobbs, Hart, & Co., Ltd., Arlington-street, Islington, has recently been appointed Managing Director of the Company.—Mr. B. G. Wilmer, who has traded under the name of Ashton & Green Iron Co. for over fifteen years and is, and will continue to be, the sole proprietor of the business, announces that, on and after January 1, 1905, the title will be changed to Wilmer & Sons.

INSTITUTE OF CERTIFIED CARPENTERS.—The annual Report of this Institute states that the number of new members elected this year has been thirty-two, as against sixteen last year. The Institute numbers 130, exclusive of Honorary Members. Among the proceedings of the past Session was the opening of a discussion by Mr. W. Middleton, on "Failures in Carpentry and Joinery," which was illustrated on the blackboard by sketches, and was continued at the succeeding meeting, a visit to the Victoria and Albert Museum, in course of erection at South Kensington; a visit to Messrs. Walker, Parkers & Co's works, Belvedere-road, S.E., on this occasion the party being conducted over by Mr. Palmer; to St. Paul's Cathedral, Sir John Riddell conducting the members over, and another visit to inspect the dome and roofs. In September a new departure was taken by the members in organising an outing, the party taking train to Egham, where an inspection was made of the old timber roof of Egham Palace.

APPOINTMENT.—Mr. Alfred Griffin, of No. 34, Coleman-street, E.C., and Blackheath, has been appointed Surveyor to the Trustees of Morden College, Blackheath, from the beginning of next year, upon the retirement of Mr. Thomas Barnes-Williams.

EDINBURGH AND LEITH BUILDING TRADES' ASSOCIATION.—The annual dinner of the Edinburgh, Leith, and District Building Employers' and Allied Trades' Association, in conjunction with the Building Trades' Exchange, took place on the 8th inst. in the Royal British Hotel, Princes-street. Councillor Neil McLeod, President of the former body, presiding over a gathering of about 150. The coupriers were Messrs. Patrick Knox, John D. Burn, and James Millar. Replying on behalf of Leith to the toast of "The Corporations of Edinburgh and Leith," Bailie Kinnaid said that, according to a statement he had received from the Burgh Surveyor, warrants had been granted during the year for buildings of a total value of 180,000l., as compared with 270,000l. in 1903, and had it not been for the new poorhouse, the total value would have been less by about one-half. The prospect of the building trade in Leith, he said, was not very bright, and, judging by the number of unlet houses, the supply seemed to be greater than the demand. In acknowledging the toast of "The Architects and Surveyors," Mr. A. Lorne Campbell said that, at the present time, they had not much prosperity to share. With the builders they were brothers in affliction, but they hoped for improvement in the course of another year. He quoted the remark of a public official in the city who had said to him in conversation that for the last forty years he had not seen such slackness in work, and that when the city was half the size he had seen double the work doing. Mr. James Millar, in replying to the toast of the evening, said that, while they were passing through a strain at the present time, they knew it could not last for ever.

DRAINAGE PLANS.—The Public Health Committee of Battersea reported on Monday having considered the circular letter from the Royal Institute of British Architects, suggesting that the London County Council by-laws respecting drainage plans should be modified. The Committee was of opinion that no alteration in the by-laws was necessary.—

The Works Committee of Hammersmith Borough Council reported on Tuesday having agreed in favour of informing the London County Council that their experience does not show that the suggested modification of the by-laws is necessary.—On Tuesday the Public Health Committee of St. Pancras Borough Council reported that they had decided that the communication from the Royal Institute of British Architects be marked "Received."

COMBINED DRAINAGE.—Lambeth Borough Council has passed the following motion:—"That the President of the Local Government Board be urged to promote remedial legislation on the subject of combined drainage in the coming Parliamentary Session."

WATER SUPPLY, TEIGNMOUTH.—At the meeting of the Teignmouth Urban District Council on the 6th inst., a report was presented by the Surveyor, Mr. C. F. Gettings, of alternative routes for the laying of pipes to bring in a supply of water from Paiguiton Urban District Council. After some discussion the further consideration of the subject was adjourned for a fortnight.

UNDERGROUND ROOMS IN ST. PANCRAS.—The Public Health Committee of the London County Council reported as follows at Tuesday's meeting of the Council:—"We have from time to time reported the progress made by the St. Pancras Metropolitan Borough Council in dealing with illegally occupied underground rooms in that borough, and are glad to state that, from a report recently issued by the Medical Officer of Health of St. Pancras, it appears that between July, 1903, and July, 1904, 538 notices were served upon the owners of underground rooms which were occupied as dwellings in contravention of the provisions of the Public Health (London) Act, 1891: 165 of these notices referred to premises in South St. Pancras, and 373 to premises in Central St. Pancras. The notices were served in eight separate groups at varying intervals, the occupants being allowed from two to four months in which to obtain other dwellings. All the notices were complied with, with the exception of two. In one of these two cases proceedings were taken, with the result that the magistrate gave the defendant one week in which to clear the room; in the other case the occupiers locked up their room and left London to go hop-picking, and have not yet returned, but in this case the landlord has promised to deal with the matter as soon as they do return. The Borough Medical Officer states that the 538 notices above referred to deal with all the known underground sleeping-rooms separately occupied which have their ceilings less than 1 ft. above the level of the adjoining street or ground."

MUNICIPAL COUNCILS AND ARCHITECTURAL WORKS.—At the meeting, on Tuesday, of the West Ham Corporation, the Works Committee reported having had under consideration a memorial from the Royal Institute of British Architects and the Architectural Societies in alliance therewith throughout the United Kingdom, urging upon county and municipal authorities:—(1) That architectural work be not placed in the hands of engineers or surveyors; (2) that where it is deemed desirable for architectural work to be carried out by county or municipal officials, such officials shall be required to have passed the qualifying examinations of the Royal Institute of British Architects; (3) that the work of an official architect be restricted to structures of secondary importance, and that all buildings of a monumental character be entrusted to independent architects, to be selected in such a way as may seem best to the local authority. The Committee was unable to recommend that any action be taken with respect to the memorial. The report was adopted.—On Tuesday, the Public Health Committee of St. Pancras Borough Council reported having decided that the memorial be merely received.

HOUSING SCHEME, MANCHESTER.—The Manchester City Council, having asked for leave to borrow 13,780l. for the purchase of land for building purposes, Major C. E. Norton, R.E., held an inquiry at the Town Hall on the 8th inst. The land to be purchased is in Cheetham Hill-road, Queen's-road, and Boyle-street. It is required for the purposes of part 3 of the Housing of the Working Classes Act, 1890. Mr. Hudson, Assistant Town Clerk, stated that the land mentioned in the application was part of a larger plot containing 7½ acres belonging to the Earl of Derby. The price was 6d. a yard at twenty-four years' purchase. Not less than 22,938 sq. yds. was to be used for housing purposes. The remainder would be set apart for a school, and the widening of Cheetham Hill-road. Mr. T. de Courcy, the City Surveyor, produced a plan of the property to be acquired. The site, he said, contained a net area of 22,938 sq. yds., and is about one mile and a third from the centre of the city. The ground is almost

level and well adapted for the purpose for which it is intended. A large number of working-class dwellings are in course of erection by private owners in the immediate neighbourhood.

THE NATIONAL REGISTRATION OF PLUMBERS.—The Committee appointed by the Conference of Health and Water Authorities, Architects, and Plumbers, held at Birmingham in October, 1900, held another meeting this week in the Guildhall, London. The Committee is composed of Health and Water Authorities and Plumbers in equal proportions, and elected on a basis of a minimum population of a quarter of a million. Mr. W. D. Caroe, Architect to the Ecclesiastical Commissioners, Warden of the Plumbers' Company, presided. Representatives attended from Birmingham, Bradford, Bristol, Glasgow, Leeds, Manchester, Newcastle, Norwich, Nottingham, and Plymouth. The Committee considered the resolution passed in the Municipal Section of the Sanitary Institute Congress, recently held at Glasgow, as to its being necessary to the effective administration of the Public Health and Water Acts that the authorities should be recommended and empowered to require the competency of plumbers employed to execute or inspect plumbers' work under the public regulations, should be certified by the Plumbers' Company under the conditions appertaining to the National Registration of Plumbers, or such other body as may be set up by statute, or be approved by the Local Government. A considerable discussion arose on the subject of the terms of the recommendation, and closed to all applicants who did not pass an examination in practical work as well as theoretical subjects. It was urged that this would be unfair to some of the older men, and, having regard to the divergent views taken by the district councils in various parts of the country on the subject, it was resolved to extend the period to December 31, 1905. The returns showed that upwards of 2,500 plumbers had been registered by the Company. Resolutions were passed recommending for general adoption apprenticeship for plumbers on the lines of the indenture settled by the London Apprenticeship Board, and further recommending that all apprenticeships should be in writing, as it was shown that the loose practice of taking lads upon verbal agreements varied greatly, and resulted in their being, in some cases, insufficiently trained, and also offered inducements to jerry builders and others to employ apprentices only partly trained. Communications were laid before the Committee from the Royal Institute of British Architects, and Societies allied to the Institute, as to the nomination of local authorities to act on the district councils. Resolutions were passed giving effect to this arrangement, and to the election, *ex officio*, of persons in virtue of their holding official positions in connexion with public health and water administration. Plumbers were appointed from Birmingham, Bristol, Glasgow, and Manchester, to act with the London Board of Examiners in settling tests of workmanship, etc. Resolutions were also passed referring questions relating to the examination of students in planning classes to local authorities and the Board of Education.

INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS, AND GRAVERS.—At the third annual general meeting of the International Society of Sculptors, Painters, and Gravers, the Vice-President, Mr. John Lavery in the chair, the Hon. Secretary, Mr. T. Stirling Lee, reported that the last exhibition had been entirely satisfactory. The number of works submitted was greater than it had hitherto been, and the financial result was such as to defray all expenses. The great loss of the Society this year has been the retirement from office of the Hon. Secretary, Professor George Sauter, whose services were greatly appreciated, and his retirement much regretted. The issues to the Society by death were:—Mr. J. Saatsa Forbes, Mr. Fred Sandys, Mr. D. Vierge, and Mr. John Galsworthy. By the death of Mr. Staats Forbes the Society had lost one of its best friends and financial supporters. It is hoped that the works of Mr. Sandys and Mr. Vierge will be adequately represented in the forthcoming exhibition. An arrangement has been come to with the Corporation of Manchester to take on the exhibition at its closing in London. The arrangements for this exhibition are most satisfactory, and appointments have been made likely to be of the greatest service to the Society, by selecting delegates aboard and in America. The following artists will act for next year:—Mr. Blanche for France; Mr. Neven Du Mont and Professor Sauter for Germany; Mr. Fragaanno for Italy; Mr. Zorn for Sweden; Mr. Claus for Belgium; Mr. Breiter for Holland; Mr. Chase for America; and Mr. Walton for

Scotland. It is ensured that in this way the Society will succeed in obtaining a more representative exhibition from each country. The Memorial Exhibition of the late President, Mr. Whistler, will take place in the New Gallery during the latter part of February and March, 1905. The following gentlemen were elected to act on the Selecting and Hanging Committee for 1906:—Messrs. H. Wilson, J. Pennell, B. Priestman, A. Neven Du Mont, C. H. Shannon, J. H. Furse, W. Strang, and Grosvenor Thomas.

BOLTON ARTS GUILD.—"FLORENCE AND THE RENAISSANCE."—In connexion with the Bolton Arts Guild, Mr. Marshall Robinson delivered on Tuesday last, at the Guild Rooms, a lecture on "Florence and the Renaissance." He said the term "The Renaissance" was usually applied to the revival of classical art in the XVth and XVIth centuries, but it applied also in a much more interesting degree to that earlier period following immediately upon the time known as the Dark Ages, when there was a general awakening in Italy, and a desire to revive the arts and civilisation of the ancient Greeks and Romans. Mr. Robinson sketched the decay of art up to the reign of Constantine, who attempted to revive it, and afterwards referred to the reign of Charlemagne in the VIIIth century and his partial success in the revival of art and civilisation. He next referred to Pisa, where the seeds of the revival were sown. Florence was next touched upon, as well as Fiesole, the ancient Etruscan city from which Florence sprang. He sketched the history of Florence up to the time of Dante in 1265, and, returning to Pisa, he illustrated the monuments—the cathedral, the baptistry, the leaning tower—and the work of Niccola Pisano. He next took his hearers to Siena, and, returning to Florence, followed the development of early art both in sculpture, architecture, and painting; through the Byzantine Giottoesque schools as regards painting, with Ghiberti, Donatello and others as regards sculpture, and Arnolfo Di Cambio, Giotto, Orcagna, Brunelleschi, etc., as regards architecture. To illustrate the various stepping-stones in the development of art, Mr. Robinson brought to his aid some 130 slides, taking the various branches of art in their chronological sequence. The lecture dealt mainly with the early revival, and it is the intention of Mr. Robinson to deal with the later development of art in a second lecture to be delivered in February.

Legal.

CASE UNDER THE LONDON BUILDING ACT, 1894.

At the North London Police Court on the 12th inst. Mr. Alfred Louis Camille was summoned before Mr. J. Dickenson, at the instance of Mr. W. G. Perkins, District Surveyor for West Hackney (a) for doing work to, in, or upon, a building without notice; (b) for failing to comply with a notice of irregularity served by the District Surveyor.

The defendant had fixed, or set up, in a stable at No. 101, Dalston-lane, Hackney, a smith's forge or furnace, having an iron chimney or flue carried up into and through the roof.

In reply to the magistrate, the defendant contended that the District Surveyor could not, as he had by the notice of irregularity, require him to substitute a brick flue for the iron pipe, as pipe flues were permitted by section 65 (3) of the Act.

The District Surveyor argued that section 65 (3) was a rule applying to close fires only, and not to a forge or furnace, and that, having regard to section 64 (4) and (12), the chimney or flue therefrom should be enclosed with brickwork. It was also pointed out that there was a large amount of woodwork both in this stable and the adjoining stables to be considered.

The defendant was fined 7s. with 2s. costs, for doing work without notice, and ordered to comply with the Surveyor's notice within twenty-one days, and pay 2s. costs on the second summons.

Mr. C. V. Young, solicitor, appeared for the District Surveyor.

ACTION BY ARCHITECT AGAINST BUILDING OWNER.

The case of Stocks v. Dean came before Mr. Justice Kennedy, in the King's Bench Division, on the 9th and 10th insts.—an action, brought by Mr. Frederick Wm. Stocks, an architect and surveyor, of Middlewich, Cheshire, against Mr. E. Houghton Dean, of Hawkehead, Lancashire, to recover 370l. for services rendered, and also for damages for alleged wrongful dismissal.

The defendant denied that there was anything due to the plaintiff, and alleged that he was justified in dismissing the plaintiff.

He also counterclaimed against the plaintiff for damages for alleged negligence, which the plaintiff denied.

Mr. Ellis Griffiths and Mr. Owen Roberts appeared for the plaintiff, and Mr. Samuel Moss for the defendant.

Mr. Ellis Griffiths, in opening the case, said the plaintiff had thirty years' experience in building and engineering work. He had been employed by the Duke of Buccleugh, and the Ecclesiastical Commissioners, had been Assistant Surveyor to the Accrington and Clitheroe Urban District Councils, and was now Surveyor to the Middlewich Council. In 1891 he was engaged by the defendant to act as his architect and surveyor for the development of an estate in Knutsford, which it was calculated would take five years, but on December 16, 1902, he was dismissed without notice. The cost of the work was estimated roughly at 40,000l., and plaintiff was to have a commission of 4 per cent. on the cost of the buildings when erected. There were three and a half years of the contract still to run, during which period he would have received 1,650l.

His lordship said he had never tried a case before in which a professional man paid by fees sued for wrongful dismissal. It was rather a strong thing to say that the defendant had tied himself to giving the plaintiff all the work for the five years, and if it was a question of employment with reasonable notice he could not see how he was going to deal with the matter.

Mr. Ellis Griffiths submitted that the mode of payment made no difference. The character of the occupation must be looked at, and, in his opinion, the plaintiff was entitled to the same notice as if he were receiving a salary.

His lordship: You are putting yourself in the position of a servant, and I do not think a professional man would care for that.

Mr. Moss admitted that, if his client was not justified in dismissing the plaintiff, the latter would be entitled to some damages.

Mr. Ellis Griffiths said the defendant alleged three justifications for the dismissal. He said that the cost of the buildings exceeded the estimate by 10 per cent., that there had been a lack of skill and want of care on the plaintiff's part, and that he had been guilty of improper conduct. The last two were very serious charges to make against a professional man, but he would be able to dispose effectively of them.

The plaintiff was called and corroborated his counsel's opening statement.

In cross-examination, he denied that any of the work charged for was done after the date of his dismissal. The cost of some of the buildings exceeded the estimate by 10 per cent., which was a very moderate excess. He admitted that in one case there was an excess of 30 per cent., but that was due to the work having been altered in various details. He knew that two of the drains had been taken up, but that was not due to any fault in the original laying of them. A contractor had offered him 10l. to get him a contract, but he refused the money, and told the defendant of the matter. Subsequently the contractor sued him for 26l., and plaintiff, acting on the advice of his solicitor, counterclaimed for the 10l.

In re-examination, plaintiff stated that about six weeks before his dismissal defendant told him he greatly appreciated his work, and, as he had been put to a great deal of trouble, he made him a present of 100l.

Mr. John Holden, F.R.I.B.A., F.S.I., and Mr. J. T. Ashton, an architect and surveyor, gave evidence that, in their opinion, plaintiff's charges were reasonable.

This being the plaintiff's case, Mr. Leason, an architect and surveyor, of Manchester, gave evidence on behalf of the defendant that he found some of the drains not jointed with cement.

Mr. R. B. Newhall, a plumber and sanitary engineer at Knutsford, examined, said that in November, 1903, he was called in to examine the drainage of one of the defendant's houses in St. Peter's-avenue. It took about thirty hours to find the man-holes—they were buried, which was a most unusual thing. After he found the man-holes, he tested the drains. He applied the smoke test, and found that the drains were very wrong. He found that most of the drains had mortar joints—93 per cent. of mortar and 10 per cent. of cement.

In answer to his lordship, Mr. Moss said that the contract specified cement joints.

Examination continued. If the architect had applied the water test or the smoke test the defect would have been easily discovered.

At the conclusion of the evidence and the addresses of counsel, his lordship, in giving judgment, said the plaintiff was a gentleman who had entered into a contract, contained in

the correspondence, with the defendant who had property which he wished to develop as a building estate. The defendant also, apparently, employed the plaintiff in other business matters which, though they appeared on the pleadings, were now removed from his consideration, and would be dealt with elsewhere. By the terms of the contract, as ultimately agreed, the plaintiff was to receive from the defendant 4 per cent. upon the cost of the actual works executed. The first question he had to decide was, whether the plaintiff was rightly dismissed, as he was by the defendant in December, 1902. When he said "rightly dismissed," he did not mean at all, and it must not be taken that he had implied, that, so far as competence was concerned, plaintiff could not, if he gave his mind to the matter, have been competent. All he meant by that was to ask himself whether the plaintiff had performed his duties in such a way that the employer could say that they could not go on any longer together. It was clear that the defendant would be justified in dismissing the plaintiff if, in addition to his not doing his work with care and skill, he had acted dishonestly in his building relations with the contractors. That was a point which had given him great anxiety, because one realised what such a charge was against a professional man—viz. that he had betrayed the interest of his employer, and had acted dishonestly. The alleged dishonesty was not known at the time of the plaintiff's dismissal, therefore it was not insisted upon as a ground for it. But it was clear law that, to justify a dismissal, a good defence could be raised upon misconduct, although it did not form the actual ground for dismissal. The question was, had the plaintiff acted dishonestly with regard to the transactions referred to in the evidence. His lordship, having referred to the evidence on this part of the case, said that, in his opinion, the charge was distinctly not made out. He thought, on the facts, he ought to come to the conclusion that, although the plaintiff was offered the 10%, he did not intend to take it, and he thought the plaintiff had acted as a gentleman in telling his employer, as he did, and he was perfectly willing to believe that the plaintiff had acted honourably in so doing. The awkward part of it was the thing which the plaintiff brought upon himself, and that was when an action was brought against him for money which it was said he owed, a counterclaim was set up, and amongst other things in the counterclaim was a claim for the 10%. His lordship did not know where the blame was, but sometimes a man did not tell the whole facts to his solicitor, and probably the whole thing was a mistake. He thought that the balance of evidence showed that the plaintiff had acted honourably and as a professional man should act. Balancing the whole of the evidence together he would only say this, that it was not proved to him that anything dishonest had been done by the plaintiff. Although he thought there had been unbusinesslike transactions, he did not think he ought, in a case such as the present, to form an opinion hostile to the honesty of another man without stronger evidence than he had then before him. Then came the question of conduct on which the plaintiff was dismissed by the defendant—viz. that the plaintiff had gone so badly wrong that defendant could not really give him anything more to do. Although the defendant might have made alterations as the work went on, he thought the work cost considerably more than what the defendant intended to spend. Of course some margin must be allowed, because building owners would change their minds; but there was a serious blunder made in one case which had made a difference of 150% over and above the contract price. There was no doubt a considerable increase in the cost of the work over the estimates, which would, of itself, not have justified the defendant in putting an end to the contract; but he thought, with regard to one matter, a case had been made out, that there had been a want of care and skill on the part of the plaintiff. He thought the matter of the drains had been badly neglected. When the drains were opened up it was found that there was practically no cement in the joints, and he thought that no architect, using reasonable care to his employer, ought to have passed them. The jointing in cement was actually specified, and it had been omitted. He could not doubt Mr. Newhall's evidence on that point. He thought the state of these drains, which had cost the employer 23% to set right, was a thing for which the plaintiff was blamable. Then there was a complaint about two cellars, which it was said were damp. That was really only a comparatively minor matter, but it had cost the defendant about 31% 10s. to put right. Again, there was a

question as to a wall which was carried over a drain in such a way that, unfortunately, the wall had subsided for a certain length. The plaintiff said that was largely due to the alteration of the plans by the local authority. He was loath to say that there was anything serious in his want of care with regard to that. That stood on a different basis to the mischief caused by the bad drains and to the bad cellars of the house. He held, therefore, on those grounds that the defendant was justified in dismissing the plaintiff. His lordship, having gone at some length into the figures, entered judgment for the plaintiff on the claim for 118% 4s. 7d., and for the defendant on the counterclaim for 35% 13s. 5d., the plaintiff and the defendant to have the costs of the issues on which they had individually succeeded.

ARCHITECT'S JURISDICTION UNDER A BUILDING CONTRACT—IMPORTANT QUESTION OF CONSTRUCTION.

THE case of *Robins v. Goddard* came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 15th and 14th insts., on defendant's appeal from a judgment of Mr. Justice Farwell, sitting as an additional judge of the King's Bench Division.

The action was brought by the plaintiff, Mr. A. W. Robins, a builder, of Wanstead, against the defendant, Mr. T. F. Goddard, of Croxley Green, Rickmansworth, for a sum of money alleged to be due upon the certificates of the defendant's architect pursuant to a building contract. Defendant denied liability, and he alleged that the amounts which purported to be allowed by the certificates for work and materials were not in accordance with the provisions of the contract, and were unreasonable and excessive, and that some of the work and materials were not in accordance with the contract or as specified, but were defective, with the result that he would have to incur great expense in re-executing much of the work and in the purchase of proper materials. He accordingly counter-claimed for damages for the plaintiff's alleged breach of contract. Mr. Justice Farwell gave judgment for the plaintiff for the amount claimed, and held that there was no case on the counter-claim. The defendant now appealed.

Mr. C. A. Russell, K.C., and Mr. C. B. Marriott appeared for the appellant, and Mr. Duke, K.C., and Mr. Beddall for the respondent.

Mr. Russell, in opening the case, said several actions had been consolidated, which were brought by the plaintiff upon certificates of an architect under a building contract to which a defence and counter-claim were pleaded by the defendant, the building-owner, alleging defects in the work and such like matters. Upon the case coming on for trial before the learned judge, he decided that the certificates were absolutely conclusive, and he gave judgment for the plaintiff, the builder, upon the certificates, and held that the defendant was not entitled to go into his counter-claim at all. The question ultimately came to be one as to the construction of a few clauses in the building contract. The contract was dated October 15, 1902, and it was in the form which was issued under the sanction of the Royal Institute of British Architects. He thought he should be able to show their lordships that the scheme of that form of contract was far from being what the learned judge had held it was, and really was just the opposite. The work was begun by the builder early in 1903. It was apparent from the first that the defendant was dissatisfied with the plaintiff's work, and in February, 1903, his dissatisfaction had gone so far that he wrote to the architect asking him not to give any further sums to the plaintiff. The architect, in spite of that, issued the first set of certificates, which formed the subject-matter of the action. In May, 1903, the defendant formally served the architect with notice requesting him not to issue any further certificates. Their lordships would see, when they looked at the contract, that the effect of the architect not issuing certificates would have been to leave to the arbitrator appointed under the contract the question of what was due to the builder, and whether the certificates had been properly withheld. Notwithstanding that notice, however, the architect went on issuing certificates. He issued a further certificate on May 25 for 300% odd, and his final certificate in July for 1,055% odd. The first action was commenced on May 12 on the three certificates, and then the plaintiff applied for summary judgment under Order XIV. The defendant took out a cross-application that the whole matter should be referred under the clause of the contract, but the master took the view that the proper order to make was to give the defendant leave to defend, and subsequently, the other actions being commenced, they were all consolidated.

The matter ultimately came before the Court of Appeal on the defendant's appeal from the order restraining the reference, and that appeal was dismissed. The next step was the trial of the claim and counter-claim before Mr. Justice Farwell. The learned counsel then referred to the material clauses in the building contract. He said the first clause he wished to refer to was No. 30, which provided that the contractor should be entitled under the certificates to be issued by the architect to the contractor within fourteen days of the date of each certificate, to payment by the employer from time to time by instalments when, in the opinion of the architect, work to the value of 100% (or less at the reasonable discretion of the architect) had been executed in accordance with the contract, at the rate of 80 per cent. of the value of work so executed in the building, until the balance retained in hand amounted to 200%, after which time the instalments should be up to the full value of the work subsequently executed. The contractor should be entitled, under the certificate issued by the architect, to receive payment of 100%, being part of the sum of 200%, when the works were practically completed, and in like manner to payment of the balance within a further period of two months, or as soon after the expiration of two months, as the works should have been finally completed, and all defects made good according to the true intent and meaning thereof, whichever should last happen. It also provided that the architect should issue his certificates in accordance with the clause, and that no certificate of his should be considered conclusive evidence as to the sufficiency of any work or materials to which it related, nor should it relieve the contractor from his liability to make good all defects as provided by the agreement. Mr. Russell said the defendant's counter-claim, which the learned judge held was not maintainable, alleged insufficiency of work and materials to which the certificates related. In respect to that provision, his lordship had held the certificates were absolutely binding on the defendant. The arbitration clause No. 32 ran: "Provided always that, in case any dispute or difference shall arise between the employer or the architect on his behalf and the contractor, either during the progress of the works or after the determination, abandonment, or breach of the contract, as to the construction of the contract, or as to any matter or thing arising thereunder (except as to the matters left to the sole discretion of the architect under clauses 4, 9, 16, and 19, and the exercise by him under clause 18 of the right to have any work opened up), or as to the withholding by the architect of any certificate to which the contractor may claim to be entitled, then either party shall forthwith give to the other notice of such dispute or difference, and such dispute or difference shall be and is hereby referred to the arbitration and final decision of" (certain named persons). "Such reference, except on the question of certificate, shall not be opened until after the completion of the alleged completion of the works, unless with the written consent of the employer or architect and the contractor. The arbitrator shall have power to open up, review, and revise any certificate, opinion, decision, requisition, or notice, save in regard to the said matters expressly excepted above, and to determine all matters in dispute which shall be submitted to him, and of which notice shall have been given as aforesaid in the same manner as if no such certificate, opinion, decision, requisition, or notice had been given." The rest of that clause dealt with the giving to the arbitrator full power as to the costs. Clauses 16 and 17 of the contract were important. Clause 16 ran: "The architect shall, during the progress of the works, have power to order in writing from time to time the removal from the works within such reasonable time or times as may be specified in the order of any materials which, in the opinion of the architect, are not in accordance with the specification or the instructions of the architect, the substitution of proper materials, and the removal and proper re-execution of any work executed with materials or workmanship not in accordance with the drawings and specification or instructions, and the contractor shall forthwith carry out such order at his own cost. In case of default on the part of the contractor to carry out such order, the employer shall have power to employ and pay other persons to carry out the same; and all expenses consequent thereon or incidental thereto shall be borne by the contractor, and shall be recoverable from him by the employer, or may be deducted by the employer from any monies due or that may become due to the contractor." Clause 17 was as follows: "Any defects, shrinkage, or other faults which may appear within twelve months from the completion of the works, arising, in the opinion of the architect, from materials or

workmanship not in accordance with the drawings and specification or the instructions of the architect, or any damage to pointing by frost appearing within the like period shall, upon the directions in writing of the architect, and within such reasonable time as shall be specified therein, be amended and made good by the contractor at his own cost, unless the architect shall decide that he ought to be paid for the same; and, in case of default, the employer may employ and pay other persons to amend and make good such defects, shrinkage, or other faults or damage, and all expenses consequent thereon or incidental thereto shall be borne by the contractor, and shall be recoverable from him by the employer, or may be deducted by the employer from any moneys due or that may become due to the contractor." By clause 13 the contractor had, at the request of the architect, within such time as the architect should specify to open for inspection any work covered up, and, on his refusal or neglecting to comply with such request, the architect could demand other workmen to open it up. The learned counsel in the effect of the learned judge's judgment was conclusive in favour of the contractor unless the architect himself, under clause 17 of the contract, expressed an opinion unfavourable to the contractor. It might be that the architect here, having regard to what he had done, was not personally satisfied with the contractor's work. That would be a most important matter to be tried when the counter-claim was tried, viz., whether the work was or was not satisfactory. But the fact that the architect was not dissatisfied was not conclusive on the employer that the work was satisfactory. There was no provision in the contract that the employer should not complain unless the architect was of opinion that the work was not satisfactory. He submitted that the questions raised by the defence and counter-claim as to the amount of the certificates and the sufficiency of the work and the materials used should be considered. An arbitrator could clearly have dealt with those questions, and have determined the matters in dispute as though no certificates were given. The question he would have asked himself would have been the amount for which the certificates ought to have been given. The general principle had been laid down again and again that where an architect's decision on such a matter as payment was not final against one party, it was not final against the other. Here the withholding of the certificate was not final against the contractor.

The Master of the Rolls said that it looked to him as though the learned judge had construed the contract without reference to the arbitration clause at all, and that the arbitration clause did not apply. He asked if the counter-claim was limited to materials, or particularised.

Mr. Russell replied that defendant complained about the pointing, as to defects in the drains, defects in the brickwork, and plastering, and so on. The particulars as to the complaints extended to several pages. In some cases the complaints were as to workmanship, and in others as to materials. The defendant also claimed damages against the plaintiff for delay in completing the work, and it was difficult to see how a claim for damages for delay could be shut out in the way it had been. He contended that the decision of Mr. Justice Farwell should be reversed.

Mr. Marriott, having followed on the same side,

Mr. Duke, on behalf of the respondent, said the right of appeal under the contract did not arise until after the completion, or alleged completion, of the works. That provision in the arbitration clause was the reason why the attempt to refer the interim certificates failed before the Master.

The Master of the Rolls: Was that action brought before the completion of the contract?

Mr. Duke replied in the affirmative. There were three consolidated actions tried before the learned judge, first for payments outstanding on the three certificates, the second was for the whole amount of one certificate, and the third was for the full amount of the final certificate. The final certificate was dated July 24, 1903. On August 11, the plaintiff gave notice under the arbitration clause. On August 13 there was a preliminary meeting before the arbitrator which the defendant did not attend. On September 1 the defendant issued a summons to restrain the plaintiff from proceeding with the arbitration, and upon that application an order was made by Mr. Justice Walton restraining the plaintiff from proceeding to arbitration. It did not lie in the defendant's mouth to say now he was prevented from taking that proceeding. To succeed in that Court defendant must show he could disregard the contract,

and that he had a resulting cause of action at common law. The question was whether the terms of this contract were to be set aside by the building owner, and he was to be left at large to pursue the remedies he had at common law. He (counsel) did not assert that the architect's certificate was an award, but he did say that, by the contract, his certificate was final unless it was appealed against, and it had not been appealed against. Lord Justice Stirling: The burden is upon you to show that the jurisdiction of the Court is excluded.

Mr. Duke agreed. He said that, when the work was nearly completed, the defendant undoubtedly gave the architect notice not to proceed with the work under the contract. The architect thereupon replied, "dismiss me," but the defendant declined to dismiss him and said he would retain him as architect but forbade him to exercise his functions.

The Master of the Rolls: You suggest that was a breach of contract on the part of the building owner?

Mr. Duke: Yes; I ask your lordships to hear in mind the dilemma in which the builder was placed. The view I ask your lordships to take is that these elaborate provisions for conferring power upon the architect are intended to have effect, and that it cannot be said that this is an open building contract for work and labour which leaves the builder in the same position as though the builder were only to supply materials. Our view was that the interim certificates were to be paid within fourteen days. What happened with regard to the final certificate was that, when notice was given to the building owner that there were disputes, and that we desired a reference to the arbitrator named in the clause and we got an appointment before him, the building owner took proceedings to stop his arbitrating and brought his counter-claim, not only against the final certificates, but also against the interim certificates. I venture to submit on those facts that it is not fair that the builder should be deprived of the right for which he had contracted.

The Master of the Rolls asked if the parties could not agree on some gentleman to try the case.

Mr. Duke said that he was willing that the President of the Institute should name an arbitrator. This protracted litigation was ruinous to the plaintiff.

Mr. Russell said that defendant would prefer an official referee.

After some further discussion, it was arranged that the learned counsel on both sides should endeavour to come to an agreement on some special referee to whom the case could be referred.

In giving judgment, the Master of the Rolls said he thought the case was really unarguable. The point was whether the certificate of the architect was conclusive in the circumstances. The learned judge, for some reason, had ignored the arbitration clause in the contract, and, ignoring it, he thought the construction of the contract was clear. He (the Master of the Rolls) could understand, if clause 32 were not in the contract, that it might be contended that the certificate of the architect was final. The effect of that clause was to cut away the ground from beneath the plaintiff's contention that the defendant was debarred by the architect's certificate from setting up that bad workmanship or materials had been introduced into the building. The matter was to be dealt with by the arbitrator as if no certificate had been given. The common law jurisdiction of the Court remained, and the counter-claim was maintainable. But for the fact that Mr. Justice Farwell had ignored the existence of the arbitration clause he must have come to the same conclusion, as he (the Master of the Rolls) had. He thought the appeal must be allowed.

The Lords Justices concurred.

The costs of the appeal were made the defendant's in any event, the costs of the action and counter-claim being reserved until the result of the inquiry was known.

ACTON ANCIENT LIGHT DISPUTE.

The case of *Kine v. Jolly* came before the Court of Appeal, composed of Lords Justices Vaughan Williams, Romer, and Cozens-Hardy, on the 8th, 9th, 13th, 14th, and 15th insts. on the defendant's appeal from a judgment of Mr. Justice Kekewich in the Chancery Division.

(The case was reported in the issues of *The Builder* of July 23 and 30 and August 6, 1904.)

This was an action by Mrs. Sarah Kine, the owner of a freehold house and premises, known as "Woodthorpe," Acton-road, Acton, against the defendant, Dr. Jolly, the owner of neigh-

bouring premises, for a mandatory injunction, and alternatively for damages, in respect of the alleged obstruction of the ancient lights of the plaintiff, and also for trespass. From the amended statement of claim, it appeared that the ground floor of the plaintiff's premises had on the west side two windows, lighting respectively the drawing-room and a smaller sitting-room, and a door with glass panels and a window or fanlight over it, lighting the entrance-hall. The plaintiff alleged that, in spite of remonstrances made on her behalf, the defendant had erected and maintained a high building near to the said window, glazed panels, and fanlight, and had thereby materially obstructed the light from entering into her house, and thus interfered with her in the use and enjoyment of the said land and dwelling-house. The plaintiff also alleged that the defendant's building projected over and overhung her land, and that the defendant, by erecting and maintaining his said building, trespassed on her land; the defence was generally a denial of the allegations in the statement of claim. A great deal of expert evidence was given at the trial, and in the result Mr. Justice Kekewich held that, although there was some obstruction by the defendant's building with the light of the plaintiff's drawing-room, it still remained a well-lighted room. He therefore, in accordance with the rule laid down by the House of Lords in the case of the *Horne and Colonial Stores v. Colls*, could not deem the obstruction of the light to that room actionable, and he decided that, taking that room alone, the plaintiff had no cause of action. He, however, found that the obstruction by the defendant's building to the plaintiff's morning-room was substantial, and such as to constitute an actionable nuisance within the meaning of the authorities on the subject. His lordship also considered that there was an obstruction to the light of the plaintiff's hall, and he made a mandatory order on the defendant to pull down so much of his house as caused a nuisance to the plaintiff by the obstruction of the light to the windows of the morning-room and the hall, as the same existed previous to the erection of the defendant's house, and he directed the defendant to pay the costs of the trial. Hence the present appeal.

Mr. Hughes, K.C., and Mr. Vernon appeared for the appellants, and Mr. P. O. Lawrence, K.C., and Mr. Cann for the respondent.

Mr. Hughes, in opening the case, said their lordships would probably remember something about it, as it came before that court last sittings. Mr. Justice Kekewich had granted a mandatory injunction in the case before the decision of the House of Lords in the case of the *Horne and Colonial Stores v. Colls*. When the appeal came before their lordships from Mr. Justice Kekewich's decision, Mr. Lawrence, for the plaintiff, agreed he could not support the judgment, and admitted that the learned judge had misdirected himself. Mr. Lawrence agreed that the judgment could not stand as it was, and consented to the order being discharged and to the case being sent back to Mr. Justice Kekewich for a new trial. Their lordships accordingly sent the case back to Mr. Justice Kekewich to be retried, on the ground that they did not think that either the learned judge or the witnesses had directed their minds to the real issue to be tried. The matter had accordingly been before Mr. Justice Kekewich again, and, after hearing the evidence, his lordship adhered to the view he took before, and granted for the second time a mandatory injunction. The defendant now appealed from that decision. He (counsel) said, in the first place, there was no cause of action at all for an injunction or for damages, and, secondly, that, even though the plaintiff might be entitled to damages, there was certainly no case for a mandatory injunction. The short facts were these: The plaintiff, a widow lady, lived with her daughter and son-in-law, and she owned a freehold house in Acton-road, Acton, and there was no doubt that her lights were ancient. The house had been built something over twenty years upon a plot which formed part of a building estate, where it was always contemplated building on the adjoining plots—one house to each plot. The defendant's plot was about 90 ft. wide. The defendant began to build about the latter part of 1902. His walls were almost completely up about February of 1903, and the plaintiff and the members of her family said that they felt the inconvenience, but they waited until April, 1903, when the walls were completely finished, before doing anything. It was said, with regard to that, that there had been an interview between someone representing the plaintiff and the defendant's architect, when something was said about the light, and that then the defendant's architect said he would take

care that plaintiff's light would not be injured. The architect completed the building, and he, at least, was still of opinion that the plaintiff's lights were not injured. Mr. Justice Kekewich took the view that the plaintiff was entitled to wait until the defendant's house was up to see if there was any injury done before coming to the Court. He (counsel) thought it was rather a novel proposition that a person could wait and see if he was injured before taking action for a mandatory injunction.

Lord Justice Vaughan Williams: Your case is that the plaintiff has lost her rights by believing what you said?

Mr. Hughes said the learned judge had found no actionable injury at all as regarded the light to the plaintiff's drawing-room. The main complaint was as to the light of the morning-room at the back—the north room in the plaintiff's house, which had one window looking towards the north and one towards the west, where the defendant's house was. Really, the only ground on which the learned judge had decided in favour of the plaintiff was in consequence of the injury done to the western window of the morning-room. That was a small room, some 13 ft. square, having two French windows, one looking north and the other west. The light was entirely unobstructed from the north-west, and really the obstruction was of a very slight character. The room was now admittedly well lighted. The witnesses admitted that it was, and the learned judge found that it was. As he (counsel) understood the decision of the House of Lords in the Colls case, it was a complete answer to the plaintiff's action. The plaintiff's morning-room had a much better light than such rooms usually had.

Lord Justice Vaughan Williams: Is it quite right to say that the House of Lords laid that rule down irrespective of the locality of the house?

Mr. Hughes: Not entirely, my lord. You, of course, apply different considerations to houses in town and to houses in the suburbs.

Lord Justice Vaughan Williams: Does the plaintiff say that she lives in town?

Mr. Hughes: No; in Acton.

Lord Justice Vaughan Williams: Well, I take it that Acton is in the country.

Mr. Hughes, continuing, said that the House of Lords had certainly laid down that, if a person had sufficient light for ordinary purposes, he had no ground for complaint. Here it was important to remember that the defendant's building plots fronting a suburban road, and everyone must have known it was intended to build houses in the road fronting one another. It was important to consider whether you could, in such a position, expect to have your light not interfered with.

Lord Justice Vaughan Williams: You say you have left to this lady quite as much light as she can expect?

Mr. Hughes: Yes; and all she can expect for ordinary purposes. I would go this length and say that, even as the law was understood before the decision in the Colls case, there was no substantial interference with the plaintiff's light at all. The learned judge found at the first trial, in case he was wrong as regards the mandatory injunction, that the damages would be 100*l.* for the morning-room and 50*l.* for the drawing-room. At the second trial he thought the damage to the morning-room alone was 400*l.* The whole house was bought for about 1,600*l.*

Lord Justice Vaughan Williams: There are people who would say they would not live in a dark house if they were paid to do so.

Lord Justice Romer: I can understand it being said that the plaintiff's house would be considerably more valuable if it should have no other house near it. The plaintiff must, however, admit that people were entitled to build so long as they did not interfere with the 45 degrees, to say the least of it. Therefore the damage can only be for the excess—damages for the wrong-doing.

Mr. Hughes agreed. He said the effect of the decision of the House of Lords in the Colls case was that the plaintiffs in that case, the Home and Colonial Stores, had no right to complain when, after the defendant's building had been erected, they had as much light as other people had in Worship-street.

Lord Justice Vaughan Williams: That is it exactly.

Mr. Hughes then read the judgment of Mr. Justice Kekewich, and referred at some length to the evidence given in the Court below.

After some further argument, Lord Justice Vaughan Williams, addressing the learned counsel, said that, as at present advised, the Court agreed in his contention that this was not a case for a mandatory order, and it would perhaps be convenient that Mr. Lawrence should be heard at once on the subject. Whether it was convenient to do so or not at that stage must depend more or less on the argument Mr. Hughes meant to address to the Court on the question of damages, and the

quantum of damages. The difficulty his lordship felt was this. If he had had to deal with the case himself he did not know how far he should have agreed, or how far he should have refused, on the decision of Mr. Justice Kekewich about the light to the morning-room. He was inclined to think that, notwithstanding the decision in the Colls case, he should have been more against the defendant as to the obstruction to the light to the drawing-room.

Mr. Hughes replied that, with respect, he thought it was impossible to say that the drawing-room had been injured.

Lord Justice Cozens-Hardy said his opinion was that, if the defendant's appeal had come on before the decision of the House of Lords in the Colls case was given, it would not have been a very hopeful one.

Mr. Hughes said that probably that would be so. If you could regard the west window of the drawing-room alone, it was probably more affected than the morning-room, because the obstruction was more immediately opposite to it. The learned judge had found that the morning-room was not originally well lighted before, and was even now well lighted. That came exactly within the ruling of the House of Lords in the Colls case. The House of Lords said, in effect, that what you had to look at was not what you took away, but the quantity of light left. Lord Davey said that the use of light for a special purpose did not give one a higher right than he would otherwise have had.

Lord Justice Vaughan Williams: Is there any authority before that for such a proposition?

Mr. Hughes: I do not think that had been much considered before that. But that does not come in question here, because there was no extraordinary amount of light required.

Lord Justice Vaughan Williams: But there is a question of a house in which the occupier may expect a reasonable amount of light, having regard to the fact that she lives in the open suburbs and not in the close town.

Mr. Hughes: I submit she has still got that. The only special user suggested by my learned friend, and adopted by the learned judge, was that this morning-room had very special value as a temple consecrated to the mental affections. It was really the least cheerful room in the house, and the smallest sitting-room, and it is very difficult to believe that it is of such immense value. The plaintiff's witnesses did not really dispute that the morning-room was still a well-lighted room. For these reasons I submit the judgment is erroneous, even on the findings of the learned judge, and should be discharged.

Mr. Lawrence, on behalf of the respondent, supported the judgment of Mr. Justice Kekewich. He said the learned judge had most carefully considered the evidence given on both sides, and before arriving at the conclusion he had done, had reserved his judgment. What his learned friend Mr. Hughes did, was to invite their lordships to reverse Mr. Justice Kekewich's decision on a pure question of fact. He submitted that the learned judge had not misdirected himself, and that this Court would shrink from reversing his decision on a pure question of fact.

Lord Justice Romer: Supposing we come to the conclusion that no mandatory injunction; then the judgment of Mr. Justice Kekewich must be attacked.

Mr. Lawrence replied that the plaintiff had said all along that she wanted a mandatory injunction. He submitted that the ruling of the House of Lords in the Colls case was meant to apply to the obstruction of light to business premises in the City or in towns.

There were cases which had gone to the House of Lords where it had been held that if the owner of the owner of a dwelling-house was materially disturbed by the obstruction of light, that constituted a nuisance. The first question in the present case was, aye or no, was there a nuisance established? He thought the Courts would have to draw a distinction between a nuisance to business premises and a nuisance to dwelling-houses. In the case of business premises the Court had to find out whether the nuisance was such as would prevent the plaintiff carrying on the business as beneficially as he had hitherto done. In the case of a dwelling-house the question for the Court to determine was, whether the occupants of the house had been interfered with by what had been done, and whether the building was in a sensible degree less fit for the purpose of occupation. The test was not as his learned friend had put it, whether there was sufficient light left. In the case of a dwelling-house it was no defence to say that the plaintiff had as much light as other people had.

After some further arguments, the learned counsel submitted that the question which the

Court had to decide was not how much light had been left to the plaintiff. The Court had not got to find out whether there was a standard of light to make a house comfortable. Supposing he (counsel) had a nice light library in a house in the suburbs, why should he be told, if some of his light was taken away, that it was not a nuisance because somebody else in another suburb had not got such a light room.

During the course of the learned counsel's address, a suggestion came from their lordships that the parties should endeavour to come to settlement of the whole litigation. They said that the case was one of great difficulty.

Mr. Lawrence replied that, if the Court thought that the plaintiff's claim ought to be reduced to a claim for damages, and that the mandatory injunction should be discharged, he would agree to that course, and leave it to their lordships to say what the damages should be. That offer, of course, was given on the understanding that the whole of this litigation was permanently ended, and that the defendant should pay all the costs of the two trials and of the two appeals. He also made an alternative offer that, instead of damages, the defendant should alter his house by taking off 18 in. from the top of the gutter-board, that was to say, that the roof was to be sloped down, and the two chimneys removed. He was informed that the chimneys could be sloped up so as to come more into the middle of the house, and not be on the outside wall.

It was arranged that the defendant should have until the next morning to consult his counsel on this offer.

On Thursday Mr. Hughes stated that the defendant had considered the proposal made by his learned friend Mr. Lawrence, and he had come to the conclusion that he could not accept his offer.

Their Lordships intimated that, as that was so, the arguments must proceed.

Mr. Cann, following Mr. Lawrence, on behalf of the respondent, submitted that his client was entitled to a mandatory injunction. He argued that damages were not an adequate remedy in this case.

Mr. Hughes then replied on behalf of the appellant. The learned counsel, during the course of his address, apologised for taking up so much of their lordships' time, but he said the case had now become a most important one.

Mr. Hughes had not concluded his reply when we went to press.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

25,430 of 1903.—W. WRIGHT: *Water-Closets, Commodes, Bed-pans, and the like.*

Water-closets, earth-closets, urinals, commodes, bed-pans, and like utensils or appliances which consist in the employment of a foul air exhaust pipe or shaft connected direct to the bowl of the closet or other utensil or appliance and by which the foul air and stench is continuously removed during the actual use of such urinal or appliance.

25,874 of 1903.—J. PEARSON: *Hoisting Apparatus.*

A hoisting apparatus, consisting of a pinion having connected to it a disc furnished with teeth, inclined planes or cams adapted to engage corresponding teeth, inclined planes or cams on a disc loosely mounted on the pinion shaft in such a manner that the rotation of the pinion in one direction causes the pinion and loose disc to move sideways into contact with friction discs.

27,490 of 1903.—J. I. COOPER: *Domestic Fire Grates.*

This invention consists of a series of staple secured in rotation to a bar in an upright position; these form a grate for the purpose of fitting inside or outside of the fire grate to prevent cinders rolling out of the fire, the whole being made from wrought iron or the like, and being bent by the user to suit any shaped fire grate.

27,918 of 1903.—J. BLANC: *Pipes, Vessels, Tiles, and similar Articles.*

Pipes and other articles of paste-board or wood pulp, saturated with a hot mixture of coal tar previously raised to a high temperature, or other similar material having a base of mineral resin and plaster or cement.

28,804 of 1903.—R. MURRELL: *Greenhouses and like Buildings.*

This invention relates to greenhouses and like buildings. According to this invention, the greenhouse is preferably constructed with

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

span roof upon an iron framework, chiefly of a suitable joined up and so arranged that the framework shall support the sash bars preferably without any centre uprights or timber pultrils, and this is contrived by a system or series of stays and cross-bars, also of tubing, secured in tee pieces or by other suitable means, to the framework. This tubular framework is fitted with back nuts or other suitable means, and is so arranged and adjusted as to counteract and prevent any possibility of warp, twist, or vibration. The tubing, being in whole or part connected to the heating apparatus, is so arranged that it may form an additional circulatory and heating apparatus for the house.

70 of 1904.—J. W. PIPER: *Grates for Stoves and Furnaces.*

The combination of a grate, consisting of a grate ring and a series of grate bars having laterally-curved, tapering bodies, pivoted at their larger ends at equal intervals on said ring, each of said bars being provided on its outer side with a wing adapted to overlap the next bar to prevent the escape of fine fuel between adjacent bars when the same are in operative position, and means for swinging said bars simultaneously toward or away from the centre of said ring.

331 of 1904.—A. E. WHITEHEAD and H. J. McCHEYNE: *Stoves.*

The stove consists of an exterior, ornamental or plain frame, with an interior or fire box, movable, and revolving on two pivots slotted into the exterior and having its axis horizontal. When the interior, or fire box, is revolved by pulling up the bottom to the top, it so reverses the interior by bringing the back to the front, and on the back there is an ornamental casting, which, when revolved and brought to the front, closes in the fire place and forms an ornamental screen. There is a movable hood, which is fitted over the interior or revolving fire box, also slotted into the exterior, which regulates the draught as required, and also provides for the efficient ventilation of the room when the interior is revolved or closed in, and leaving an aperture over the top of the interior or revolving fire box to be regulated as required for a current of air.

722 of 1904.—H. LOSSIER: *Trusses for Cement and like Constructions.*

A truss for cement and like constructions, comprising a main truss bar or bars for extension or compression, and a number of cross-bars forming a secondary truss (shear truss), the cross-bars being rigidly connected to at least one of the main bars in such a manner as to prevent displacement of the truss with regard to the corresponding main bar without the aid of the surrounding material and without decreasing the cross section of said main bar.

811 of 1904.—T. BEEVERS and THE SAFETY THREAD SYNDICATE, LTD.: *Mode of Constructing Staircases.*

A method of constructing staircases which consists in building into the walls metal blocks or plates having a roughened or corrugated outer side and adjustably fixing thereto correspondingly corrugated brackets to receive either temporary or permanent treads.

946 of 1904.—E. FOSTER: *Construction of Unclimable Fencings, Railings, Gates, Grilles, and the like.*

This relates to the construction of unclimable fencings, railings, gates, grilles, and the like, consisting in the employment of such double-flanged sections and dimensions of bars forming the component parts of the same, that the bars running in one direction may be passed through suitable holes in both flanges of the bars running in a transverse direction, so as to allow of the bars being locked together, without the aid of rivets, bolts, wedges, or other loose fastenings, by pressing outwards or otherwise distorting the flanges of the inserted bar between the flanges of the transverse bar.

1,065 of 1904.—T. G. RHODES and R. GAUNT: *Valve Discharge Apparatus for Flushing Cisterns.*

A valve discharge apparatus for flushing cisterns, consisting of a vertical, cylindrical casing formed with a side outlet, pipe communicating with the flushing pipe of the cistern, said casing being closed at its upper end, while its lower or open end is provided with a base ring having an upturned, annular flange forming a valve seating and a weighted disc valve within the casing, having an india-rubber disc on its underside adapted to engage with the seating of the casing, together with means for operating the valve.

5,253 of 1904.—W. A. SIMPSON: *A Ventilating Appliance for Windows.*

A portable ventilating appliance for windows, furnished with hand hooks or the like, and

arranged to be removably introduced between the window frame and the top or bottom sash, and provided with a ventilating chamber

14,963 of 1904.—M. MENDOZA: *Flushing Apparatus for Water-closets, Lavatories, and the like.*

A flushing apparatus for water-closets, lavatories, and the like, comprising a casing having a water inlet and a water outlet, a valve adapted to close said water outlet, and means for unseating said valve, in combination with an air inlet tube and a valve for automatically closing said tube when the water level reaches same.

16,591 of 1904.—G. HARMAN and J. WING: *Holdfasts or Clips for Roofing Gutters.*

A small iron clip made of any strong metal in the shape of an S, the upper part being opened upwards so as to grasp the roofing gutter. The upper end is pierced with a hole to admit of the passage of a screw, which passes over the top of the gutter and is fixed into the wood under the roof, thus holding the gutter in a rigid and firm position. The object of these clips is to reflex roofing gutters which are or are likely to become dangerous at a small cost and with expedition.

19,376 of 1904.—S. MONTGOMERY: *Picks.*

A pick, consisting in the combination with a lead having an arm, and a socket in one end of said arm, said socket having one wall cut away to form a slot, of a bit adapted to abut against the arm, and having a tongue integral with and extending from said bit, said tongue fitting snugly within the said socket and slot, and means for securing the tongue within said socket.

20,240 of 1904.—F. A. WERNER: *Attachment for Window Sashes.*

An attachment for window sashes, comprising in combination, a resilient sheet-metal strip of step-like form, disposed longitudinally of the bottom rail of the sash, transverse strengthening straps, and screws passing through the said transverse straps and said strip, and entering the sash rail.

21,871 of 1904.—C. WRIGHT: *Fireplaces for Ranges and Stoves.*

A fireplace for ranges and stoves, distinguished by having the bottom grate pivotally mounted at or near its inner end upon rockers or arms, pivoted to the side of the fireplace, and being supported at its outer or front end by legs which fit upon projections or catches formed in grooves or hooks on the front of the fireplace.

21,999 of 1904.—A. GASPARY: *Moulding Apparatus for Artificial Stone.*

An apparatus for simultaneously moulding a number of artificial stone slabs, the distinguishing feature being that the division plates which are swung in a mould that is open at both ends are mounted to rotate on a single shaft supported by lever arms pivoted on the mould.

22,121 of 1904.—J. DAVEY: *Domestic and other Analogous Heating Apparatus.*

A domestic or analogous water-heating apparatus, having a hot-water cylinder or reservoir, consisting in the employment of a relief valve contrivance, fixed upon the said cylinder or reservoir.

960 of 1904.—A. DISS: *Drain, Rainwater, and other Pipes, Sanitary Traps, Junctions, and the like, Applicable also to Gullies, Channels, Guttering, and the like.*

A drain, rainwater, gas, or like pipe section of telescopic construction, and comprising a sleeve and a draw pipe slidable therein, the outer ends of the sleeve and draw pipe being adapted for connexion with adjacent pipe sections, traps, junctions, or the like, and that end of the sleeve in a mould that is open at both ends are mounted to rotate on a single shaft supported by lever arms pivoted on the mould.

1,350 of 1904.—W. BAYLIS: *Construction of Wood Paving and Flooring Blocks, and Fasteners for Securing Together Component Parts of such Blocks.*

A wood paving or flooring block, built up of a number of smaller pieces placed side by side vertically, of which some of the pieces are shorter than others, and are assembled therewith in a manner which leaves a number of depressions in the upper surface of the block.

11,944 of 1904.—W. P. THOMPSON (M. J. Kerns): *Apparatus for Shoring to be used in Connexion with the Construction of the Foundations of Buildings, Piers, and other Structures, and the like, and the Sinking of Wells, Shafts, and the like.*

A shoring apparatus, comprising plates which can be sunk side by side and at opposite sides

of the cavity in the earth, said plates having a solid round edge or bead engaging a socket or slot in the edge of the adjacent plate so as to lock them together and collectively form a shoring or wall, in combination with stretcher stays and cross stays so arranged as to bind the plates on either side of the cavity secured together, and prevent them from collapsing or expanding.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 3.—By W. J. MAY & SON (at Luskard).

St. Neot, Cornwall—"Kilham" and 36 a. 2 r. 8 p. f.	855
Westerlake Estate, 140 a. 1 r. 6 p. f.	1,025
"Maddlake Estate," 66 a. 0 r. 15 p. f.	401
"Browningly Down," 92 a. 2 r. 17 p. f.	200
New Cluses Estate, 131 a. 1 r. 17 p. f.	525
Redhill Downs, 100 a. 3 r. 39 p. f.	200
Draynes Common Close, 193 a. 1 r. 20 p. f.	200
Under Lane Field, 3 a. 31 p. f.	140

December 5.—By CECIL HOBDAV.

Putney.—S. Putney-hill, l. p.	2,950
Shepherd's Bush.—16 and 48, Arundel-rd., ut. 76½ yrs., r.r. 122, 12s., y.r. 70L.	755
Kenish Town.—10, Twickenham-rd., ut. 69 yrs., g.r. 6L, y.r. 35L.	385
Pinchick.—14, Westmoreland-st., ut. 29 yrs., g.r. 7L 10s., y.r. 42L.	305

By H. J. WAY & SON (at Cowes).
Cowes, Isle of Wight.—Mary-st., William the Fourth, p.h. and cottage adjoining, l. p.

December 6.—By DEBENHAM, TAYSON, & CO.

City of London.—18 and 19, London-wall ("Rayment's Hotel"), area 2,680 ft. l. p. 5, Foster-lane (s.), area 490 ft. l. y.r. 180L.

By C. W. DAVIES & SON.

Islington.—S. Copenhagen-st. (s.), ut. 144 yrs., g.r. 4L, y.r. 65L.	130
57, Copenhagen-st. (s.), l. y.r. 60L.	650
8, Milner-st., ut. 22½ yrs., g.r. 9L, er. 65L.	310
Barbours.—1, 2, and 3, Charles-st., ut. 59 yrs., g.r. 18L, w.r. 12L 16s., y.r. 30L.	320
15, Everida-st., ut. 39 yrs., g.r. 8L, y.r. 30L.	375
Canonbury.—4, Canonbury-gt., ut. 134 yrs., g.r. 6L 10s., y.r. 38L.	145
Kilburn.—Palmerston-rd., lgr. 25L 4s., ut. 58½ yrs., g.r. nil.	435
Caledonian-road.—Kreeling-st., lgr. rents 40L, ut. 39½ yrs., g.r. 4L.	560
Dulwich.—217, Plow-rd., l. g.r. 70L.	810

By HUNTER & HUNTNER.
South Kensington.—Ennismore-gdns., lgr. rents 112L, ut. 38½ yrs., g.r. 16L.

Ennismore-gdns., lgr. rents 70L, reversion in 38 yrs.

Belgravia.—Lowndes-st., lgr. 65L, ut. 24 yrs., g.r. 10L.

Hyde Park.—Westbourne-crees, lgr. rents 77L, ut. 33 yrs., g.r. 2L.

45, Sussex-gdns., ut. 32½ yrs., g.r. 15L, p.r. 1,570.

By FREDK. WARMAN.
Highbury.—37, Balfour-rd., ut. 45 yrs., g.r. 6L 6s., y.r. 40L.

43, Libenham-rd., ut. 84 yrs., g.r. 7L 10s., er. 44L.

11, Compton-rd., ut. 41 yrs., g.r. nil, er. 60L. De Beauvoir Town.—102, De Beauvoir-rd., ut. 17 yrs., g.r. 4L 10s., y.r. 32L.

By BARBER & SON (at Shifnal).
Shifnal, Salop.—"Idéal House" (a. & 3 r. 15 p. f., y.r. 70L.

The "Park Farm," 38 a. 2 r. 1 p. f.

The "Cottage" and 0 a. 2 r. 33 p. f., y.r. 25L.

The "Lodge Hill Farm," 241 a. 1 r. 19 p. f., December 7.—By FOSTER & CRANFIELD.

Hammersmith.—Sinclair-rd., lgr. rents 45L, reversion in 71 yrs.

25 and 27, Girdlers-rd., ut. 61 yrs., g.r. 4L, y.r. 115L.

Bethnal Green.—32, Bethnal Green-rd. (s.), ut. 55 yrs., g.r. 45L, y.r. 230L.

By WALTER HALL.
Willesden Green.—Market-pl., lgr. 54L, reversion in 94 yrs.

By W. MAURICE-JONES.
Finchley.—36, Derby-av., ut. 96½ yrs., g.r. 5L 5s., er. 28L.

By MAX LEE & SON.
Limehouse.—Galt-st., cgr. 5L, reversion in 10 yrs.

Canning Town.—217, Barking-rd., l. y.r. 54L. East Ham.—73, Central Park-rd. (s.), l. y.r. 35L.

375. Bow.—11, Malmesbury-rd., ut. 67 yrs., g.r. 4L, y.r. 30L.

46, Wellington-rd., ut. 59 yrs., g.r. 3L, w.r. 33L 18s.

Manor Park.—20 and 22, Durrant-rd., ut. 52 yrs., g.r. 8L, y.r. 47L.

By WILLIS, CROUCH, & LEE.
De Beauvoir Town.—162 and 164, Hertford-rd., ut. 43 yrs., g.r. 22L, y.r. 72L.

395. Fulham.—91, Bishop-rd. (s.), l. y.r. 45L.

335. Norwood.—49 and 51, Alexanders-rd., ut. 50 yrs., g.r. 11L 10s., y.r. 73L.

445. By WYATT & SON (at Chichester).
Fishbourne, Sussex.—"Langley Cottage," 3 a. 0 r. 21 p. c, p.

670. South Bersted, Sussex.—"Four Acres Town Cross," 3 a. 3 r. 13 p. f.

700. Yapton, Sussex.—"Simpson Croft," 1 a. 2 r. 8 p. f.

410. December 8.—By J. BARTON & CO.
Notting-hill.—50, Wheatstone-rd., ut. 61½ yrs., g.r. 8L, w.r. 41L 12s.

345. Enfield Highway.—1 to 10, George's Cottages, ut. 73 yrs., g.r. 25L, w.r. 106L 12s.

280.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Table with 5 columns: Nature of Work, By whom Required, Premiums, Designs to be Devised, and Date. Includes entry for 'Designs for School, etc., at Caversham' by County of Oxford Education Comtee.

CONTRACTS.

Main table with 5 columns: Nature of Work or Materials, By whom Advertised, Forms of Tenders, etc., supplied by, and Tenders to be Devised. Contains numerous entries for construction projects across various locations like Bradford, Glasgow, Plymouth, and London.

CONTRACTS.—Continued.

Table with 4 columns: Nature of Work or Materials, By whom Advertised, Forms of Tender, etc., supplied by, and Tenders to be Delivered. Includes entries for Dwelling House at Ringmore, Shaldon; Five Labourers' Cottages, Monastery, Powerscourt; One Cottage, Glaskenny, Powerscourt; Two Cottages, Kilmalin, Powerscourt; One Cottage, Fassava, Delgany; 800 tons of Quenast, etc.; Steam Boilers, etc.; Heating of Pavilions, etc.; Electric Light Installation; Extension of Waterworks, Bettwa-y-Coed; Embankment, etc., at Fynon Llwyg; Finishing Machine, Ruchill Wash-house, Fossilpark; Rebuilding Ship Hotel, Crane-street, Pontypool; Roadworks, Colechester; Additions, etc., to Lock-up, Aspatria; Pull Down & Re-erect, Masham Restaurant, Bradford; Restoration of Church, Wanborough, Wilts.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Applications to be in. Includes entries for Surveyor's General Assistant, Assistant Superintendent of Works, Two Senior Draughtsmen, and Clerk of Works.

Those marked with an asterisk (*) are advertised in this number. Competitions, iv. Contracts, iv, vi, viii, x. Public Appointments, xix.

TENDERS.—Continued from page 649.

HARROGATE.—For street works in roads off Otley-road and Bower-road, for the Corporation. Mr. F. Jagshaw, Borough Engineer and Surveyor, Harrogate. Quantities by Engineer.—

Roads off Otley road. E. Long, 5, Albert-terrace, Starbeck*. £879 12 6. Back Road at rear of Nos. 4 to 34, West Terrace-avenue. G. Parsons, Harlow Hill, Harrogate*. £275 8 10.

Roads off Bower-road. Barker & Co., Lower-arcade, Harrogate*. £211 7 2.

HENSTRIDGE (Somersetshire).—For 720 yds. of cast-iron mains. Mr. Cyrus Combes, engineer, Tisbury.—

S. Ambrose... £303 0 0 Smith & Mar- W. H. Smith & Son... 195 19 0 chant, Shep- P. Tryhorn & Son... 195 19 0 ton Mallett. £178 5 6

KILMARNOCK.—For waterworks, for Kilmarnock District Committee. Mr. J. Sturrock, jun., engineer, Victoria Buildings, 65, King-street, Kilmarnock.— Murray & Milne, Prestonpans*. £2,920 0 6

IPSWICH.—For erecting at the workhouse, Wood-bridge-road, a temporary iron structure, for the (Canadian) Messrs. Brown & Burgess, architects, Princess-street, Ipswich.

For Iron Structures. Fenn & Co., Ipswich... £321

Messrs. Fenn will also provide the drainage, lighting, heating, and water supply, and other matters not included in the specification at an estimated price of £793.

KING'S NORTON.—For private street works, Ashfield-avenue, King's Heath, and Kitchener-road, Selly Wick, for King's Norton and Northfield Urban District Council. Mr. A. W. Cross, surveyor, 23, Valentine-road, King's Heath.—

J. White, jun., Boulton-y-Ashfield-avenue... £548 11 8. J. Kitchener-road... £320 19 6

LARNE (Ireland).—For erecting a library at the corner of Victoria-street and Thordale-avenue, for the Urban District Council. Mr. N. Fitzsimons, architect, 13, Lombard-street, Belfast. Quantities by Messrs. W. H. Stephens & Son, Belfast.—

McRoberts & H. Keth... £2,162 0 0. Armstrong... £2,240 0 0. W. McNeill & Sons... 2,152 11 7. J. Ferris... 2,236 10 0. J. Less... 2,295 0 0. W. Dowling... 198. Crom-well-road, Belfast*. 2,020 0 0. T. Kidd... 2,176 11 6. J. McMillan... 2,165 0 0.

LEYTONSTONE.—For alterations and improvements to the Gann Hall-road Schools (Wanstead Slip), for the Education Committee of Leyton District Council. Mr. W. Jacques, Architect, 2, Pen-coat, Fenchurch-street, E.C.3.—

Osik Building Co., Ltd... £2,499 0 0. G. J. North... 1,569 0 0. W. Wisdom Bros... 1,939 0 0. R. Woolston & Co... 2,249 0 0. F. J. Coxhead... 1,717 0 0. A. J. Shephard... 2,230 10 8. W. Gregar... 1,675 0 0. E. W. Harris & Co., Ltd... 2,097 0 0. A. E. Symes... 1,633 0 0. H. M. Upson... 2,085 0 0. H. C. Horswill... 1,613 0 0. H. M. Patrick... 1,943 0 0. W. J. Maddison... 1,509 0 0. Simpson & Co... 1,897 0 0. W. Manders... 1,885 0 0. L. Kind... 1,885 0 0. W. J. Weyman... 1,487 0 0.

LONDON.—For repairs to Nos. 1 to 24, Knott's-terrace, Tanner's-hill, Deptford, and 47, Tanner's-hill, for the Deptford Borough Council. Mr. T. Corfield, Borough Surveyor, 493, New Cross-road, S.E.1.—

P. J. Lilford, 16, Alpha-road, New Cross, S.E.1... £183 14

LONDON BOARD OF EDUCATION TENDERS.

Haggerston, Gapsall-street (Cleaning).

(First Competition.) G. S. S. Williams & J. Stewart... £295 5. Son... £450 0. J. Grover & Son... 283 0. H. Runham Brown... 441 0. J. Marchant & Hirst... 261 0. W. Silk & Son... 303 0. R. Woolaston & Co... 210 0. C. Deaning & Son... 304 5.

(Second Competition.) G. S. S. Williams & J. Stewart... £272 0. Son... £450 0. H. Boucaut, 1A & H. Runham Brown... 441 0. 2, Royal Victor- J. Stewart... 295 5. place, Old Ford* 233 0. W. Silk & Son... 291 10.

Walworth, "Michael Faraday" (Cleaning during Easter Holidays, 1905).

T. L. Green... £296 0. H. J. Williams... £206 13. Maxwell Bros., Ltd... 241 10. J. & C. Bowler... 296 0. W. V. Goad... 238 0. Rice & Son, 15A, W. Sayer & Son... 212 0. Stockwell-road* 202 0.

Camberwell, N., Leipsic-road (Cleaning interior).

(a) That the resolution accepting the tender of Mr. W. Read, amounting to £197, for cleaning the interior of the Leipsic-road school, be rescinded.

(b) That the tender of Messrs. Maxwell Bros., Ltd., amounting to £229, for cleaning the interior of the Leipsic-road school during the Christmas holidays, be accepted.

Islington, E., Highbury Truant School (Heating apparatus, etc., for sanatorium bath and gymnasium).

J. Yatton & Co... £504 0. Brighstide Foun- W. C. Cannon... 499 0. try & Engineer- J. Grundy... 497 0. ing Co., Ltd... £384 0. Wippell Bros. & Strode & Co... 383 0. Row... 437 0. J. Richmond & Co., Ltd., 30, Kirtly- st., Batton-gdn.* 371 15.

Mackey, S., Brunswick-street (School for mentally defective children).

Todd & Newman... £4,937. Clarke & Braeay... £3,664. Marchant & Hirst... 4,150. W. Shurmer & Sons... 3,636. G. Neal... 4,190. Ltd... 3,544. W. M. Dabbs & Son... 4,158. J. Grover & Son... 3,544. A. Porter... 4,155. Patman & Fother- Kilby & Gayford... 4,141. ington, Ltd... 3,516. McCormick & Sons... 4,038. J. & M. Patriick, J. Simpson & Son... 3,940. Point Pleasant, L. Lawrence & Sons... 3,802. Waudsworth*... 3,461. E. H. & R. Roberts... 3,473.

[The architect's estimate comparable with these tenders is £3,485.]

LONDON.—For erecting a museum building at the rear of the Public Library, Walworth-road, S.E.1, for the Southwark Borough Council. Mr. Arthur Harrison, Borough Engineer, Town Hall, Walworth-road, S.E.1.—

Patinson & G. Parker... £1,601 4 4. Sons... £1,964 0 0. J. Smith & Sons, Ltd... 1,569 0 0. J. W. Jer-rom... 1,833 0 0. General Bul- Blyton & Sons... 1,816 15 0. W. Walsby... 1,504 11 1. A. Hudson & Co... 1,760 0 0. incale... 1,490 0 0. F. & H. F. Higgs... 1,731 0 0. R. & E. Evans... 1,421 13 8. J. Marsland & Sons... 1,658 0 0. G. J. Newton, Astley & Starmar... 1,644 0 0. Southwark W. E. West- W. J. Ren-shaw... 1,626 0 0. gate... 1,274 0 0. Gouch & Co... 1,621 0 0.

LLANDYRI.—For enlargement and renovation of Llandyri Church, for the Rev. David Jones. Mr. W. Griffiths, architect, Llanelly. Quantities by architect.—

D. Williams... £450. P. Phillips, Trim- T. Evans & Sons... 430. & Co... £350. T. P. Jones... 430.

LONDON.—For constructing about 1,817 ft. lineal of new roads, etc., for the owners of Orange Hill Estate, Edgware. Messrs. Pollard & Tingle, engineers, 31, Old Queen-street, Westminster, S.W. Quantities by engineers.—

A. B. Champ-nis... £2,692 13 7. F. Fowles... £2,177 18 5. T. W. Pedrette... 2,677 9 10. W. Halsay & Son... 2,131 10 2. W. Stevens... 2,651 15 7. M. S. Kitter- do... ingham... 2,100 0 0. J. Dickson... 2,550 0 0. H. Williams... 2,069 2 0. B. Nowell & Co... 2,416 0 0. T. Wakon, jun... 2,045 17 11. Wilkinson Bros... 2,409 0 0. S. Kavanagh & Co... 1,983 0 0. J. H. Harny & Co... 2,388 1 6. W. Neave & Son... 1,957 0 0. T. W. Marsh... 2,377 10 2. R. Bullard, G. Wimpy & Co... 2,318 10 0. Ltd... 1,937 0 0. C. W. Killing- back & Co... 2,193 18 7. T. Adams... 1,846 9 9.

LONDON.—For pulling down and rebuilding a Hop Warehouse on the site of Nos. 46 and 48 Red Cross-street, Southwark, S.E.1, for Mr. Alex. P. Haig. Mr. George A. Lansdown, architect, 9, Regent-street, Waterloo-place, S.W.—

J. Mowlan & Co... Kirk & Kirk... £3,566. Ltd... £9,450. T. G. Sharpington... 8,578. H. Burman & Sons... 9,283. H. L. Holloway... 8,462. C. Angus... 9,173. R. & E. Evans... 8,317. H. & E. Lea... 8,990. W. Dewar... 8,199. J. Marsland & G. Newton... 8,195. Sons... 8,935. Johnson & Co... 8,175. Battley, Sons & B. E. Nightingale... 7,782. Holness... 8,827.

MERTHYR.—For private street works at Ernest-street, Plymouth-road, for the Merthyr Tydfil Urban District Council. Mr. P. F. Harvey, Surveyor to Council.—

J. F. Seal... £136 12 7. L. Griffiths... £127 0 10. M. L. Jenkins... 134 0 0. Jones & Davies... 117 19 6. E. Vans & J. Evans... 113 12 1. Waters... 130 12 1.

MIDDLETON.—For alterations and additions, etc., at Middleton Tower, Norfolk. Mr. H. J. Green, architect and Diocesan Surveyor, 31, Castle-meadow, Norwich.—

J. Kinnin-mont & Son... £6,483 0 0. Tash, Lang- J. Cracknell... 5,449 0 0. ley & Co... 4,804 3 6. J. S. Smith... 5,328 14 4. A. F. Fore- R. Day... 5,024 0 0. man, King's J. Young & Lyant... 4,692 12 11. Son... 4,937 0 0.

RADCLIFFE-ON-TRENT.—For erecting shops, assembly hall, stores, etc., for the Co-operative Society. Messrs. A. R. Culvert & W. R. Glave, architects, Low Pavement, Nottingham.—

W. Hicking, Radcliffe-on-Trent* £1,473 15 2. [Highest of sixteen tenders, £1,935; lowest, £1,461.]

REIGATE (Surrey).—For the erection of Collev Cottage. Mr. Money Marsland, architect, 68, Great Tower-street, E.C.4. Quantities by the architect.—

Marsland & Sons... £4,385. Maddison... £4,159. Bagaley & Sons... 4,300. Minter... 4,157. Dolman & Co... 4,250. Buckland & Waters* 4,064.

RIDGEWAY.—For erecting a house, High-lane, Ridgeway, near Kilmarnock, for Mr. P. Martin, son of Mr. E. Allsopp, architect, Workop. Quantities by architect:—
 Carpenter & Co. £895 0 0
 C. Leverton .. 800 0 0
 J. Hindley .. 777 0 0
 Hiett & Sons .. 755 0 0
 G. Wright .. 747 0 0
 Howles Bros .. 703 12 0
 L. Pidler & Sons .. 675 0 0
 Binder Bros. & Boul .. £658 0 0
 J. Drabble .. 631 10 7
 J. Holmes .. 625 4 0
 W. Hemstall .. 624 7 10
 Belover Bros. .. 583 0 0
 H. Fidler .. 565 14 0
 J. Staveley & Co. 560 0 0
 Lind & Swann, Eokington, .. 560 0 0

ROSS.—For erecting a board room, etc., at the Union Workhouse for the Guardians. Mr. A. H. Pearson, architect, Ross. Quantities by architect:—
 George Hill, Leisbury, Herefordshire .. £788 17
 [Four other tenders.]

SELBY OAK.—For erecting public baths, Tiverton-road, for King's Norton and Northfield Urban District Council. Mr. A. W. Cross, Surveyor and Engineer, 23, Valentine-road, King's Heald. Quantities by architect:—
 T. A. Cole & Son, Selby Oak, near Birmingham .. £8,990

SOUTHALL.—For surface water drain, North-road, for the Southall-Norwood Urban District Council. Mr. R. Brown, Engineer and Surveyor, Public Offices, Southall. Quantities by Engineer:—
 G. Hirst & Sons .. £264
 F. Smith .. 228
 Killingback & Co. .. 202
 R. Spencer .. 201
 H. Morecroft .. 197
 T. Free & Sons .. £186
 A. & B. Hanson .. 181
 J. Jackson .. 181
 W. H. Wheeler .. 166
 T. Watson, Southall* .. 155

SOUTHALL.—For sewerage and surface water drainage, Dorners Wells-lane, for the Southall-Norwood Urban District Council. Mr. R. Brown, Engineer and Surveyor, Southall. Quantities by Engineer:—
 G. Hirst & Sons .. £2,002
 Killingback & Co. .. 1,958
 Foster Bros. .. 1,628
 R. Morecroft .. 1,618
 W. H. Wheeler .. 1,608
 H. Morecroft .. 1,528
 T. Free & Sons .. £1,523
 A. & B. Hanson .. 1,517
 J. Jackson .. 1,353
 T. Watson .. 1,316
 Southall* .. 1,136

SOUTHALL.—For sewerage and surface water drainage, Western-road, for the Southall-Norwood Urban District Council. Mr. R. Brown, Engineer and Surveyor, Public Offices, Southall. Quantities by Engineer:—
 Killingback & Co. .. £1,170
 H. Morecroft .. 837
 Foster Bros. .. 803
 G. Hirst & Sons .. 798
 R. Spencer .. 790
 T. Free & Sons .. 751
 J. Jackson .. £744
 W. H. Wheeler .. 699
 T. Smith .. 635
 T. Watson, Hin .. 654
 A. & B. Hanson .. 647

SWANLEY (Kent).—For new stone accumulation at White Oak School, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—
 J. J. Richards .. £490 0
 Morley & Myer .. 370 0
 T. Pearce .. 345 18
 T. Cole .. 317 18
 Gardner & Hazell .. 299 0
 A. W. Jaggors .. 285 0
 J. Lansdale .. £284 0
 T. Knight .. 281 0
 W. & D. Wilkins .. 260 0
 B. W. Ghenny, Romford* .. 252 0

UPMINSTER, BORNCHURCH, AND CRANHAM.—For 3,200 ft. of granite kerb, for the Romford Rural District Council. Mr. G. Lapwood, Highway Surveyor, Victoria-road, Romford:—
 British Pricing & Granite Co. .. £735 0 0
 T. W. Marsh .. 320 13 9
 J. W. Logan .. 313 6 8
 W. E. Westgate .. 282 15 0
 Wilson, Borden, & Co. 275 10 0
 R. A. Bonnett, .. £273 6 8
 A. W. Porter .. 246 13 4
 J. Jackson .. 265 0 0
 P. Inland .. 260 0 0
 B. W. Ghenny, Romford* .. 253 5 0

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 J. & W. Lowry .. 15,875 0 0
 R. Veitch & Son .. 15,368 0 0
 E. T. George .. 15,200 0 0
 T. Lumsden .. 15,200 0 0
 Davidson & Bolam .. 15,040 14 10
 S. P. Davill .. 14,995 0 0
 Elliott Bros. .. 14,990 13 0
 W. Kennedy .. 14,905 0 0
 R. Smith .. 14,504 0 0
 J. C. Hope .. 14,716 4 2
 R. C. Whitfield .. £14,603 13 10
 N. Ritchie .. 14,600 0 0
 Glen .. 14,553 9 1
 S. Sheriff .. 14,503 14 6
 J. Mackarg .. 14,447 10 6
 W. Hall .. 14,402 6 2
 J. W. Braithwaite .. 14,262 10 9
 J. & W. Simson .. 14,135 0 0
 G. Bain .. 14,052 0 0
 J. Hunter .. 13,999 5 0
 J. & G. Douglas .. 13,842 11 7
 W. T. Weir .. 13,831 0 0

WOODFORD (Essex).—For main road works (Contract No. 1), for the Urban District Council. Mr. W. Farrington, Surveyor, Council Offices, Woodford Green:—
 W. J. Logan .. £3,124 0 0
 T. W. Marsh .. 2,680 16 7
 T. Adams .. 2,573 13 7
 E. Rogers & Co. 2,563 0 0
 Moss & Sons .. 2,525 0 0
 W. Griffiths & Co. 2,508 3 6
 O. T. Gibbons .. £2,442 0 0
 Free & Sons .. 2,406 11 0
 Parsons & Parsons .. 2,387 12 7
 W. & C. French, Buckhurst Hill .. 2,360 4 4

WOODFORD (Essex).—For road improvements (Contract No. 2), for the Urban District Council. Mr. W. Farrington, Surveyor, Council Offices, Woodford Green. Quantities by Surveyor:—
 W. J. Logan .. £1,595 0 0
 T. W. Marsh .. 1,303 15 0
 W. Griffiths & Co. 1,290 0 7
 T. Adams .. 1,273 9 0
 Free & Sons .. 1,260 11 1
 O. T. Gibbons .. 1,191 0 0
 Moss & Sons .. 1,190 0 0
 Parsons & Parsons .. £1,165 5 8
 E. Rogers & Co. 1,143 0 0
 W. & C. French, Buckhurst Hill .. 1,125 0 9

WRENTHAM.—For 290 yds. of 9-in. stoneware sewer, etc., for the Rural District Council. Mr. J. Price-Evans, C.E., Argyle Chambers, Wrentham. Quantities by Engineer:—
 G. Halbert .. £159
 T. Rogers .. 159
 E. Robinson .. 149
 W. Barwick .. 145
 J. A. Jones .. £136
 R. Williams .. 134
 T. H. Shumons, Gwryll, Wrentham* .. 108

WRENTHAM.—For metalting and making good Edward-street, for the Corporation. Mr. John England, Borough Surveyor. Quantities by Surveyor:—
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 W. Hughes .. 224
 H. A. Jones .. 185
 J. W. Harris, Shrewsbury* .. £130

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The Builder.

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DECEMBER 24, 1904.

ILLUSTRATIONS.

A Christmas Vision; after Tennyson.....Drawn by Mr. A. C. Conrade.
Interior, St. James's, Piccadilly (R.A. Prize Drawing).....	.....Drawn by Mr. Leslie Wilkinson.
New Grammar School, Marlborough.....	Messrs. Silcock & Reay, Architects.
Holy Trinity Church, Southport.....	Messrs. Matear & Simon, Architects.
Rectory, Oxted, Surrey.....	.....Mr. C. M. Oldrid Scott, Architect.
Memorial Gateway, Monton Church, Manchester.....	Messrs. T. Worthington & Son, Architects.

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A Note on Street Architecture.



THE paper on "Street Architecture" read by Mr. T. G. Jackson at the Society of Arts, a report of which will be found on page 661, was of much more value than the discussion which followed it; but the paper and the discussion together suggest one or two points for special consideration.

The often-vexed question of grouping and symmetrical design in street architecture, as against the effect of individuality, or independent treatment for each property, naturally comes up once more; and we are glad to find that Mr. Jackson recognises the importance of symmetrical architectural treatment, if he does not advocate it in all cases, and he commented strongly on the manner in which the design of Regent-street, "the one fine and consistent piece of street architecture in London," has been practically destroyed by the intrusive alterations which have been permitted to be made in it. To call Regent-street, in its original state, "fine" architecture is what we should hesitate to do *sans phrase*, but "consistent" at all events it was, and has now ceased to be so, and people are beginning to find, when it is too late, that they have destroyed something which was of architectural value to London. Regent-street would have been respected had it existed in Paris. An owner of one or two houses in the Place Vendôme wished some little time ago to raise them, thereby spoiling the architectural design of the square; he was not allowed to do so.

Our own opinion is that massing of street architecture, if not for a whole street, at all events in large blocks, in a symmetrical design, is an almost necessary expedient if the highest dignity is to be given to the architecture of a city. It is owing to the prevalence of this symmetrical street architecture that Paris has that grandiose air which makes it seem a city so much more, in the full sense of the word, than our own capital. Of course it may be said that the Paris street architecture is somewhat cold and formal and wanting in variety; so it is, but something must be given up either for the picturesque on one side or the stately on another; and to our mind it is the stately element that is most proper to a capital city, at all events. The manner in which the County Council have let slip the opportunity for stately and symmetrical design in Aldwych and Kingsway, after laying the foundation for it by instituting a competition for designs, is absolutely lamentable. The mischief is done now in Aldwych, but there is still some place for repentance in regard to Kingsway.

The demand for special treatment and special material for shop front architecture was rather more emphasised by Mr. Jackson than we should have expected. He urged that was no reason why stanchions and bresssummers should not be treated architecturally if there was an absolute demand for entirely glazed shop fronts; and this was naturally echoed by an eminent engineer present, who said that if architects were to meet the commercial requirements of the present day they must forget a great deal about Greek and Roman and Gothic architecture, which "was not suitable for modern commercial life"; and he

defended iron construction by the examples of Southwark and Blackfriars bridges, which he appears to group together; whereas in fact Southwark is a fine and sober piece of actual construction, and the Blackfriars' spans are a piece of pretentious vulgarity. So much for engineering criticism of the aesthetic. We have heard all this of course, very often, but without being convinced. We do not think that steel bresssummers and stanchions are capable of as much architectural effect as stone piers and arches, though we quite agree that if that glass ground-story is indispensable, the means of supporting the building above it should be openly shown, and treated in a way characteristic of the material; and it is too true that this is very seldom done at present, and we see arches or imaginary stone lintels, that could not possibly stand put up in order to comply with what are supposed to be the demands of architecture. That of course is all wrong; and visible steel structure is much better than sham stone structure. But after all, real stone structure is better than either; and whatever the "honesty" of the steel construction, we have still the disagreeable effect of the empty space as the base of an architectural design. But the question is, whether people are not getting hold of the whole matter the wrong way about. Is it really necessary to the prosperity of a shopkeeper that he should have the whole front of his shop scooped out and filled with plate glass? Is it not merely a superstition of the tracing mind? And is it not possible to convert the shopkeeper to a perception that a dignified architectural masonry front, even if arched, is worth more to his trade than filling up the spandrels with glass?

THE CARE OF ANCIENT MONUMENTS.

(Concluded.)

BY PROFESSOR BALDWIN BROWN.

WE now come to the question of formal Monument Acts passed by State Legislatures for the preservation of national treasures in the form of historical and artistic monuments. A list with dates of the principal European Acts of the kind was given in the first paper (*ante*, p. 594). There is no space to attempt a notice of them all, but it may be said generally that they differ according to the objects specially aimed at in the legislation. Thus, movable works of art are sometimes specially considered, and the aim is to prevent these being sold out of the country to the foreigner. This aim is prominent in Italian monument legislation, and the recent Act of 1902 of Canton Bern, in Switzerland, mentions in the preamble the too-frequent sale of works of art to the foreigner as one reason for legislation. Some countries, again, have to provide specially for the care of excavations and for the disposal of objects which these may bring to light. The Monument Act of 1881 for the kingdom of Hungary lays stress on these points. Other Acts again contemplate chiefly immovable objects, and are framed with a view to the preservation from injury of a certain special class of architectural and other monuments of outstanding importance that are entered in a schedule. This is the character of the British Ancient Monument Act of 1882 and of the fuller law passed in France in 1887. The most comprehensive of the recent measures is the one passed in the Grand Duchy of Hesse in 1902, but it is possible that when the projects for monument legislation now under consideration in Prussia, Austria, and Bavaria pass into law we shall have something still more complete and satisfactory. It is understood that the forthcoming Prussian Act will contain a provision for arming urban authorities with legal powers to give effect to aesthetic requirements.

A comparison of Monument Acts, however, and of drafts for such Acts, shows that in the more advanced countries of to-day it is not easy to carry through the legislature any very stringent provisions for the protection of monuments. Very many of these are in private ownership, and in advanced communities respect for the rights of private property is often elevated into a sort of fetish. Again, in such communities questions of public health and of convenience in the means of intercourse are of great importance, and in any conflict of interests that may arise between the new and the old, the ancient monument is too often sacrificed. Sir John Lubbock, now Lord Avebury, had to battle for ten years before he could pass the Act of 1882, mild as it is, because Parliamentary opponents cried out that the rights of private property were being invaded. Most modern Acts were more drastic in draft than in their final form, and the claims of the public interest in what are after all national possessions have had to be compromised in face of the opposition of the private lords of the soil. For downright uncompromising

prohibitions we have to go to the Monument Acts of countries like Turkey, or some of the Danubian kingdoms. The French Act of 1887 has provisions framed especially for Algeria, and these are more severe than those applicable to the mother country. The French protectorate of Tunis has a Monument Act far more searching than the French people would have accepted for themselves.

It will be convenient to notice first of all this French law on historical monuments, which may be taken as sufficiently typical of other similar measures. It is not the most recent, nor the most comprehensive, nor most drastic, of European Acts of the kind, nor is it by any means faultless in content or expression, but it enjoys the prestige attaching to all the institutions connected with art in its favoured country.

The French law, like other such Acts, makes a distinction between monuments belonging to the State, or to public bodies over which the State has some control, and those in the hands of private corporations or individuals. A list has been drawn up by the Commission on Historical Monuments, in which an endeavour is made to schedule all those objects of historical or artistic interest that are held to be of national importance. The number of monuments actually thus scheduled, or, as the French say, "*classés*," is about 2,200, and of these about 308 are prehistoric monuments, such as dolmens or standing stones. The effect of this insertion in the schedule is that, in the words of the fourth article of the Act, "the monument that has been 'classified' cannot be destroyed even in part nor become the object of a work of restoration or repair, nor of any sort of alteration, unless the Minister of Public Instruction and of the Fine Arts has given his consent." It will be seen by this that complete protection is secured in the Act for the scheduled monuments, but it does not follow that this schedule includes everything in the country that is specially worth preserving. It is a provision of the Act that no monument can be "classified" without the consent of the body or individual that owns it. When the owner is a Government department or a public body, pressure can be brought to bear on it by the Council of State, so that consent to enrollment can practically always be obtained. In the case of the recalcitrant private proprietor, who will not allow a monument to be "classified," it is possible to proceed by the process of compulsory purchase or expropriation. This process had all along been available, for the general law in France allows of expropriation on grounds of public utility, and it had been officially recognised that considerations of art and of historic interest come under this head. Even before the passing of this Act of 1887 the weapon of compulsory purchase had been effectively used in favour of historic monuments, so the Act introduced in this matter no new principle, but only emphasised already existing provisions.

The main result of the French Monument Act, accordingly, is that it gives practical security to all monuments that belong to public bodies, while to those in private hands it opens the

way to safety though through a course of procedure that is somewhat cumbersome as well as expensive. It is something, however, gained to a country when legislation has definitely ensured to it a method by which any national possession that may be actually upon private land can be, if that country choose, preserved to all future generations: In this island there is no such method, for the Government can only purchase monuments by agreement with the owner, and, in view of the portentous "dourness" exhibited (though not in connexion with monuments) by some British property-owners, one trembles to think what might happen to some monument of world wide value were war declared between a private proprietor and the public at large.

The two most important Monument Acts of more recent date than that of France are those passed in 1902 by the legislatures of Italy and of the Grand Duchy of Hesse. The main result of each of these Acts, so far as architectural monuments are concerned, is similar to that of the French Act. The Italian law, like Italian monument-legislation in general, devotes a good deal of attention to movable objects of artistic worth, the exportation of which from the country has always been a vexed question in the peninsula, and deals also in some detail with the State regulation of excavations and "finds." The Hessian law, over and above the main provisions, has some of a novel character that represent an advance in monument legislation. Conspicuous among these is the clause empowering the State to delegate to local bodies the right of expropriation in the interests of monuments which belongs to it. Other provisions of the kind relate to the protection of natural sites, the control of the advertisement-field, etc. It will be well to analyse this Act somewhat at length as one of the last official utterances on monument administration.

The Hessian law is rendered all the more instructive by the fact that the author of it, Freiherr von Biegeleben, gave a full account of it to the German Monument Congresses of 1901 and 1902, and explained the difficulties which had to be encountered and the changes which the draft underwent in its passage through the Legislature. He has also reported more recently on its satisfactory working to the Congress held at Mainz in September, 1904.

The Act, which came into force on October 1, 1902, falls into seven sections and contains thirty-nine articles; each of the main and subsidiary divisions has a useful heading. The first section, articles 1 to 8, is concerned with monuments in the possession of corporations and public bodies, and the expression "monuments" includes movable objects as well as architectural structures, and takes in documents as well as works of art. These bodies are forbidden not only to destroy or alienate any monument in their possession, but to effect on it any alterations or restorations without previously obtaining the permission of the authorities, such permission being given or withheld upon considerations of an artistic or historical kind. Alterations in the adjuncts or surroundings of a monument are included

in this provision. The authorities in question are the "Kreisamt," perhaps roughly corresponding to our County Councils, and there are appeals to higher bodies up to the Minister of the Interior. On the "Kreisamt" is enjoined the duty of drawing up an inventory of all monuments belonging to public bodies within its district.

The second section, articles 9 to 17, is concerned with monuments in the possession of private persons. Movable objects in such ownership are excluded from the operation of the Act, and with regard to other (architectural) monuments, only those are protected which are included in an official list. The task of drawing up this list or schedule (which is quite distinct from the mere inventory kept by the "Kreisamt") is in the hands of a Council on Monuments ("Denkmalrath"), the constitution of which is defined in article 32 of the Act. It is called together by the Minister of the Interior, and consists of representatives of the Catholic and Protestant churches, at least two members of the Hessian antiquarian, historical, or artistic societies, and two resident Hessian owners of architectural monuments. A private proprietor of a monument must be informed when it is in this way scheduled, and is allowed to appeal against the inclusion to the Minister of the Interior. Any proposed alienation, alteration, or restoration of a scheduled monument in private hands must be reported to the "Denkmalpfleger," that is, the general Conservator of monuments for the State at large, and, unless the proprietor receives official sanction, he is bound to take no steps involving a carrying-out of the proposal till six weeks have elapsed. During that interval, if the proposal seem to involve danger to the monument, the Conservator has to exercise what moral pressure he can on the proprietor to induce him to modify his intentions, and, to give time for this, the Minister of the Interior may prolong the period of six weeks to one of three months. In case of a proposal on the part of the proprietor to destroy the monument or to alter injuriously its surroundings, permission must be asked either from the "Kreisamt" or from the "Denkmalpfleger." If permission be refused, the proprietor may appeal to the Minister of the Interior within a period of four weeks, to which no extension can be allowed. If the answer to the request for permission be not sent within a space of six weeks (which the Minister can extend to three months), then the proprietor is allowed to carry out his original proposal. In case the permission be refused or only granted partially, and the appeal to the Minister of the Interior be rejected, then the proprietor can within six weeks claim compensation from the Minister for the curtailment of his rights of disposal over his property, or can call upon the State to acquire the monument or its surroundings at a valuation.

Section three, articles 18 to 24, deals with special cases. Article 19, entitled "Right of Expropriation in the Interest of Monuments," is of enough importance to be quoted in full.

"The State is authorised to limit the

rights of private property in laud to such an extent as is needful:—

- "(1) To secure the preservation of an architectural monument, the maintenance or security of which is being neglected in such a manner as to endanger its existence or the upkeep of essential parts of it; or
- "(2) To effect such an opening out of a monument as is demanded by artistic or historical considerations, provided that no overpowering public or private interest come in the way.

"The proprietor, in so far as circumstances make this reasonable, may demand, in place of the limitation of his rights, their entire acquisition by the State.

"The State is empowered, by a rescript of the Minister of the Interior, to transfer the right of expropriation given to it in the first paragraph of this article to the commune, the district, or the province, in which the architectural monument is situated." (This last provision has been already referred to as a novel and important one.)

Other articles of this section secure to the State the right of visitation and of making plans and drawings of monuments, and the right of ordering a proper expenditure on monuments on the part of public bodies that own them.

Article 23 provides that any projected road or railway line that threatens the existence or amenity of a monument shall not be made without leave of the Minister of the Interior. Also that, in the interest of the amenity of an architectural monument, local regulations may be made to prevent new buildings being erected within a certain distance of it, or the buildings in its vicinity being raised above a certain height.

The fourth section, articles 25 to 30, is concerned with the question of excavations and "finds." The former cannot be undertaken without previous notice to the authorities; the latter must immediately be announced to the burgomaster or "Kreisamt" of the locality.

Land may be expropriated for the purpose of carrying on excavations.

The fifth section, articles 31 and 32, deals with the organisation of the bureau for the care of monuments, etc.

Section six, articles 33 to 36, introduces us to a new and interesting feature in Monument Acts, the care of "Naturdenkmäler," or natural scenes and objects. Article 33 begins as follows:—

"Natural phenomena of the earth's surface, such as watercourses, rocks, trees, and the like, the maintenance of which is a matter of public interest on grounds of history or of natural history, or from considerations of the beauty or special character of a landscape (natural monuments) can be placed under a special protection to be exercised by the 'Kreisamt' on the demand of the Department of Forests, etc., in the Ministry of Finance.

"This protection can be extended to the surroundings of a natural monument."

The owner, be it a public body or a private person, is to be informed that the natural monument is scheduled, and can appeal, as in the case of the monuments referred to in previous sections.

Article 34 continues:—

"Operations which threaten the continued existence of a natural monument that is officially protected, or promise to injure either this or its officially protected environment, can only be carried out after the permission of the 'Kreisamt' has previously been obtained.

"Such permission is to be refused when the proposed operations give rise to apprehensions in respect to the maintenance of the monument, or to considerations of the kind referred to in article 33, and when such apprehensions outweigh the public or private interests that may be injuriously affected by the refusal."

Article 35 will appeal to the sorely-tried British lover of amenity and quiet.

"Prohibition of Advertisements, Posters, etc.

"On a natural monument-officially protected, or in its officially protected environment, no advertisements, nor the like, nor objects such as posters shall be placed or set up of such a kind as to injure the effect of the monument.

"At the bidding of the 'Kreisamt,' advertisements, or objects of the kind referred to, which at the time of the promulgation of this Act are already in existence, must be removed. The proprietor can demand from the State an indemnification for the loss sustained by him through the removal of what he had put up.

"It shall be competent for district authorities, through local police regulations, to forbid the importation or display of advertisements, etc., or of objects which in localities of great natural beauty are injurious to the landscape; and, further, to direct the removal of those already in existence at the localities in question."

In the seventh and last section, articles 37 to 39, there are provisions for penalties for breach of the Act. These are fines up to 50*l.* or imprisonment.

The provisions of our own Ancient Monument Act of 1882 are probably sufficiently well known to make any analysis unnecessary. It was based upon a schedule embracing sixty-nine monuments, all but seven of which were of the prehistoric class, to which seventeen or eighteen others have since been added. Under the Act, the Commissioners of Works, who have the administration of it, can punish anyone but the owner who injures or defaces any scheduled monument. An owner may, if he choose, constitute the Commissioners guardians of any ancient monument in his possession, and in that case he is no longer able to work his own will upon it. By arrangement, the Commissioners may become the owners of the monument, but there is no power from their side of compulsory purchase. The Commissioners are now guardians of about forty monuments, but they have never actually purchased any. Very little money has been laid out by them on the monuments in their guardianship.

In Ireland, ancient monuments are much better off, and the danger here is that they may receive only too much attention at the hands of well-meaning "restorers." When the Irish Church Act was passed in 1869 there was a clause added by which ruined or disused places

of worship that had a historical or artistic interest were handed over to the care of the Irish Commissioners of Works, and a sum of money amounting to 50,000*l.* was set apart for their maintenance. Furthermore, in 1892, a special Monument Act was passed for Ireland enabling the Commissioners to apply the Act of 1882 to other structures of interest, besides those of the prehistoric or sculptured-stone classes to which its operations were at first confined. The result has been that the Irish Commissioners of Works now rejoice in the guardianship of no fewer than 189 ancient and national monuments, and spend upon them the handsome sum of about 1,000*l.* a year.

In the year 1900 a very distinct advance was made in the official care of monuments in Great Britain. By a short amendment-Act, the functions with regard to monuments previously in the sole hands of the Commissioners of Works were extended to County Councils, who were empowered to purchase by agreement or become the guardians of any monument possessed of historic, traditional, or artistic interest. This provision is of the best promise for the future, as introducing the decentralising process in monument administration, which has been adopted with good effect both in Italy and Germany. There is another clause to the effect that Commissioners of Works or County Councils may receive voluntary contributions towards the upkeep of any monument under their charge, and enter into an agreement with an owner or "any other person" as to its "maintenance and preservation, and the cost thereof." This, again, is a most promising stipulation, as it brings official authorities into touch with private societies, such as the "National Trust," as well as with individuals who may take special personal or local interest in some monument or group. This common action of the official and the private agencies is of the utmost importance for a healthy "Care of Ancient Monuments" such as we may hope to see established in our own country in the near future.

NOTES.

The Venice Campanile. ACCORDING to a recent report, work is proceeding slowly and carefully on the foundation for the new Campanile at Venice. The authorities have wisely decided to leave the old foundation undisturbed but to surround it by a belt of concrete supported on piles. This belt will be 15 ft. wide, and the necessary excavation has already been completed. The trench is lined with sheet piling, and 8 in. square piles are now being driven close together in the bottom. The progress of every pile is carefully watched, and driving is stopped immediately a satisfactory bearing is obtained. We understand that a grillage will be formed over the heads of the piles so as to provide for uniform distribution of the load. Examination of the old foundation revealed the fact that the centre portion had been filled in with loose stones, about 6 in. or 7 in. square. Thus, the original footings formed a hollow square, transmitting the load due to the superstructure directly to the

supporting piles. The present condition of the foundation testifies to the correct judgment of its designers, as the collapse of the tower demonstrates the danger of tampering with ancient masonry structures after the manner followed at Venice in the XVIIth and XVIIIth centuries.

London Fogs. CONSIDERING its position and meteorological conditions, it is morally certain that

London must always be subject to fogs, even if coal fires were entirely abolished. The substitution of purified gas for coal as a source of heat would certainly reduce the blackness, density, and irritant effect of fogs, and the universal adoption of electricity as a source of light and heat would be still more beneficial, but could not obviate the formation of white fogs—cold, damp, and laden with carbonic acid gas and other objectionable vapours. As remedial measures on a comprehensive scale are out of the question, Londoners must be resigned to their fate, and the most practical course of action at the present time is to inquire more fully into the possibility of forecasting fogs for the guidance of electric lighting authorities, railway companies, and the travelling public. Some useful work in this direction has already been done by the Meteorological Council, whose recent Report is an interesting and instructive document. So far, however, it appears unlikely that it will be possible to derive a warning for one district of the metropolis from the observation of actual fogs in other districts, although the hope is held out that such warnings may be afforded by special readings of thermometers and barometric instruments. Further investigation is still necessary, but the conduct of this involves expenditure, which the Meteorological Council cannot undertake with the limited means placed at its disposal.

The Law of Light. THE important case of *Kine v. Jolly*, which was the subject of an article in our

issue of September 3, has been carried to the Court of Appeal. It will be remembered that the action was brought in respect of obstruction of light to three rooms, that the judge decided there was such an obstruction to the light of the morning-room as to amount to nuisance in that the room had lost its characteristic cheerfulness, and that this, taken in conjunction with the loss of light to the hall, entitled the plaintiff to a mandatory injunction. We discussed the case fully in our former article, and we commented on the fact that the learned judge had granted an injunction since it appeared to be a case in which, according to the *dicta* of the House of Lords in *Colls v. Home and Colonial Stores*, the remedy should have been damages. The Court of Appeal have now varied the judgment of the Court below to this effect. It is, however, noteworthy that, while the majority of the Court upheld the finding of Mr. Justice Kekewich that there was a sensible interference with the comfort and convenience of the house as a dwelling house amounting to nuisance, Lord Justice Romer dissented and failed to see any nuisance since the finding of fact was that the morning-room remained a well-lighted room. This case, therefore,

leaves the question of what is the test to be applied in such cases as to the existence of nuisance still undetermined.

The New York Rapid Transit Subway. ALTHOUGH the new underground railway of New York

has only been opened for a few weeks, considerable complaint is made as to the unpleasant character of the air. Americans are not generally prone to criticise their national works in any adverse spirit, and in the technical press there appears to be an effort to explain away the close and disagreeable condition of the atmosphere in the new subway. We are told that ferry boats across the East River are more offensive, that Pullman trains are as stuffy, and that so long as unwashed people travel in closed cars the air will not be agreeable to persons of delicate sensibilities. Comments of this kind are simply evasions of the main question. Further, we are informed that there are so many large openings into the subway and so many trains to act as pistons in moving the air that it will be difficult to convince any engineer that the air is really so bad as to render special ventilation necessary. This is just the same sort of argument that was used in London after the opening of the City and South London and the Central London railways, but in point of fact the air grew steadily worse in each of these tubular lines. Our American friends will have to face the position and profit by experience on this side of the Atlantic. In this connexion we may say that atmospheric tests are already being made by Professor Chandler, and it is said by one hopeful writer that so far as they have gone the tests indicate "the air of the subway to be entirely satisfactory." We shall be interested to notice what they show after completion, and if the results prove quite satisfactory we shall be pleasantly surprised.

Union Bridge, Aberdeen. WE hear that it is being found necessary to widen

Union Bridge, Aberdeen, which was built in the first years of last century to connect the old town and the new across the deep depression or valley called Denburn, and give access to Union-street. The bridge is a fine work in the dignified and severe classic style in which new Aberdeen was mostly carried out. Both Rennie and Telford were consulted about it and made designs, and the actual design is probably Telford's, from the documentary evidence, though the appearance and treatment of the arch remind one strongly of Rennie's work at London Bridge. A local history which has been published claims it for a local man, Fletcher by name; but this is very doubtful, as it is known that Fletcher proposed a balustrade of Gothic arches, while every detail in the bridge as carried out is the severest classic. It is odd that the width of the bridge, at first intended to be 50 ft., was reduced to 40 ft., not only for economy, but because "it would tend much to beautify it." Had the first intended width been retained, it would probably not now be necessary to widen it. We hope nothing will be done to interfere in any way with its original severe and monumental character.

Test of a Large Concrete-Steel Beam. A CONCRETE-STEEL beam, having the unusually long span of 55 ft. between supports, forms the chief support of the gallery in the New Lyric Theatre in Cleveland, U.S.A. This beam has a T-section, the upper flange measuring 20 in. wide by 10 in. deep, and the vertical leg 12 in. wide by 50 in. deep, the total depth of the beam being 60 in. The concrete used was mixed in the proportions of 1 part Portland cement, 2 parts river sand, and 4 parts silica gravel, and the reinforcement consists of seventeen longitudinal round bars in the tension and compression areas, in addition to stiffening bars for resisting any tendency to buckling, and 400 stirrups of different sizes for resisting shearing stresses. An interesting feature is that the beam is separately supported on concrete-steel columns, and thus no part of its weight comes upon the rest of the building. Owing to the small area presented by the upper surface of the beam and the great weight necessary for testing it was decided to adopt the novel device of applying the test load by hanging a platform from a limited portion of the beam on either side of the central point. The platform was laden with pig-iron up to the maximum load of 44 tons. No deflection was observed on the application of the first 4 tons, but beyond this load deflection commenced and increased at the rate of about $\frac{1}{8}$ in. per ton of load, the total deflection for the maximum test load being $\frac{1}{4}$ in. It is satisfactory to note that close examination revealed no evidence of cracks in the concrete, and the architects are to be congratulated upon the success attending this bold example of construction.

Dust Destroyers and Electric Lighting. THE paper recently read by Mr. W. P. Adams to the Institution of Electrical Engineers is of general interest, as well as being of great value to electricians. He discusses in a very able manner the question of the combination of dust destructors with electricity works. In a lecture to the Society of Arts, given twelve years ago, Professor G. Forhes stated that if all the refuse then collected in Paddington were properly burnt and used in the most economical way, it would provide enough electricity to light one 8-candle power lamp for two hours every night of the year for each of the inhabitants. We learn from this paper that the results obtained at Hackney and Fulham practically do this already, and in a few years even better results will be obtained. Mr. Adams calculates that approximately one million tons of refuse are collected every year in London, most of which is taken out to sea by barges at considerable expense to the ratepayer. On a moderate estimate, the value of the potential capacity of this refuse for steam raising for electric engines is 100,000,000 per annum. We think the author has proved that, with the improved dust destructors now in use, there is a substantial gain, in most cases, in combining dust destructor and electricity works. The exceptional cases are when the refuse has a very low calorific value. At Llandudno and at Royton in Lancashire, for example,

the refuse is of little use for steam raising. It is curious to note that the dust of great calorific value comes from poor neighbourhoods. At Bermondsey its value is particularly high. Mr. Adams suggests that the explanation is that the working classes, unlike the middle classes, rarely sift their ashes. In considering the question of dust destructors, the first point to be settled by municipalities, therefore, is the heating value of the refuse collected. This can be determined experimentally without much difficulty, and the value remains wonderfully constant in a given neighbourhood. The revenue earned by a dust destructor is due mainly to the supply of steam to the electricity works, but this steam can be sold for many other purposes as well.

Portland Cement. IN a paper recently read before the Civil and Mechanical Engineers' Society, Mr. H. E. Bellamy presented a useful series of notes upon Portland cement, embodying therein some of the experience gained during the execution of works in Queensland, which necessitated the use of several thousands of casks of cement. There is a strong family resemblance among all papers and articles dealing with the material in question, and the chief claim of the communication to which we now refer appears to be that it sets forth the views and conclusions of an engineer who, in the capacity of a purchaser and user, has been obliged to examine and compare numerous descriptions of cement made in England, America, Germany, and in Australia. A point of some importance to British cement manufacturers is that surprising quantities of foreign cements find their way into the Colonies, owing to their high tensile resistance and rapidity of setting. While pointing out the objection to abnormally high tensile results, the author speaks in terms of approval with regard to cement having the property of setting quickly. We feel certain that the best English cements are unsurpassed by any of foreign make, and that the results they give in testing are notably uniform and constant; but if users in the Colonies desire a product having certain distinctive characteristics, it is clearly worth while for our manufacturers to comply with these. If they do not, foreigners will continue to obtain undue advantage in purely British markets.

Sheffield Sewage Works. AN inquiry was held at Sheffield last week by Mr. A. A. G. Malet and Dr. Theodore Thomson, on behalf of the Local Government Board, the purport of the inquiry being the city's proposal to borrow 300,000, for new works of sewerage and sewage disposal. Nearly the whole of the money is required for the sewage disposal works. The evidence showed that the existing works were completed as recently as 1887 at a cost (including intercepting sewers) of nearly 200,000, and the Town Clerk (Mr. Sayer) had evidently determined that the two Commissioners should not fail to learn the part played by the Local Government Board in the preparation of the scheme of precipitation by lime which

was then adopted and which has since been condemned by the Board. "The Local Government Board," he said, "approved the plans for the precipitation works in every respect and made various suggestions in regard to them," and also "referred several municipalities, including Glasgow and Manchester, to the Sheffield works as an example of the best method of dealing with sewage." It would seem unkind of the Town Clerk to hint that the Local Government Board is not infallible, but the hint is evidently designed to prevent (if that be possible) the new Commissioners from repeating the mistake of suggesting any improvement in a scheme recommended by the city of Sheffield. That there is, or was, a possibility of the hint being disregarded is shown by the Commissioners' evident reluctance to accept the opinions of the witnesses that single contact-bed treatment, after preliminary sedimentation and settlement, would produce a satisfactory effluent. It is, at any rate, a sign of the times that a city with a population of over 400,000 and a great variety of industries should ask the Local Government Board to sanction a scheme of bacterial treatment pure and simple.

Architects' Drawings. We hope all who are practically interested in this question will read the spirited letter of "A Provincial Architect" published under the head of "Correspondence" in this issue. Although all architects appear to be agreed on the principle of the matter, a good many seem to be very much wanting in spirit and determination in resisting the claims made. Mr. Hayward's and Mr. Hubbard's letters also may be studied with advantage. If architects and architectural representative societies stand by each other and show a firm front, something will probably be done to amend the law or its application; but nothing will be accomplished by a half-hearted policy.

BROMLEY MUNICIPAL BUILDINGS COMPETITION.

THE Borough of Bromley, in Kent, having reached a stage when it is necessary to extend its municipal offices, has secured land for the erection of various administrative departments, and the new Council Offices and Court House, for which competitive designs were on view on December 19, will form the nucleus of the general scheme. We were favoured with an opportunity of inspecting the forty-three sets of drawings (crowded together in badly-lighted rooms), amongst which much excellent work is to be seen.

Mr. J. S. Gibson, F.R.I.B.A., was the assessor, with whose selection of first place we are in agreement; we cannot say, however, that we approve of the choice of the four premiated designs.

The accommodation asked for is that usual for municipal offices, with the addition of a large education department and county court with accessory rooms. The site is an open one fronting three streets, and the cost of the buildings is limited to 20,000.

Mr. R. F. Atkinson, of London, is awarded first place for what is a simple, straightforward plan, in which the buildings front the three roads, leaving a clear space in the middle of the site. The design of the main elevation, in brick and stone, is very suited to the suburban character of the borough; no perspective is submitted. The matter of future extension is well considered. The principal entrance and staircase occupy the central position on the main facade, leading up to the council chamber on the first floor, which overlooks the interior of the site. Corridors and entrances

are well arranged. In criticising the design, we should say that certain improvements can be effected with slight alteration. We do not like the rates office being approached from the main entrance hall, as there is always considerable traffic in this department. Most of the officials' private rooms have fireplaces, but the overseer, rate collector, and borough accountant surely deserve equal consideration? The staff lavatories are placed at the south extremity of the offices, which is anything but convenient and entails great loss of time. The councillors' conveniences, on the first floor, are quite separated from the robing-rooms, involving the traversing of the main corridor. Two doors into the council chamber would be found better than one, and the public gallery, which occupies a lateral position, would become a mere passage when the future extension, indicated by the author, is made. This gallery will be very useful for ventilating the chamber! The caretaker's apartments, although of no great importance, need careful revision; the ill-lighted corridor, the absence of coal-place, the south light to the larder, and the top-lighted bedroom are points which suggest hurried planning. These, however, are not insuperable blemishes in a scheme of which the merits are simplicity of plan and moderation in cost.

Messrs. H. Ashley & Winton Newman, placed second, send a design, illustrated by a well-drawn perspective, in which a good stone central part, crowned by the lead dome of the council chamber, takes a very satisfactory place with the brick and stone wings; the latter, however, are feeble. The plan is on the lines of the successful design, but the public gallery staircase and staff lavatories are in much better positions.

The design awarded third place, by Mr. G. H. Norton, is L-shaped in plan, having the head to the main road, and a central corridor throughout the body of the figure. This corridor is wholly top-lighted. The future extension, as indicated, would ruin the lighting of the offices already built. Placing the caretaker in the basement at such an open site as most unhappy. The four doors in the council chamber would constitute an annoyance to its occupants. Although the main front has dignity, there is much wasteful planning in the offices and vaulted corridors.

Messrs. Hall & Phillips are awarded fourth place for a plan which shows a completed scheme; if built to suit initial requirements, however, the elevations would have very irregular forms. A wide mass of buildings is contrived with two large internal areas, and the council chamber and county court have internal situations. This is a wise provision in a noisy town, but hardly necessary at Bromley; moreover, it involves wasteful entrances and corridors for officials, public, and prisoners. The abruptness of the central stone features of the main front is unsatisfactory, and the authors wisely submit only a part-perspective.

The fifth premiated design, by Messrs. Lanchester & Rickards, has a very compact plan with the various departments arranged in a square, thus forming a large internal area. This compression forces the sanitary inspector's private and public offices into a basement lighted from an external area and approached by a small staircase. The council chamber is placed above the main entrance and appears to be too large for its purpose. The Mayor's seat is in a kind of bay-window, which is carried down to the ground-floor, forming the chief projection of the front. The external appearance is of a heavily-moulded nature devoid of any dignified proportion and commonplace in its use of features. The lighting of the entrance hall is not satisfactory. The police-court is square in shape, with the bench placed in a large recess; the plans do not indicate an outside entrance for magistrates or for prisoners. This scheme does not lend itself for convenient future extension.

Of the remaining designs the following are some of the more successful, the names of the authors not being disclosed. A good pencil perspective view illustrates design No. 42, which in grouping somewhat resembles the accepted scheme, and is an excellent brick and stone building. The lighting of the council chamber, the limited provision for doors, and the many top-lighted rooms next the county court are not good points.

No. 32 follows the general arrangement, except that the education department is placed on the south boundary with the corridor next

the town hall site, so that it may be used when that building is erected; but the plan errs in the extent of its corridor space. The ground floor accommodation for the caretaker, who will be enabled to study the backs of the office buildings, and have full enjoyment of the main entrance on Sundays, is poor. By scheming important offices on both sides of an unlighted corridor No. 43 destroys all chance of success in a building of this order. There is no object in closing up the same corridor on the first floor with doors, but this is only one of other impossible ideas which a respectable elevation does not warrant.

No. 41 is a simple and, in many ways, an admirable plan; but the council chamber has too much outside wall, and the attempt to reconcile its external expression with that of the town clerk's rooms is one of its defects. No. 14 has a large mass of building necessitating two long top-lighted corridors—an arrangement suited to a scheme double the size in a large town.

A design deserving a premiated place is No. 24, which is illustrated by charming drawings. The plan is symmetrical, having two large internal areas, while future extension is intended to be placed above the two side wings. Here lies the cause of the wasteful nature of the initial form of the buildings, but the general idea is excellent. It is pleasing to find an over-hanging eaves, as shown in No. 36, in place of the usual cornice or parapet; this elevation, however, would be all the better for a heavier centre in place of the twin hips lying behind a small pedimented stone feature. The plan is poor; the idea of compelling councillors to enter and escape from their lavatories direct from the council chamber is very bad.

The chief defects in an excellent scheme numbered 35 are the change of level between the mayor's and councillors' robing-rooms and the council chamber; the necessity of the caretaker and his family to use the grand staircase from the first floor level downwards and to keep the perambulator in the main entrance. In spite of these blemishes the design deserved a better fate.

No. 18 is perhaps the best elevation in the competition; the plan is economical, in that the council chamber is placed above the county court. The oblong form and single entrance to the chamber, the distance of mayor's and robing-rooms, and the prominence given to the education store are the only weak points in a beautifully-drawn design, which should, without question, receive a premium.

A departure from custom in works of this nature is seen in No. 13, where two staircases, each in straight flights, are proposed; it does not suggest the dignity which was asked for. No. 5 errs in this respect, for his main entrance and stairs are much too cramped.

No. 26 achieves dignity in a popular manner by placing a high-pitched roof and *flèche* above the council chamber, and leads up to the height in the composition with two circular turrets on the building line, each of which contains a public gallery staircase. The plan is practical and easy working, but the placing of the education offices upon the south boundary overlooking the future town hall, combined with excess of cost, has prejudiced the author's chances of success.

No. 38 is surprising in that a main angle entrance is contrived, from which a clever and unnecessary form of plan is evolved. The ball and stairs are too extensive and lead up to nothing. The dual use of the circular stairs to serve the galleries of the court and council chamber is adroit. The elevations are "fresh," leaning more to a domestic manner, to the exclusion of regulation competition features.

A large clock tower—the only one in the whole series—meets the eye in No. 10, and terminates an angle in the building front, whilst the council chamber, with main entrance, finishes the corresponding corner. It would have been better to have reserved the tower for the future town hall.

Throughout the competition a combination of three pediments—two of which are segmental—is largely introduced. Nos. 29, 28, and 8 are prominent in this respect. No. 4 has an excellent elevation, but the enormous expanse of lead flats quite prohibits serious consideration.

No. 9 has a closed-in building so far as the ground floor is concerned, with abundant top-lighted corridor. The main elevation, which is perhaps the shortest submitted, has a delightful brick and stone treatment, with stone mullioned windows, steep roof, and ridge balustrade. No. 7 is overloaded with heavy

pedimented projections where a greater use of an uninterrupted wall would have had more force; the planning is very good in all general respects, but there are six staircases leading to too many independent basements. No. 17 is the only competitor who provides large sheets of glass in the windows, and the design suffers in consequence.

ENGINEERING FEATURES OF THE LONDON COLISEUM.

Quite apart from architectural considerations, the engineering features of the London Coliseum possesses much interest. Every effort has been made to secure the safety of the public by the adoption of fire-resisting construction for the walls, floors, and other main parts of the building. Nearly all the interior woodwork is of oak, and where pine and deal are used they have been rendered non-flammable by chemical treatment. Hydrants, alarm bells, and other fire appliances are liberally provided, and further assistance in case of any local outbreak of fire will be given by the complete telephone installation, which affords means of communication between all parts of the stage and the auditorium. Owing to the favourable situation of the building it has been possible to provide so many exit doors that the house can be cleared without difficulty in about three minutes. The stage is fitted with a fire-resisting curtain of asbestos and steel, and this curtain, 55 ft. in width, is raised and lowered by hydraulic machinery.

In the auditorium the Plenum system of heating and ventilation has been adopted, the installation being very similar to that applied by the architect at the Hippodrome, and on the stage heating is effected by direct radiation. The whole of the interior is lighted by incandescent electric lamps, but a few arc lamps are employed for special scenic and other effects.

A unique feature is to be found in the provision of lifts to convey the audience to the upper floors. Two electric lifts, each capable of accommodating eleven persons, communicate with the smoking lounge in the basement, the grand saloon, the foyers on the first and second floors, and the roof garden above. Although the extreme convenience of lift accommodation has been for many years demonstrated at the Albert Hall, it is a singular thing that no theatres in this country have previously been fitted with lifts, and we believe the same applies to Continental theatres. Another novel device, upon which the architect is to be congratulated, is the movable lounge by which visitors will be conveyed from the Royal entrance of the building to the Royal box. When the entrance doors have been thrown open the visitors will step directly into what appears to be a handsomely furnished apartment of the building, but really is a large car moving upon a track formed in the floor, through the saloon and into a foyer containing the entrance to the Royal box. The car, remaining in position at this entrance, will serve as an ante-room during the performance. A door opposite to that through which the visitors enter from the street gives access to the Royal box, and the first-mentioned door communicates with the foyer, from which the public will be excluded when Royal visitors are present.

But the most remarkable engineering feature in the Coliseum is the revolving platform occupying a central position in the stage. The stage itself is one of the largest in this country, being 140 ft. wide by 85 ft. deep, and, being constructed entirely of steel, concrete, and teak, is practically non-combustible. The revolving platform consists of three concentric tables, the outer ring being 75 ft. in diameter. Each portion can be rotated in either direction by electric motors fixed in the basement at any speed up to 20 miles an hour. Immediately behind the revolving platform an electrically operated panorama can be placed, and it will readily be understood that an almost infinite variety of startling scenic effects may be obtained by the aid of these moving accessories. The operating switches for the revolving platform and the panorama are situated on a board at the back of the proscenium, so as to be under the immediate control of the stage manager. Above the stage a large grid and extensive flies are provided for raising, lowering, and manipulating the scenery, which can be rapidly moved in almost any direction by quick-running electrically-driven overhead carriers. The whole of the mechanical and electrical

equipment, was installed under the direction of Mr. E. Wingfield Bowles as consulting engineer, the architects being Messrs. F. Matcham & Co., and the general contractors Messrs. Patman & Fotberingham.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The usual fortnightly meeting of the Royal Institute of British Architects was held at their Rooms at No. 9, Conduit-street, Regent-street, W., on Monday, Mr. J. Belcher, the President, in the chair.

Architecture and Building Acts.

The minutes of the last meeting having been taken as read, papers on "Architecture and Building Acts" were read by Mr. Lacy W. Ridge and Mr. J. S. Gibson.

The title of Mr. Ridge's paper was "Building By-laws, Specially in Rural Districts." He trusted, he said, to be enabled to lay before the meeting the broad outlines of a scheme fit to be submitted to the Government, and embodied with proper consideration and due technical drafting in a Bill for presentation to Parliament in the coming session. That the oppression and inconvenience of the existing by-laws was being constantly more and more widely felt, was particularly shown by the formation of the Building By-laws Reform Association. As regards Mr. Justice Grantham's case, it could be no small degree of annoyance that could cause a Judge of the High Court to come down from the Bench in order to resist this action of the local authority in his district. Architects might take up the judicial position in this matter. Though the trouble these by-laws gave them was great, the quarrel was not directly theirs. Their views were the views of experts.

Dealing with the main grounds of objections to the rural by-laws, Mr. Ridge said that primarily and chiefly they were an interference with the liberty of the subject, out of all proportion to the necessities of the case or the good done by them. Again, the whole scheme was founded on the fallacy that in every district there were a large number of fit persons able and willing to serve on local administrative bodies, with no axes to grind, with plenty of time on their hands, and capable *inter alia* of drawing up a code of workable building by-laws. Another objection to the system was its unnecessary clumsiness. This was illustrated more particularly by the requirement of the deposit of drawings, and that no building could be begun without the previous approval of the local authority. Things in themselves manifestly of no importance had to be complied with to save the face of the by-law. This hard-and-fast ruling and keeping to the strict letter of their regulations by bodies who could not trust themselves to administer with common-sense in practice, put the public at the mercy of the least intelligent member on the board. It was said that local bodies should insist on the letter of the law all round, or there would be all sorts of jobbery. Perhaps that might be so. That was just his point. To say that was a confession that one could not secure in these rural districts, by popular election, men to be trusted with any discretionary powers, and if they were not fit to exercise discretion, they were not fit to have authority at all over the buildings of their district. The present condition of things was stopping building in the country, and, above all, was cutting off the supply of labourers' cottages. It was now generally recognised that there was no efficient way out of the difficulty except by legislation. With respect to this it was important to realise the proper limits of legislation. It was not for the law as a fairy grandmother to lay down in such a case as this that which was desirable or comfortable or even economical or good building, but only that which the public safety demands should be enacted and enforced by officials appointed for the public and paid at the public expense.

A Rough Draft of By-laws.

Mr. Ridge proceeded to submit a rough draft of by-laws which he considered would suffice for the general regulation of building so far as the public interest was concerned in ordinary rural districts. These proposals dealt with—(A) Notice to the local authority of the kind of building intended to be erected; (B) Width of Road; (C) The provision of Open Space for purposes of light and ventilation; (D) Damp Layer and Course—being a shortened form of By-laws 3 and 4 of the Local Govern-

ment's Model of 1903. The draft also contained regulations relating to sanitary arrangements; (E) Lobby to Closets; (F) Privy; (G) Soil-pipes and Wastes; (H) Disposal of Sewage.

Speaking of the disposal of sewage, Mr. Ridge asked: Have we not somewhat recklessly admitted the system of removing by water-carriage away from our houses matter which ought to have been returned to the land? Is not our wrong-doing constantly finding us out both in the smaller cases which we architects have to treat, and in the larger problems involved in the disposal of the sewage of our city?

One other subject (I) Party-walls, not included in the Model Rural By-laws of 1903, should, Mr. Ridge considered, most certainly be added, and be of universal application. The efficiency of the party-wall on small buildings for preventing the spread of fire was manifest. The Royal Institute had already submitted to the Local Government Board a carefully drawn clause on this subject, but it was neglected in the New Model in favour apparently of provisions as to the sizes of windows and heights of stories, which seemed to assume that the proposed buildings were to be carried out by lunatics. The Institute did not suggest that party-walls should be carried through the roof in small buildings, while in warehouses it suggested increased height, as in the London Building Act.

The by-laws proposed, Mr. Ridge considered, might be made universal in this country without oppression or inconvenience to the public. The system required no submission of drawings, no assent before building was to be given or withheld by any local authority, and the points were so little technical that such supervision as was needed could be given by any man who was fit to be appointed an inspector at all. When the local authority furnished sewers for the use of its district a new stage was reached. Plans showing the drains needed must be submitted, and the works to be executed agreed to as a condition precedent to having the use of the sewers. The author counselled the local authority and their officers to co-operate with architects in doing the best for the buildings under the special circumstances of each case, rather than regard their by-laws as the laws of the Medes and Persians, however useless and inapplicable they might be. The administration of by-laws with respect to the formation of roads and streets in the spirit of agreement rather than of command, would also do much to remove irritation.

Nothing, however, should be done to diminish the power of local authorities to deal with dangerous structures or places unfit for human habitation. On the other hand, it should be distinctly understood that these powers might be extended to deal with new buildings, should necessity arise.

The system proposed, well administered, would be far more useful to stop bad building than hard-and-fast by-laws. The local council and their inspector would soon discover the cases where intervention was necessary, and would leave the reputable builder, contractor, and architect alone.

Leaving London and the large towns out of consideration, the author considered his scheme sufficient for all practical purposes. In the most open country, and universally throughout England, space would be left for the roads, the cottages would not be huddled together, the laws of common cleanliness would be observed in sanitary matters, and material protection from the spread of fire would be afforded. The system suggested was simple, elastic, worked at small trouble to the local council, and with but few officials, and was applicable even in the smaller towns—in fact, until the stage was reached at which the community was justified in employing a really competent professional adviser.

Architectural Design and the Building Act.

Mr. Gibson, whose paper was entitled "Architectural Design and the London Building Act," said that the Building Act of 1894 was probably to the majority of London architects a series of regulations with which the artistic spirit was continually in conflict. The objects to be attained by a Building Act for such a city as London were twofold: first, in all matters relating to the construction of buildings it must contain such provisions as are necessary for the safety, health, and bodily well-being of the inhabitants, and in the arrangement and design of streets ample facilities for the carrying on of their daily work; while, secondly,

its regulations should be such as would encourage the mental growth of the people by providing an environment likely to stimulate thought and invention.

Laying Out Streets, etc.

As regards the primary object—viz., the safety, health, and bodily well-being of the inhabitants, generally speaking this had already been attained by the London Building Act. As regards the second, the design and arrangement of streets to afford ample facilities for the carrying on of our daily work, he thought the Act was not wholly inadequate, but had not even touched the fringe of the subject. This was amply proved by the constitution of a Royal Commission on the Traffic of London Streets. In the *personnel* of that Commission it was rather amusing to find that all architects had been ignored; and as far as he knew, no architect had appeared before it to express any views on the laying-out and design of London streets, yet if Sir Christopher Wren's scheme for laying-out the new streets of London after the Great Fire had been carried into effect, it is very probable there would have been no need for the present Royal Commission on Traffic, and Sir Christopher Wren was only an architect and surveyor.

When one realises the enormous annual loss to the community directly occasioned by the inadequate widths of the main streets in the central part of London, the lack of broad and direct lines of street communication east and west, north and south, on both banks of the river—when this is manifested day after day by the congested traffic in practically every main street within a radius of one mile of St. Paul's, group after group of cabs, motor cars, and buses intermixed with slow moving drays and carts stopped every quarter of a mile, the dislocation of streams of traffic occasioned by the loading and discharge of vans in Fleet-street, the Strand, Chapside, Bond-street, and such like thoroughfares, it must be patent to even the most indifferent that the time has come when, to put it on the lowest commercial grounds, the whole great question of the realignment of the main traffic arteries and their enlargement to the work to be done must be seriously taken in hand.

All new streets and the widening of those already existing should be part of one great scheme, conceived on large and generous lines, so that ultimately we should have a city of noble streets. As regards the laying-out of new areas on the outskirts of London, large estates are being continually cut up by the speculative builder into vast tracts of mean streets, lined with meretricious or vulgarly pretentious houses, disposed as he thinks best for himself, and with no regard to the surroundings, the main lines of traffic, or the fact that his area is an integral part of the whole town. The time has come when steps should be taken to compel the owners to lay out their land in the interests of the community as well as in the interests of the owner.

The utter failure of Shaftesbury-avenue, either as an adequate roadway or as an example of architectural street design, has evidently not been lost upon the authorities, for we find the London County Council setting out the Kingsway at 100 ft. wide instead of the 60 ft. of Shaftesbury-avenue, and this is a step in the right direction.

The author went on to compare the widths of important thoroughfares in London with those of Continental and American cities, and thought there would be general agreement with him that any amended Act should authorise the Council to provide for streets up to 100 ft. in width if the inadequacies of the present were to be obviated in the future.

Height of Buildings and Width of Streets.

The next point was the relation of the height of building to the width of street. In this connexion the author referred to an article in *The Builder*, of February 29 last, which, he said, dealt thoroughly with the point, and which he quoted at some length. The writer of the article expressed astonishment that in considering section 49, "the Institute Committee had made no protest against the absurd anomaly by which, according to the existing Act, a street 6 in. less than 50 ft. in width is restricted to buildings the same height as the width of the street, while a street 6 in. over 50 ft. in width may be lined with buildings 80 ft. high."

In buildings in the City of London the dominant factor governing the height was

usually the rights of lights of the opposite owners, and this had often determined the reasonableness of the heights of new buildings. When streets are increased beyond a width of 60 ft. the heights, he thought, might be also increased beyond the width of street without detriment to its architectural aspect. The author suggested the following as a schedule of maximum heights for streets within a radius of $\frac{1}{2}$ miles of St. Paul's Cathedral:—

Width of Street.	Ratio of Height of Buildings to Width of Street.	Approximate Lowest Buildings.	Approximate Highest Buildings.
Feet.		Feet.	Feet.
40 to 60	1-000	40	60
60 to 80	1-125	67	90
80 to 100	1-250	100	125

For streets outside the $\frac{1}{2}$ miles radius from St. Paul's Cathedral and within a 3 miles radius the heights should be equal to the widths of the streets, while outside the 3 miles radius the heights should be less than the widths of the streets, with a maximum height of $\frac{7}{5}$ of the width for streets of 100 ft. wide.

Air Spaces between Houses.

Another point of great importance is the provision of air spaces between the houses in the outer zones. The German regulation which stipulates for the outskirts of Berlin and other towns that there should be a space between the houses for aeration is a provision worthy of our serious consideration.

A further point is the provision of air-spaces to buildings, more particularly on corner sites in London, where by section 41, sub-section 4, the height of the building is limited to 30 ft. upon such part of the space at the rear of the building as the Council may think fit. It would tend to continuity of street frontage design if the restrictions as to heights of buildings on such rear spaces were abolished and percentages of areas of land to be covered substituted, and would render unnecessary the special applications to the Council which architects resort to only after they have tried every other expedient to obtain the effect they desire.

Minor Details of the Act.

Coming to the minor details of the Act which bear upon the design of buildings, the author dealt with the regulation governing the areas of openings and recesses in external walls. Section 54, he thought, was not properly drawn, even for a plain wall with openings and recesses in it, and as a regulation governing the whole subject of the relative areas of solids and voids in external walls of varied design and construction it was wholly inadequate.

The projection of cornices is a matter of very considerable importance in architectural design, and the arbitrary limitation to 2 ft. 6 in. met with wholesale disapproval. It should not be necessary, in streets of ample width, to set back the building line in order to obtain an adequate projection of cornice, as had practically been done under the present Act. Further, in streets of 50 ft. width and over, the projection of cornices, balconies, oriel, and bay windows should have fixed ratios to the width of street, and their erection permitted without having to make special application to the Council.

Some provision should also be made for overhanging eaves and verges, which do not strictly come under the heading of cornices, as there are great artistic possibilities in the treatment of wall-heads, gables, and pediments with overhanging eaves, and these would not interfere with the amenity of the streets in any greater degree than cornices of similar projection.

As regards the regulation governing shop-fronts, it would be a step in the direction of sober and logical design if it were made impossible to erect huge sheets of glass on ground and first floors. The public would welcome a return to more modestly-designed shop-fronts, and trade, he thought, would not suffer in consequence of the change.

The Institute had made some suggestions dealing with this matter whereby sufficient piers or other supports of granite, stone, brick, metal or other approved materials should be constructed from the level of the ground to the main wall of the superstructure above, and these piers should not at any time be covered with mirrors or otherwise concealed.

Mr. Gibson concluded by referring to three matters which he claimed to be of grave public importance:—

First, the lack of any provision in the present Act for the use of protected steel construction in buildings. Considering the advantages to be obtained by its adoption, the saving in floor space, the important bearing it had on the areas of support, the difference its proper use would make on the proportion of solids and voids in external wall design, it was greatly to be regretted that its adoption as a building material was not foreseen and provided for. Buildings were constructionally erected in this material, and then the external and other walls built around the steel in the same huge masses of brick and stonework as were necessary for buildings erected of the latter materials only. Practically the whole advantages of steel construction were nullified, and enormous masses of materials and labour absolutely wasted.

Secondly, he protested against the exemption of certain buildings of railway, canal, and dock companies from the operation of clauses 6 and 7 regulating matters of construction and design. One could only think with indignation of such atrocious structures as Broad-street, London-bridge, Ludgate-hill, and Victoria stations, to mention a few examples of the ill-doing of these private companies. It was nothing less than a public scandal that a great city like London should be powerless to insist on the instant removal of such structures.

The third point of public importance was the great desirability of all District Surveyors being practising architects. Nothing could be more inimical to the interests of the public, to the growth of architecture, to the beautifying of our streets, than to have as interpreters and administrators of a complex Building Act persons who, although highly skilled in technical knowledge and masters of routine, were inexperienced in the erection of buildings. In the interpretation of the various regulations dealing with complex modern buildings it was essential to have men who were experienced in modern architectural practice, men who knew the difficulties that were constantly arising, who were intimately conversant with the schemes of architects as judged by their designs. He commended to the consideration of all District Surveyors the second section of the Building Laws of New York—viz., "This ordinance is hereby declared to be remedial, and is to be construed liberally, to secure the beneficial interests and purposes thereof."

The author hoped that the attention of the City Corporation and the London County Council would be given to all the matters raised by the reading of the papers that evening, and that they would use every means in their power to further the development of London on lines that would give them a noble city.

Mr. Reed (Hon. Secretary of the By-Laws Reform Association) in proposing a vote of thanks to the readers of the papers, said they both dealt with subjects of immediate interest, but he could not help, perhaps maliciously, pointing out that they were somewhat mutually destructive. Mr. Ridge advocated legislation somewhat in detail as a remedy, while Mr. Gibson, who was dealing with the London Building Act, pointed out how rigidly that Act had been dealt with. That Act, if he might say so, was nothing but a glorification of by-laws put into an Act of Parliament. He hoped Mr. Ridge would forgive him if he differed from him in that part of his paper. He was glad to testify from his immediate experience of rural by-laws, and from past experience in connexion with the London Building Act of 1894, to the enormous assistance that gentlemen of his profession derived from being brought into contact in these matters with members of the architectural profession. He was one of those who felt that they should be able, outside the walls of Parliament, to meet and determine amongst themselves those things which were simply matters of detail, for it was impossible on the floor of the House or in Committee Rooms to deal adequately with questions of the construction of buildings, to use that as an example. If they were to get assistance in the matter, especially of rural by-laws, he would urge upon that Institute the desirability of avoiding anything like detailed legislation. That legislation was needed he entirely agreed, but what was wanted was legislation which would enable them as architects to have a free hand, so that they would be able, so long as they were doing what they considered was best for their clients, and their clients were doing what they considered was right for their

tenants and the public, to build such buildings as their experience had taught them were good and necessary for the purposes for which they were intended to be used. It might be Utopian, perhaps, to think they had only to say that a building should be good for the purposes for which it was intended. Of course, they had to meet with by-laws administered by local authorities as they found them, and not as they would have them, and his view was that it would be better to work in the direction of getting exemptions from by-laws and not in the direction of re-enacting by-laws which would get them into possible trouble. His view was that a code of by-laws might be framed which might be administered with the existing machinery without unduly hampering those who had to provide either large houses for the well-to-do or small cottages for the poor. This last point had been brought into a great deal of prominence lately, but he would not refer to any specific case. It had become a burning question how to make it possible to provide adequate accommodation within the means of those gentlemen whose incomes were derived from land, and it seemed to him that if they provided sufficient space and sufficiently sound cottages, beyond that nothing should be required. The Building By-Laws Reform Association had laid before Mr. Long their Bill, the main features of which he would give. The first point urged in the Bill was that houses, whether small or large, in places other than those covered by special building Acts, such as London and other large cities, should, subject to certain space being provided around them, be freed from all structural building by-laws. The second point was that the Local Government Board, where it finds the laws sanctioned by it are oppressive and unsuitable to the district in which they were being applied, should have power to substitute other by-laws. It seemed to him that these two things would enable the central authority and the local authority adequately to protect public interests in all directions. Probably the whole question was summed up in two small things. If they were really anxious to get immediate relief it could only be done by bringing forward a Bill which would offer the fewest points for opposition, because in the present state of legislature in the country, unless the Government would itself bring in a Bill, there was little chance of its being carried unless it contained the minimum of points for consideration.

Mr. Ridge said the last speaker had not quite followed out his proposition with regard to the Act of Parliament. His point was that the Act of Parliament should be passed solely and simply to enable the Local Government Board to take away all the powers which they had so foolishly granted to these urban bodies, and to substitute for them such simple by-laws as it should seem to them right to enact. That was his proposition, which could not be shorter.

Mr. G. Hubbard, in seconding the resolution of thanks, said they had heard two extremely interesting lectures. There was one point in Mr. Ridge's remarks which was not quite clear to him. Mr. Ridge spoke of seven new by-laws he was suggesting for the urban district councils. One was that the area at the back of the building should be of the full width of the buildings.

Mr. Ridge said that was not quite so. His suggestion was that the space area of every cottage and house should be equal to its own area on the ground floor level. His point was that they might put it where they liked, and in that way they would get rid of the question as to what was rear and what was front.

Mr. Hubbard said that did away with his point, and was much better than the present London Building Act, which required an area of the full width of the building at the rear. He did not know whether it had ever occurred to them that by-law made the building of terrace houses round a crescent utterly impossible. An architect he happened to know submitted some plans to the London County Council for some terrace houses round a crescent, and the London County Council, in their wisdom, refused to pass those plans because they said they were not in accordance with the London Building Act, and their argument was that it was impossible to build terrace houses on a crescent because of necessity the area at the back must be less in width than the width in front. The London County Council squared the matter. They said they wanted some

land on the other side of the road, and that if the architect's client would give up that land to them they would be quite prepared to pass the plans. Of course, it was not a proper equal exchange, but still the matter was got over in that way. Another absurdity of the matter of the width of roads must be apparent to them all. The London County Council had done it themselves, but other people could not do it without their consent, and that was to construct a crescent road; because the Act required that all new roads must connect directly between existing roads, and the County Council had resolved that a crescent was not a direct road, and, therefore, under their own regulation it was impossible to build a crescent road. The absurdity of the urban district councils by-laws was very much brought home to him some little time ago. He had received instructions to build a house for a client, and he had to set the building line 40 ft. from the road. After the house was complete his client wished him to add a billiard-room, and the only possible way of adding the billiard-room was by projecting 2 ft. 6 in. in front of the building line. He sent his plans to the urban district council, and gave notice that he would begin building. It was not necessary to obtain their consent to do that, for the Act only required that they should submit plans to them. He submitted his plans, and began his building, and their surveyor came down and viewed the trenches and approved of them, and saw the concrete, and so on; and he was putting on the roof of his billiard-room when he received a communication from the urban district council to say that the plans had not been passed. He inquired as to what was the matter, and was told that his billiard-room was 2 ft. 6 in. in front of the building line. He told them that the surveyor had passed it, and asked what they wanted him to do, and they replied, "set back the billiard-room." He told them it was impossible to do that, and the next thing was he was served with an injunction from the council, and he went before the magistrates. The magistrates said they were very sorry for him, and that the council had, in a sense, condoned the offence as their surveyor had passed the work from time to time, but they could not be blind to the fact that it was an infringement of the Public Health Act, and they fined him 20s. Well, he thought he had got off very lightly, and he again went on with his work. To his utter surprise he was again informed by the urban district council that he was not to proceed, and that they were going to bring another action against him. They said "that billiard-room is still in front of the building line." He replied that he had paid 20s.; and they said "that does not settle the matter; you paid 20s., but that was to condone the offence up to the time of the action, but the evil is still being continued." They brought another action, and he took it to the High Courts and judgment was given against him, and he had to pull down the billiard-room. When they came to consider that this was a large house standing in its own ample grounds, as the agent would describe it, and that there was not a house within a quarter of a mile on one side, and the occupants of the houses on the other side could not see the billiard-room at all, they would see the hardship. It was an absurdity that he should have been compelled to pull down a room which projected 2 ft. 6 in. from the building line where the house stood 40 ft. from the road. On the matter of the building line, there was something absolutely absurd in the working of the Act. Clause 3 of the Public Health Act said: "It shall be unlawful in any urban district without the written consent of the urban authority to erect or bring forward any building or any part of such building beyond the front main wall of the house or building on either side thereof." That meant that without written consent they could not bring forward any portion of their building in front of the main front wall of an adjoining building. Now, they could imagine a road with plots of land, and the man who put up the first building determined the building line. Perhaps the man next door wanted a large bay window, and as that must not be set beyond the main wall of the first building, the house has to be set back, and so a new building line was established. The next man might like a large front garden, and if he built right at the back of the land, under this Act no one could go in front of him, and the remainder of the sites would be absolutely worthless.

Mr. W. Woodward thought the papers were so important that the discussion on them should be adjourned to the next business meeting.

The Chairman said there was a business meeting on January 9, at which the discussion could be continued.

A member said that at the next business meeting they would have to deal with Bills before Parliament, and he would suggest that the discussion on Mr. Ridge's paper should not be mixed up with the discussion on the London Building Act.

Mr. Ridge said that he felt it would be a good thing if they could separate the two subjects, for they were totally different.

The discussion was then continued on Mr. Ridge's paper.

Mr. Woodward said that one of the great features of Mr. Ridge's paper was the very proper attack upon officialism. The whole base of architects carrying out architectural work was the interference of gentlemen more or less acquainted with the subjects with which they had to deal. They as architects knew of the narrow-minded interference which did not give any benefit to the public, but only led to loss of temper on the part of the architects and loss of money on the part of their clients. Take, for instance, the enormous number of drawings which they had to submit to the various local bodies. These authorities were not satisfied with one set of drawings, and in some cases a third copy had to be provided. They were inundated with paper and red tape, and the sooner they got rid of it the better. It had been asked why, with regard to the London County Council requirements for drawings, the architect should object as he did not have to pay for them. He was certain, however, that every architect would agree that one of the great difficulties they had to deal with was having to ask their clients to pay for the enormous number of unnecessary drawings. With regard to rural by-laws, they must all sympathise with Mr. Justice Grantham, for it was an instance where the whole trouble had been created by men not sufficiently informed upon the subject brought before them. It was impossible for the gentlemen composing local bodies to deal adequately with the matters brought before them, and if an architect or surveyor were employed he would be able to go through the drawings and initial them, and that was all that was necessary. What they had to deal with now, however, were delays and constant revision of drawings for no earthly good. In the case of drains, for instance, they had to submit drawings and plans of sections of each floor simply to show a water-closet on the first or second floor, and this was an absolutely unnecessary expenditure of time and money. If they only imported common sense into all the questions they would find that the evils which had been referred to would be disposed of. He could not agree with the Secretary of the By-Laws Reform Association that legislation should not be provided, and he thought that the by-laws suggested by Mr. Ridge were just the sort of outline by-laws which everybody should conform to. He agreed with Mr. Ridge that the area of the vacant land should be equal to the land covered with bricks and mortar wherever it might be. That would get rid of a great difficulty, and would ensure the necessary health space. As to being able to start a building before the drawings were approved, he did not see why a man should wait until it suited the convenience of local bodies before he could make a start. He thought that a man should be able to submit his drawings and then make a start, and if the surveyor saw that he was doing anything wrong he should call the attention of the architect to it, and not allow the man to go on with his building when he knew that something was being done in contravention of the by-laws. He believed that Mr. Ridge's paper would do a great deal of good, and if he could succeed in doing away with officialism and in reducing the consumption of red tape, and finally abolish the central authority in Whitehall, he would be doing a good thing.

Mr. Maurice B. Adams said that with regard to the question of drawings they must remember that a great many buildings were not carried out by architects at all, and this was important. They had to submit to a certain amount of red tapeism, and he felt that they ought to willingly submit to a certain amount and to go as far as Mr. Ridge suggested. One question which Mr. Ridge alluded to he spoke somewhat

feelingly about, and this was with reference to the width of roads. So far as he could understand the law at present the district council had no power to define the width of a road other than the minimum width of it. Very often great hardship arose where the road was made through a property adjoining other property. Perhaps a man had a plot of land and another man bought land at the back, and to develop this land he made a road with a width of 40 ft., which is the minimum width. If the road was made of this width right through, that might leave a strip of 5 ft. at the side of the first plot, and so the man making the road made it 45 ft. at this point, and did away with his strip, and so did not have to pay for the making up of the road. The local authority said they had no power, and that the person whose land was made to abut on the road would have to pay for the making up of the road.

He happened to be the possessor of a piece of land where that had arisen, and his tenant told him he should expect when his term expired to pay less rent, while he (the speaker) would have to pay for the making up of the road he did not want. That was a little instance of where it was necessary to fortify and assist the local council in order that they might protect the interests of the public and of individuals against that which was manifestly unfair. He did not know whether Mr. Ridge proposed that councils should have power to determine the width of roads, but so far as he understood at the present moment they had no such power.

Mr. J. H. Ball remarked that the debate had been rather disappointing, and he would like to ask whether the adjourned debate would be upon the regulations of rural district councils, or would it be upon any proposed by-laws.

The Chairman said it would be a continuation of their present debate, and they would take both. At times they all felt the oppression of rural by-laws, and they had great sympathy with those who had such experience. The chief point which both the readers of the paper had impressed upon them was the increase of officialism. What they wanted to have were men who could be responsible and who would not shrink responsibility; who would be men who had great experience and who were probably in active practice and who were able to determine each case on its merits. Mr. Ridge had suggested by-laws which concerned the community at large. Those were the points on which they required legislation, and then came the common sense of the official who would regulate their details. What was really required was a responsible individual to take up these things and deal with them separately.

The debate then stood adjourned till January 9.

STREET ARCHITECTURE.

A MEETING of the Applied Art Section of the Society of Arts was held on Tuesday evening, at the Society's premises in John-street, Adelphi, W.C., Dr. Longstaff, L.C.C., presiding, when Mr. T. G. Jackson, R.A., read a paper on "Street Architecture."

Ten years ago, he said, a paper was read in that room on the same subject by Mr. Beresford Pite, and he remembered saying that the old Strand had always struck him as being one of the most picturesque streets in Europe. It was too soon to pass a final verdict on the architectural result, but the old Strand which had delighted their eyes for so long had gone for ever, and it remained to be seen whether its successor would charm equally though in a different way. It was right, when sweeping changes, like those that were transforming this part of London, were being effected, to seek for and examine the principles that ought to govern street architecture. But these principles should not be kept for these occasions alone, and it was important that the true principles of street architecture, if they could be discovered, should be applied to works on a small scale as well as to those of grand dimensions. There was nothing, for instance, but good principles to prevent any freeholder from building or rebuilding his house in some incongruous fashion which would spoil a whole street. One principle which ought to govern street architecture was surely that consideration should be had for neighbouring buildings; because street architecture was social architecture, and it ought to conform to those rules of convention by which men in society were governed. Buildings in a town street could not indulge in the freedom that was

permissible to a house in the country any more than the owner could live in town with the same easy disregard of appearances that he enjoyed when he was away. Architecture might be guilty of social offences quite as much as the architect. Violent interruptions, startling contrasts of demeanour, disregard of the conventions of society, efforts to shout down and overpower his company, which would put a man outside the pale in the civilised world, find a very close analogy in the pretentious buildings that one often finds thrust into the streets and squares of London without the least regard for the style of the work they interrupt or the scale of the buildings they overshadow. Could anyone look without irritation at the north side of Cavendish-square, where the fine symmetrically-placed houses in the severe classic of 1770 were crushed by an enormous pile of nondescript architecture on one side of them; or look with satisfaction at the strange sky-scraping structure that mars the wholesome brick architecture of Hanover-square; or view without dismay the appalling intrusions that were breaking up and destroying the design of Regent-street, the one fine and consistent piece of street architecture in London? These offences were more flagrant and mischievous in proportion to the architectural value of the neighbouring buildings that suffered by them. An example was to be seen at Great Malvern, where a huge pile of building had been allowed to grow up actually touching the west end of the Priory Church, and overshadowing it. There was another at Bath, where a monster hotel overtops the east end of the abbey close by. A familiar instance is to be found at Milan, where the west front of the Duomo, despite its enormous size, is crushed into comparative insignificance by the new buildings, and the prodigious front of the Galleria on the north side of the Piazza. The first principle that he would lay down for town architecture was that there should be a consistency, a regard for the surroundings, an absence of vulgar rivalry in display, corresponding to that consideration for others which was the essence of good manners among individual men and women; that ordinary houses should subordinate themselves to buildings which, from their public uses or their architectural importance might fairly claim precedence; that, in fact, there should be a "comity" of conduct in architecture as well as in society; any violation of which should be condemned by public opinion as in bad taste, inartistic, and intolerable. Another consideration that arose out of this, especially when there was a question of cutting through old towns and forming new thoroughfares, was that when the alterations approach or touch beautiful buildings whether old or new, they should be designed so as to fit them, and bring out their beauties and enhance their architectural effect. This was a principle that had been much more attended to abroad than with us. The Louvre must have gained enormously by the construction of the Rue de Rivoli, and the old Tuileries by the formation of the gardens and the Place de la Concorde. With us, hitherto, this principle seemed rarely if ever to have been thought of, new streets and roads having been planned solely for convenience, easy gradients, and economy, with very little thought of artistic effect. What splendid opportunities had been missed, for instance, when the alterations were made at Hyde-park-corner, which, though they had facilitated traffic to some extent, had destroyed the little there was of orderly arrangement, when Decimus Burton's arch and screen stood in some sort of relation to one another. A still worse failure was that at the site of the old circus where Regent-street joins Piccadilly. The fault did not always rest with those who lay out thoroughfares in London. Considerations of economy had to receive attention, but they should not always be allowed to prevail over every other. When unusual opportunities occur of making a beautiful street, as for instance in the alterations of the Strand now in progress, it would be unworthy of a great capital to treat the matter solely or even mainly from the commercial point of view. It must not be forgotten that the present chance of making a fine thing would not occur again, and that a mistake made now from a too parsimonious motive would lay up a store of disgust and irritation in the future, and a bitter regret for a wasted opportunity. This however was what we are threatened with in the case of the Strand between Wellington-street and the Law Courts. As far eastward as the end of St. Mary's Church there seemed

nothing to complain of in the frontage line adopted. The debatable line was that east of St. Mary's, running from it to St. Clement's, about which there had been a great deal of discussion, and would probably be more. The new frontage lines as approved by the County Council signally failed to fit the lines of the churches of St. Mary and St. Clement, and it was one in which the very elements of true architectural treatment were not so much neglected as deliberately rejected. In no other capital in Europe would the economical question have been allowed to prevent so grand and important a scheme from being carried out in the best way possible. On such an occasion the Council could not fairly be accused of extravagance if it sacrificed something to those aesthetic considerations which had been brushed aside as if they carried their own condemnation with them. Another principle to be observed in altering or improving an old town should be that the general lines of the main streets ought to be respected whenever possible, and the general conformation of the plan as little altered as was consistent with public convenience. Considerations of convenience on the one hand and of beauty or sentiment on the other were seldom wholly irreconcilable. Streets were not, or should not be, mere mechanical contrivances for getting from point to point as speedily as possible. They had never been so regarded at any age but our own. One might almost say they were not so regarded now in any country but this. They should be beautiful and interesting, and so disposed as to show off their buildings to advantage and to preserve faithfully their historic traditions. One very awkward result would be avoided if the lines of old thoroughfares were taken in laying out new ones. Everybody must have noticed the sharp triangles to which corner houses come in most of the new streets that have been driven through crowded districts of London. They were caused by the fact that the general trend of the old streets lay obliquely to the line chosen for the new ones. In the new Kingsway towards the Holborn end the line was fairly square with the streets it passed through, but as it came south the street hears off obliquely, and this unsightly result would have the usual bad effect, unless the adjoining streets were altered also for some way outwards. But bad as these sharp-ended sites were for architectural effect, and inconvenient as they must be for internal plan, they were not so bad as the rounded ends and corners which had been the fashion in new streets. Rounded angles were seldom agreeable in architecture, and were best avoided. They deprived one of the firm outline and positive drawing which the eye demands in builder's work, and substituted for it a certain weak indefiniteness which was destructive of true form, and confused the elements of proportion. Whether in large or small buildings this rounding of the mass was equally injurious. Small buildings, perhaps, needed sharp square forms and positive outlines even more than large ones, and yet nothing could be less satisfactory to the eye than these rounded fronts on a great scale, as, for instance, the Grand Hotel at the corner of Trafalgar-square. In the case of a street entirely new from end to end, like Kingsway, many difficulties were absent. This was particularly so in the matter of scale. The buildings that lined Kingsway might be as large as they pleased. But in the case of the Strand this was not so. The proper scale was given there by the two churches and by Somerset House, and the new buildings must conform to that scale, if they were not to spoil the picture. Unfortunately this was not likely to be a consideration with either the London County Council or the lessees of the new sites, if one might judge by the beginning that had been made. Perhaps it was not too late to induce the Council to fix a height for the Strand fronts properly proportioned to the scale of the old buildings which gave the Strand its peculiar charm. We did not want an "imposing effect" as the report of the Improvement Committee called it, on the north side of the Strand. Let the "imposing effects" be reserved for Aldwych and Kingsway; but even there it was to be hoped that megalomania would not be allowed to run riot. In hot countries, where the sun was an enemy to be shant out, narrow streets between lofty houses were reasonable. But in England the sun was a visitor who never or rarely overstayed

his welcome, and we wanted as much of him in our streets as we could get. The houses of Regent-street and Oxford-street and of the untouched parts of the Strand were of the ideal height for our dim murky London streets. As to the best way of laying out street architecture on a general scheme, should it be treated as one whole, a single design to which every builder of a part must conform, or was the building line to be the only rule, and was all style, scale, and architectural treatment to be left to individual taste? Was the architecture of the street to be individual or collective, accidental or regular? There was much to be said for either alternative; but the unrestrained genius of the commercial architecture of to-day was to be regarded with misgiving. The result would probably be a competition in which every house would try to outshine its neighbours by cramping on more ornament, overpowering them in splendour and overtopping them in height. Better far than this the monotony of Gower-street or the unloveliness of Wimpole-street. The tide of self-advertisement was rising. It had laid nine-tenths of our architecture at its feet. Art was supposed to consist in ornament, and ornament was valued according to its quantity, not its quality. Perhaps the crucial difficulty of street architecture was the shop-window. In these days of display, it was thought necessary to abolish the front wall of the ground floor and to substitute huge sheets of plate-glass. The architect must reckon with these shop fronts, but how were they to be treated architecturally so as to be tolerable, or actually an element of beauty in a façade? To bring the new construction, consisting of two steel stanchions and a beam across, within the domain of art, it was only necessary that it should be visible. There was no reason why the stanchions and bresssumers should not be treated architecturally, instead of, as now, being concealed, so that the building appeared to be supported on the edge of a plate-glass shop front. Until we made up our minds that, if we accepted the new mode of construction by iron, we must break definitely with the traditions of brick and stone there would be no hope for us. Never was there so much talk about the advancement of art. Art schools covered the country and scholarships were showered on the students; but we should surely stultify ourselves if, when the time came for putting our pretended interest in art to the test, we chose the worse way of doing an important work instead of the better, from purely utilitarian motives.

The Chairman, in opening the discussion, said that the great problem was to impress on our municipal bodies the importance of those aesthetic considerations which were now so much despised. Unfortunately, aesthetic perceptions were not often found in combination with the sort of character which would lead a man to toil over municipal work day after day. As a rule, our municipal bodies did not represent the average taste of the nation. Not nearly enough attention was given to architecture as an art in this country. Architecture might be taught in connexion with history as well as with art, and then better-cautions of taste might be hoped for in the public. Our aediles in the present day did not know what was good and what was bad. The most hopeless thing in modern town architecture was the height of the buildings; but he feared there was no hope of imposing greater restrictions in this direction.

Sir J. Wolfe Barry said that at present the streets of London were inadequate for traffic which they had to accommodate, and there would probably be a great effort in the future to make new and wider streets, to prevent the loss due to congestion of traffic which now fell principally on the wage-earning classes. It was most desirable that these future street improvements should be considered from the artistic point of view as well as from the utilitarian; but of course utilitarian considerations must come first. The architect of the future must discard a great deal of what he had been taught of Roman, Greek, and Gothic architecture, which was not suitable for modern commercial life. He must study steel and iron construction and see how it could be made artistic. There was no reason why steel and iron should not produce a beautiful and harmonious whole. It would be difficult to improve, for instance, on Southwark-bridge as an iron structure, and the great arches of Blackfriars-bridge were not unworthy of admiration. If the big shop-window was a necessity of modern street architecture, the treated form of construction was the only one

which could adjust itself to the conditions. Until architects set themselves free from traditions which were not applicable to modern requirements, we should continue to be confronted with bastard styles of construction, both ludicrous and unsatisfying.

Mr. Reginald Blomfield said that architects must look to civil engineers to teach them how to deal with iron and steel. In this country we had not yet a sufficiently high standard of taste to warrant the setting up of an artistic directory of control in architecture. But it was the absence of any definite principle in the designing of our streets that had led to some of the horrible fiascos of the London County Council.

Mr. T. Blashill pointed out that taste changed radically in twenty years; and he thought that individualism ought to prevail over collectivism. If the public wished to have elevations to suit their taste, they would have to pay for them. When land was let by auction there was a limit to the restrictions which could be placed on designs. But if it were desired to have control over designs, why not let the land for a fixed sum, subject to the approval of the design, which thus would be seen before the bargain was completed?

Mr. Halsey Ricardo exhibited a design for a model street fulfilling modern requirements.

Mr. Mark Judge urged that there must be something wrong when land in such a position as that fronting on the Strand remained uncovered for months together.

The proceedings terminated with a vote of thanks to Mr. Jackson for his paper.

THE BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.

THE annual winter meeting of the British Association of Waterworks Engineers was held in the Lecture Theatre of the Geological Society, Burlington House, London, on Saturday, December 10. Mr. F. J. Bancroft (Hull), President, was in the chair, and among those present were Messrs. P. H. Palmer (Hastings), Dr. Kemna (Antwerp), W. Whitaker (London), C. E. Jones (Leyton), J. Hutton (Scarborough), C. Sainty (Windsor), T. N. Ritson, H. E. Stilgoc, W. Matthews (Southampton), W. Watts, Percy Griffiths, Secretary, and others.

The President read the report of the scrutineers, to the effect that Mr. P. H. Palmer (of Hastings) had been elected President, Messrs. W. Millhouse (Scarborough) and C. Sainty (Windsor), Vice-Presidents; and Messrs. C. Greenslade, W. Matthews, H. Ashton Hill, W. H. Humphreys, C. E. Jones, H. E. Stilgoc, J. S. Pickering, T. Bower, J. J. Lackland, and C. C. Smith, members of the Council for the ensuing year.

Mr. Palmer thanked the members for his election as President, and promised them a hearty welcome on the occasion of their visit to Hastings.

The President, on behalf of the members who attended the summer meeting of the Association in Belgium, presented Dr. Kemna with a silver tea and coffee service, suitably inscribed, in recognition of their appreciation of his services. He said that Dr. Kemna's urbanity, his stock of technical knowledge, and the heartiness with which his brother managers came to his assistance—all these things combined to make the visit an unqualified success.

Dr. Kemna, in acknowledgment, said a good deal of the appreciation of the members was due to the fact that they were favoured with good weather, and to his countrymen and friends, the waterworks engineers of Brussels, having done all they could to show how pleased they were to receive their visitors.

Warrington Waterworks Extension, Appleton.

A paper by Mr. George Mitchell on the "Appleton Extensions of the Warrington Waterworks" was read by the Secretary. He said the Appleton Waterworks were designed by the late Mr. J. F. L. Bateman, and were carried out in 1846, being extended in 1859 and 1901. Previous to the execution of the 1901 extensions (which were carried out under the Warrington Corporation Act, 1899), the works consisted of a storage reservoir of a capacity of 62 million gallons; two filters, having a sand area of 915 square yards; and a pure water tank of a capacity of 300,000 gallons. The pure water tank was originally covered by flags laid on girders, supported by cast-iron columns, but as the roof had been allowed to get into a bad

state of repair it was entirely removed about eight years ago. The effect, however, was the production of large quantities of green growth in the water, in consequence of which it was resolved to construct a new covered pure-water tank, and, the filtering area being inadequate at certain seasons of the year, the old tank was converted into two filters.

The old filters were rather shallow, so a slight excavation was necessary before the re-construction could be commenced. A thin layer of fine concrete was then spread on the bottom and carefully smoothed over. The bitumen sheeting was laid on this, and covered with a layer of fine concrete 5 in. thick, with a finishing coat of cement rendering. The sheeting on the slopes was protected by means of blue-pressed Staffordshire brick-on-edge paving, finished off with stone coping. Considerable difficulty was experienced in laying the bitumen sheeting owing to the pressure of the ground water during wet weather; but, holes being made good and the paving completed after the brickwork had set, no further trouble was experienced.

The filtering material consists of 2 ft. of sand, supported by gravel of an average depth of 10 in., supported on a false bottom of perforated tiles laid on lines of brindle bricks. This form of under-drainage has been in use on other works for at least thirty years.

The inlets to the filters are provided with Glenfield and Kennedy's non-concussive ball valves (fitted to act also as stop valves) to keep the water at a constant level, and the main drains discharge into wells containing Glenfield-Jones automatic regulators. The water is used exclusively for trade purposes, and the filters are merely required for the clarification of the water. Had the removal of bacteria been essential, the author would have increased the depth of sand to 30 in., and used finer sand for the top portion.

The capacity of the pure-water tank or service reservoir at the Appleton Works is 683,000 gallons. It is circular in plan, and constructed almost entirely of Portland cement concrete. As the trial pits disclosed the presence of a fairly good clay all over the site, the author at first proposed to use puddle-clay work, but after looking further into the matter this idea was abandoned, and it was determined to use Callender's bitumen sheeting as the water-tight medium. The chief objection to the use of this class of material being the high cost of the necessary protective covering (which sometimes exceeds 10s. per square yard), it occurred to the author that in such a shallow reservoir it might be possible to place the sheeting at the back of the wall instead of at the front, by which means, the soil being clay without any stones, all protective covering would be dispensed with. After consultation with Messrs. Callender this method was decided on. On the concrete foundation for the walls bitumen sheeting was laid of a width sufficient to leave a considerable lap at both sides, and, the walls having been built, the sheeting was continued up the back, being tied into the walls by small bolts with 6-in. cast-iron washers, placed about 30 in. centres horizontally and vertically.

With regard to the roofing of reservoirs, the author is of opinion that where thoroughly good work can be secured, cast-iron pillars form the ideal support, and these would have been adopted in this case had it not been for the difficulty experienced at the High Warren reservoir in securing the delivery of such in reasonable time.

In the Appleton Reservoir, therefore, the roof was supported on blue-brick pillars, 1½ bricks square. These were very long in proportion to their sectional area, and the author found great difficulty in arriving at their safe working strength, data on this point being very scarce. The pillars were recommended immediately the excavation was got out, in order that they might be thoroughly set before being loaded, and the greatest care was taken in selecting the materials and in levelling and planking the work at very frequent intervals. In fact, the labour charges of this work amounted to at least six times as much as in ordinary brickwork. The roofing consisted of 4 to 1 concrete, 4½ in. thick, with a tension bond of No. 8 expanded steel, carried on rolled steel joists at 7 ft. 8 in. centres. Care was taken to ensure the expanded steel being completely surrounded with cement mortar. The steel joists were not cased with concrete, but were given five coats of "siderosthen" paint, having

first been thoroughly brushed with wire brushes; a mechanical water-level indicator is fixed on the reservoir. The discharge takes place through an ordinary bell-mouthed pipe, with its invert 4 in. above the bottom. The cost of the reservoir was at the rate of about 3,400s. per million gallons capacity, which the author believes is fairly low considering the small size of the reservoir. The following details may also be of interest: The 6 to 1 concrete in walls cost 17s. per cube yard; 4 to 1 concrete in roof cost 23s. per cube yard; rolled-steel joists cost 9s. per cwt. fixed.

The Water Supply of Penzance.

A paper by Mr. Frank Latham, M.Inst.C.E., Borough Engineer and Surveyor, Penzance, on the water supply of Penzance and the hydrogeology of Cornwall, was also read by the Secretary. He said that until recent years the town of Penzance was entirely supplied with moorland water by gravitation from two open reservoirs of 12 million gallons total joint capacity. A few years ago, owing to improved sanitation and increased population, this storage became insufficient to meet the full requirements of a constant supply, and it was found necessary to supplement the works accordingly. During the winter months the reservoirs are well replenished with water, the quantity collected from the moorlands and conveyed into them being abundant, and more than 50 per cent. in excess of the consumption so long as the average winter rainfall lasts; but as soon as this decreased, that is from the end of May, the reserve is soon drawn upon.

In order to augment the supply during the four or five months of drought, pumping from a new well has been resorted to for the past three years. Pumping is limited to the periods when the supply of moorland water is insufficient, so that the cost of pumping is not continuous throughout the year. The water obtained from the well is much appreciated during the summer months on account of its low temperature.

During the first year of the new well being used the water thus obtained was mixed with the moorland water in the uncovered reservoirs, which by the middle of the summer contained more well water than moorland water. This well water, being now exposed to the action of the sun, favoured an abundant growth of objectionable green weeds of considerable length, and during the summer of 1902 the amount far exceeded anything of the same character seen in previous years, when mainly moorland water had been enclosed. These weeds gave a flat taste to the water, decomposed rapidly, and clogged the filters. When the quantity of well water was but small compared with the quantity of moorland water, the water stored in the reservoirs was found to remain pure and free from large growths of weeds for a much longer period. As regards chemical purity, the well water is far better for drinking and domestic purposes than the moorland water, but whether owing to its hardness or the presence of carbonic acid, or some other cause, the growth of vegetation develops to a remarkable degree directly it is exposed to sunshine.

A scheme has now been carried out which answers the twofold purpose of preventing the growth of weeds and giving additional water pressure to the higher portion of the town. For this purpose the author designed and built a covered service reservoir at a higher altitude than the existing reservoirs, and the water from the well is pumped into this, and not allowed to mix with the moorland water in the larger open reservoirs. The mains in the town have now been divided into two systems or districts, each having a separate supply main, one connected to the open reservoirs containing the moorland water, and the other connected directly to the big-level covered service reservoir containing the well water, which supplies the higher part of the town at a better pressure than was previously the case.

Seeing that the pumping operations are suspended during the winter months, some arrangement was necessary for continuing the higher pressure requisite for the upper district during that period. This was effected by close-piping the stream which conveys the moorland water to the reservoirs, the pipes, which were of cast-iron, being laid far enough up the stream to obtain a sufficient head for feeding the big-level reservoir. The object of storing well water in closed

reservoirs being to exclude sunshine rather than air, they should be effectually ventilated.

Dr. Kemna (Antwerp), Mr. W. Whitaker (London), Mr. C. E. Jones (Leyton), and others took part in the discussion of the paper.

Electrically-Driven Pumping Plant for Water Supply.

Mr. J. Hutton (Scarborough) read a paper on electrically-driven pumping plant for water supply and storage of water under pressure. He said this was a description of a pumping plant with reservoirs, etc., recently installed by him for the water supply of the village of Wykeham, Yorks, and for a nobleman's residence in that district.

It was at first proposed to use a windmill, but the high initial cost and unsightly appearance of these otherwise useful appliances decided him to recommend the use of an electric motor, worked by current obtained from the electric plant primarily installed for the lighting of Wykeham Abbey, which is situated about 1,200 yards from the spring. The motor is automatically controlled, so that no continuous attention is required, and the reservoir is continuously kept full. The well, generating-station, and reservoir are situated at the three corners of a triangle, the sides of which are from 800 to 1,200 yards in length.

The generating plant—which consists of loco-type boiler with enlarged fire-hox for burning inferior fuel; a compound medium-speed engine by Robey & Co., of Lincoln, developing 40 b.h.p.; dynamos; hooster; and 200-volt storage battery with a capacity of 470 ampere hours—is of the type usually adopted for electric-lighting. Current is conveyed from the generating plant to the pump motor through a concentric cable carried underground. The pumping plant consists of a three-throw pump with pistons 4 in. diameter by 6-in. stroke, working at a speed of 60 ft. per minute. The reservoir is situated 900 yds. from the pump-house, and is supplied through a 3-in. cast-iron pumping main.

The water-level in the well is 8 ft. below the surface of the ground, and the spring gives a supply of 90 gallons of water per minute, which is fairly constant all the year round.

The reservoir, built of blue bricks in cement, has a capacity of 45,000 gallons, and is divided into two parts in order that cleaning operations and repairs may not involve the stoppage of the supply. The total head against which the water is pumped is 98 ft., and the pump normally delivers 3,500 gallons per hour.

At the reservoir all supply and delivery valves are duplicated, and, in addition to the Wykeham village supply, a 5-in. main is carried to Wykeham Abbey, a distance of 900 yds., furnishing the ordinary water supply, in addition to feeding sixteen fire-hydrants placed round and inside the Abbey.

The plant, which has now been in operation for over a year, has quite equalled the author's expectations, having worked constantly without a hitch. The cost of the working has been found to be exceedingly low, and although it is somewhat difficult to give exact figures, owing to the power being used for electric-lighting as well as pumping, the cost of the proportion of energy used by the plant in fuel certainly does not exceed a penny per 100,000 ft. gallons.

The author has since had occasion to design a similar plant for supplying a neighbouring village, which, being situated on the top of a hill, involved the building of a water-tower, etc., obtaining working head by other means. This plant is practically identical with that just described, except that in this case, instead of a float, a pressure switch is used, it being opened or closed as the air pressure on a diaphragm is increased or decreased.

The author ventures to think that the problem of using electrical power for pumping the water supply of towns and villages is one which must inevitably come prominently forward in the near future.

Mr. R. S. Lloyd, Mr. T. R. Smith, Mr. C. Sainy (Windsor), Mr. C. E. Jones (Leyton), and Mr. Hutton contributed to the discussion.

The meeting closed with the customary votes of thanks.

"WILLING'S PRESS GUIDE."—"Willing's Press Guide" for 1905 (published at 1s. at 125, Strand, W.C.) is the thirty-second annual issue of a very well-arranged and reliable work. The present issue has been revised, and for conciseness and clearness it leaves little or nothing to be desired.

THE POST OFFICE LONDON DIRECTORY.

PROBABLY no yearly publication is so well known in London as the "Post Office Directory," and certainly no similar work can equal it for usefulness or surpass it for accuracy. The issue for 1905—the 106th annual issue—which has just been published by Kelly's Directories, Ltd., 182-4, High Holborn, W.C. shows that the same care in its compilation has been taken which characterised previous issues, while this year the labours of its editors have been considerably increased, for with the Directory has been included a considerable section dealing with the London County suburbs. In the combined work, the "Post Office London Directory" has been kept distinct from the section dealing with the county suburbs, and remains much the same as before, but the complete volume will be found to cover the whole of the County of London—that is, for the first time, to include those areas which have been previously looked upon as beyond the scope of the "Post Office London Directory" itself. The complete volume contains in its two divisions 4,600 pages (exclusive of advertisements), but, by the use of a finer paper and the resetting of a portion of the county suburbs section, the bulk of the combined directories in one volume is not greatly in excess of the "London Directory" alone in its usual form. Still, the combined work may be found by some people to be inconveniently bulky, and, to meet this possible objection, the "London Directory" can be had in the same form as in past years, printed on the same paper, but, of course, brought up to date. Or if subscribers prefer to have the combined work they can obtain it in two volumes. The Directory has been brought well up to date and other additions include: A list of the Metropolitan Water Board and a large map of the suburbs of London. The new Education Act has caused the omission of the London School Board, and has also rendered necessary a re-arrangement of the elementary schools.

Rapidly as the Metropolis grows, its growth would be far greater, were it not for a tendency on the part of many of its inhabitants to take up their residence in the Home Counties. In order to meet the want which the publishers believe to exist, they propose issuing the Directory of the Six Home Counties more frequently. A new edition of the first volume—containing the counties of Kent, Surrey, and Sussex—will be published about the middle of 1905, followed in 1906 by a new edition of the second volume, containing the counties of Essex, Herts, and Middlesex. These books will include the whole of their respective counties outside the boundary of the County of London.

DIARIES, ETC.

FROM Messrs. Hudson & Kearns (83, South-wark-street, S.E.) we have received specimens of their special diary blotting pads, which are very attractive and serviceable productions of their kind. No. 8A is a specially useful form, containing, in addition to blotting pad, a calendar, a diary with index and a tear-off indicator, and space for memoranda of appointments. The Banker's pad is another useful form, as also is No. 4, a portfolio pad.

A useful diary for architects and surveyors is Messrs. Waterlow Brothers & Layton's "Architects', Surveyors' and Auctioneers' Diary and Almanac for 1905." It includes full lists of members of the Royal Institute of British Architects, the Surveyors' Institution, and other professional bodies; information as to provincial architectural societies, and Government and public offices; an abridgement of the Towns Improvement Clauses Act, 1847; the London Building Act, 1894; Regulations and rules as to applications for the L.C.C. sanction, etc., under the London Building Act; and a list of District Surveyors, with their offices. The diary also includes much additional information of use to architects, surveyors, and others, but sufficient has been said to indicate the usefulness of this excellent annual. It is a handy and well arranged work, and is published at Nos. 24 and 25, Birchin-lane, E.C., at 3s. 6d. and 6s., according to binding.

The "City Diary" is a little work which gives three days to a page, is interleaved with blotting-paper, and contains a great deal of City information. The "Diary" gives a complete list of members of the Corporation, ranged alphabetically, and also according to their wards; and of the City churches, with the

names of the rectors, curates, organists, and other officials; of the City companies, with the names of the clerks, and the situation of the halls; and of the various municipal, social, and parochial institutions that have their headquarters in, or are in any way associated with, the City. The work is issued at 1s., and the publishers are Messrs. W. H. & L. Colling-ridge, 148-9, Aldersgate-street.

Calvert's "Mechanics' Almanack and Workshop Companion for 1905" is the thirty-second year of publication of a useful little work for artisans and handicraftsmen. In addition to information usually found in an almanack, it contains nearly seventy pages of notes and data for those connected with mechanical, electrical, engineering, building, and other trades. It is published at 4d.

Messrs. Bemrose & Sons, Limited, Snow-hill, E.C., have sent us specimens of their tear-off Shakespearian, etc., calendars and monthly diary, the published price of which is 1s. each. The tear-off calendars are made to open out and stand upon a table, or they can be hung upon a wall.

Messrs. Sprague & Co., Limited (4 and 5, East Harding-street, E.C.), have again issued their excellent little diary and tables, as well as a flat pocket-book suitable for the breast pocket. Both are very neat and useful little issues. The present is the thirty-sixth annual edition of the diary.

The Builders' Accident Insurance Co., Limited (Bedford-street, W.C.), have sent us a neat little pocket-book and a date indicator, which, presumably, they have issued to their subscribers.

The "Gloucester" Diary and Directors' Calendar for 1905 is the tenth year of issue of a diary published by Mr. Brooke, of Gloucester, for The Gloucester Railway Carriage and Wagon Company, Limited. The chief feature of the work is a list of stations and junctions attended by the company's wagon repairers.

Messrs. George Wragge (Manchester) send us a very characteristic calendar designed for them by Mr. Sydney E. Castle. It is in twelve square sheets, one for each month, with specially designed lettering and borders, and a sketch in line at the side of each sheet, illustrating the various kinds of work which the firm carry out.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Bethnal Green Borough Council 14,481l. for purchase of land, etc.; Fulham Borough Council 16,800l. for acquisition and laying out of open space, and 7,700l. for baths and wash-houses; Guardians of Hackney Union 24,600l. for poor-law purposes; St. Pancras Borough Council 7,515l. for electric light installation; Shoreditch Borough Council 9,189l. for street improvements and paving works, and 1,257l. for street lighting purposes; and Woolwich Borough Council 15,000l. for street improvement.

Lack of Employment.—The General Purposes Committee brought up the following report, the recommendation being agreed to:—

"In our report dated December 12, 1904, now before the Council, we stated that we had considered a letter from the Central Committee of the London Unemployed Fund with regard to the provision of facilities for the creation of work of public utility, for genuine unemployed workmen, and the matter was engaging the earnest consideration of the various committees. We have now to inform the Council that the committees have suggested certain works, such as digging, levelling, and preparing ground in connection with the Council's parks, improvements, housing schemes, etc., which will afford employment of the nature suggested by the Central Committee. We should point out that in view of the distress prevailing, owing to the lack of employment, the various spending committees had already taken steps to put in hand during the winter months as large an amount of work as possible. If the result of the distress prevailing, owing to the lack of employment, the various spending committees which are providing opportunities of work may proceed during the recess, we recommend—that the General Purposes Committee and the several committees which are providing opportunities of work to meet the exigencies of the unemployed in London be empowered to act during the recess, subject to the standing orders regarding expenditure."

Non-Provided Schools.—Replying to Mr. Pope, Sir J. W. Collins said the architect had now surveyed 332 non-provided schools, and the chief inspector had inspected 287 such schools, with regard to the staffing arrangements.

Enlargement of Royal-hill School, Greenwich.

—The following recommendation of the Education Committee was agreed to:—

"That the amended estimate of 4,415*l.* to be submitted by the Finance Committee in respect of the enlargement of the Royal-Hill School (*Greenwich*) by 172 places, and of other school-proper houses to be carried out at the same time in accordance with the finished plans approved by the Board of Education, be approved; that the work be executed without the intervention of a contractor, and that the drawings, quantities, specification, and estimate of 4,080*l.* be referred to the Works Committee for that purpose."

Sanitary Works, Old Castle-street School, Whitechapel.—The following was also agreed to:—

"That, subject to the Board of Education approving the plans and specification, an estimate of 1,016*l.* 11*s.*, to be submitted by the Finance Committee in respect of the execution of sanitary and drainage works at the Old Castle-street School (*Whitechapel*), be approved; and that the work be carried out without the intervention of a contractor as a jobbing work under the schedule in force for architectural jobbing works."

Proposed Adaptation of a House for House-wifery Centre, etc., Offord-road, Islington, S.—It was also agreed:—

"That the estimate of 603*l.*, to be submitted by the Finance Committee in respect of the proposed adaptation of the house, No. 6, Barnsbury-park, for the purposes of a house-wifery centre and school-proper house in connexion with the Offord-road site (*Islington, S.*), be approved; that . . . the work be executed without the intervention of a contractor as a jobbing work under the schedule in force for architectural jobbing works; and that the drawings and specification be referred to the Works Committee for that purpose."

School, Monteth-road, Bow and Bromley.—On the recommendation of the Education Committee it was agreed that the estimate of 5,75*l.*, submitted by the Finance Committee, be approved; that expenditure not exceeding 5,96*l.* be sanctioned in respect of the erection of a school for the accommodation of 80 mentally defective children on the Monteth-road site (*Bow and Bromley*), and also in respect of the provision of a science-room and a drawing class-room in connexion with the graded school; that the work be executed by the Council without the intervention of a contractor.

Roof Covers for Electric Cars.—The following recommendations were agreed to:—

"(a) That the estimate of 3,502*l.*, submitted by the Finance Committee, be approved; and that expenditure on capital account, of sums not exceeding that amount, be sanctioned in connexion with the provision of 100 additional roof-covers for the electric cars used on the London County Council Tramways.
 "(b) That the 100 roof-covers for electric cars, referred to in the foregoing resolution, be constructed by the Council's tramway staff, under the supervision of the chief officer of tramways.
 "(c) That an agreement be entered into with Messrs. Miles, Voss, & Co. for the payment of a royalty of 4*l.* 10*s.* for each of the 100 roof-covers to be made by the Council for its electric cars; that the solicitor do prepare, and obtain the execution of, this agreement; and that the seal of the Council be affixed thereto when ready."

Storm Floodings.—New Pumping-station in Battersea.—The Main Drainage Committee recommended and it was agreed:—

"That the estimate (No. 4,368) of 7,000*l.*, submitted by the Finance Committee, be approved; and that expenditure not exceeding that amount be sanctioned on account of the cost of the erection and equipment of a pumping station, on a site at the junction of York-road and Creek-street, Battersea, for the purpose of relieving floodings in Wandsworth and Battersea."

Office Accommodation.—The Establishments Committee recommended, and it was agreed, that the alteration of the premises known as Nos. 56 to 60, Strand, be executed by the Council without the intervention of a contractor, and that the drawings, specification, and bills of quantities be referred to the Works Committee for that purpose. The amount of the architect's estimate is 3,502*l.*

Lee-green Fire Station.—The following recommendations of the Fire Brigade Committee were agreed to:—

"(a) That expenditure not exceeding 12,700*l.* be authorised in connexion with the establishment of the proposed new Lee-green fire-station.
 "(b) That, in the event of the Works Committee being prepared to undertake the work at the amount of the architect's estimate (to be reported after the Christmas recess), the work of erecting the Lee-green station be executed by the Council without the intervention of a contractor, and that the drawings, quantities, specification, and architect's revised estimate be referred to the Works Committee for that purpose.
 "(c) That, in the event of the Works Committee not being prepared to undertake the work of erecting the Lee-green station at the amount of the architect's estimate, tenders for the erection of the station be invited by public advertisement."

Housing.—It was agreed, on the recommendation of the Housing of the Working Classes Committee:—

"That the estimate of 10,000*l.*, submitted by the Finance Committee in respect of part of construction to be made by the Council towards the cost of the acquisition and clearance of property on the Brantone-place and Prospect-terrace areas, be approved; that a payment on account of 10,000*l.* to the Council of the Metropolitan Borough of St. Pancras in respect of the expense of carrying into effect the Brantone-place and Prospect-terrace (*St. Pancras*) schemes, 1896, be authorised."

Suggested Removal of Charing-cross Station.—

A joint report was submitted by the Bridges and Improvements Committee on the reference made to consider the question of removing Charing-cross Railway Station to the south side of the river; to widen Hungerford Bridge; and to construct a double line of tramways over the bridge so as to link up the northern and southern systems of tramways. The Committee were of opinion that, having regard to the very large expense involved, and also having regard to the attitude of the South-Eastern Railway Company, there was no alternative but to advise the Council for the present not to give further consideration to the matter.

At the request of Mr. J. Burns the report was ordered to stand over until after the recess.

Paving.—The offer of Messrs. J. G. White & Co., Limited, to execute, at an estimated cost of 1,602*l.* 12*s.*, the paving and other works connected with the widening of Camberwell New-road, authorised by the London County Council (Tramways and Improvements) Act, 1901, was accepted.

It was also agreed that, in the event of the Works Committee being prepared to undertake, at the amount of the chief engineer's estimate, the execution of paving, etc., works connected with the widening of Blackheath-road, authorised by the London County Council (Improvements) Act, 1900, such works be effected by the Council without the intervention of a contractor.

It was agreed that the offer of the Council of the Metropolitan Borough of Battersea to undertake, at an estimated cost of 2,732*l.* 19*s.* 7*d.*, the paving and other works connected with the widening of York-road, between Edmond's-place and York-place, authorised by the London County Council (General Powers) Act, 1898, be accepted.

Main Drainage Extension and Storm Relief Works.—The Main Drainage Committee brought up the following report:—

"We think the Council may wish to be informed of the progress which has been made since March 31, 1904, in connexion with the scheme for the extension of the main drainage system and the scheme of flood relief works. The extension of the main drainage system additional main sewer accommodation in consequence of the large growth in population since the main drainage system was established. The estimated cost of the scheme is 3,600,000*l.*, and the actual or estimated cost of works completed or in progress amounted to 3,100,000*l.* on March 31, 1904, to 1,014,400*l.* Since that date the construction of the final section (2) of the new northern outfall sewer has been undertaken by the Works Committee, and work has already been commenced. The new sewer will extend from Old Ford to Barking. The length of section E, which extends from a point near East Ham manorway to the outfall works at Barking, is about 11 miles, and the estimated cost is 147,280*l.* The tender, amounting to 82,510*l.* 2*s.* 4*d.*, of Messrs. W. Kennedy, Limited, for the construction of section No. 1 of the northern low-level sewer No. 2 has been accepted, and work has been commenced. The new sewer will extend from Hammersmith to Bow, and section No. 1 comprises the portion between the River Lee, near Bow-bridge, and the western side of the Regent's Canal at Whitehouse. The tender, amounting to 348,417*l.*, of the Westminster Construction Company, for the construction of section D of the southern outfall sewer No. 2, has been accepted, and the work is about to be commenced. The new sewer will extend from the Crossness outfall works to the Deptford pumping-station; and section D, which is about 4½ miles in length, comprises the portion of the sewer from Deptford pumping-station to a point near Plumstead Railway Station. The tender, amounting to 81,252*l.* 19*s.*, of the Westminster Construction Company, for the construction of a portion of the new southern outfall sewer No. 2, has also been accepted; and under this contract, known as contract C, two sewers, each nearly half a mile in length, will be constructed, and the work has already been commenced. The borings for the portion of the new high-level sewer No. 2 between Plumstead and Catford, and for the new low-level sewer from Hyde Park-corner to Stepney, have been completed, and the surveys and construction of sewers have advanced. It is hoped that the contract for the sewer from Plumstead to Catford will be ready for letting in March next; and this sewer, when completed, will relieve the floodings in Leamhithe-ville. Lewis, in regard to the scheme of flood relief works, upon which we reported on February 16 and 23, 1904, considerable progress has been made. Application is being made to the Secretary of State for power to acquire compulsorily certain land required for the site of a new pumping-station at the junction of York-road and Creek-street, Battersea. A similar application is being made with regard to land required for a site for a new pumping-station at Shad Thames, Bermondsey, and the drawings and surveys for the new sewers in connexion with this station are well advanced. The tender, amounting to 30,732*l.* 8*s.* 7*d.*, of Mr. D. B. Peterson, for the construction of a sewer about 1½ miles in length from Cornwall-road, Notting-hill, to Upper Addison-gardens, Kensington, has been accepted; and this sewer, when constructed, will relieve the floodings in North Kensington. Messrs. D. D. Nowell & Sons, tender, amounting to 41,978*l.* 13*s.* 6*d.*, has been accepted for the construction of sewers, about 1½ miles in length, from the junction of South-street with High-street, Wandsworth, to the junction of Vardon-road with North-side, Wandsworth-common, and thence to the site of the new pumping-station, above referred to, at the junction of York-road and Creek-street, Battersea. The drawings for this pumping-station are being pre-

pared; and in response to an advertisement tenders have been received for the supply of the gas engines which will be required at the pumping-station. Tenders are also being invited from selected firms for the supply of centrifugal pumps, which will have to be connected with the engines at the pumping-station. This station and the sewers to be constructed in connexion therewith, will provide relief for the floodings in Wandsworth and Battersea. The plans for the new relief sewer from Holloway to the Thames are being prepared, and negotiations are in progress with respect to the land required. The plans for the relief sewer, about 14 miles in length, from Hornsey and Stroud-green, have been completed, and tenders will be invited as soon as the Council is in a position to proceed with the work. A plan, showing the several works referred to in this report, will be sent to members of the Council."

New Theatre, Shaftesbury-avenue.—The Theatres and Music-halls Committee reported that they had considered plans, submitted by Mr. W. G. E. Sprague, of a theatre proposed to be erected at the junction of Shaftesbury-avenue and Rupert-street. The site does not strictly comply with the regulations, as only one-tenth abuts on to a street of 40 ft. in width instead of one-sixth as required, but in other respects the site is a good one. The proposed building is shown to have seating accommodation for 1,144 persons. The application was agreed to on certain conditions.

The Council at its rising adjourned until January 24.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Strand.—An iron and glass shelter at the main entrance to the "Coliseum" on the east side of St. Martin's-lane, Strand (Messrs. F. Matcham & Co. for the London Coliseum, Ltd.).—Consent.

Hammersmith.—That the Council do approve of the elevation of a proposed gangway over Wood-lane, Hammersmith (Mr. I. Kiralfy).—Agreed.

Hackney, North.—Buildings on a site on the north side of Manor-road, Stoke Newington, between No. 4 and the Great Eastern Railway (Messrs. Turner & Holditch for Messrs. H. Merritt & F. W. Matthews).—Consent.

Hackney, Central.—A two-story addition at the rear of No. 16, Stanard-road, Dalston, to abut upon Riseton-road (Messrs. J. Hunt & Sons for Mr. G. Withey).—Consent.

Brixton.—Buildings on the site of Nos. 422 and 424, Coldharbour-lane, Brixton (Messrs. W. & J. Peacock for Mrs. M. J. Lockhart).—Consent.

Wandsworth.—Retention of one-story shops in front of Nos. 81 to 91 (odd numbers only), inclusive, Replingham-road, Southfields, Wandsworth (Mr. W. Hunt for Mr. J. R. Mayfield).—Consent.

Marylebone, West.—Permission to retain enclosures to a porch at No. 7, Mandeville-place, Wigmore-street, St. Marylebone (Mr. F. Cornelius-Wheeler).—Refused.

Wandsworth.—Four one-story shops on the east side of Cavendish-road, Wandsworth, abutting also upon the north side of Grove-road (Messrs. J. D. Mathew & Son for Mr. J. King).—Refused.

Whitechapel.—A building on the west side of Charlotte-court, Fieldgate-street, Whitechapel, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. G. E. Nield for Mr. M. Abrahams).—Consent.

Battersea.—Retention of a building at No. 110, Church-road, Battersea (Messrs. J. A. J. Woodward & Sons for Mr. J. Draper).—Consent.

Width of Way and Lines of Frontage.

Wandsworth.—Cottages, with bay-windows, on the site of "Swiss Cottage," Garratt-lane, Tooting (Mr. B. Woollard for Mr. C. Clements).—Consent.

St. Pancras, West.—A porch addition in front of "Rowton House," Arlington-road, Camden Town (Mr. G. J. Earle for Rowton House, Ltd.).—Refused.

Width of Way, Line of Frontage, and Construction.

Southwark, West.—A deviation from the plans approved for the erection of a luffing crane and platform on the north side of Bankside, and of a gangway across that street so far as relates to the erection of an enclosure to the crane tower (Mr. W. J. Perkins for Messrs. Harrison & Crossfield).—Consent.

Deptford.—A wood and iron building on a site on the northern side of Trundley's-road, Deptford, eastward of the Grand Surrey Canal (Mr. L. A. Jouques).—Refused.

St. Pancras, South.—For permission to retain teak and glass enclosures to the sides of an iron gangway connecting the third floors of premises on the north and south sides of Beaumont-place, Euston-road, St. Pancras (Messrs. Maple & Co., Ltd.).—Refused.

Formation of Streets.

Clapham.—That an order be issued to Mr. J. Cobeldick sanctioning the formation or laying out of new streets for carriage traffic upon the Heathfield estate, West Side, Clapham Common, Clapham.—Consent.

Clapham.—That the Council do not consent to the application of Mr. J. Cobeldick for an extension of the period within which new streets for carriage traffic upon the Heathfield estate, West Side, Clapham Common, Clapham, were required to be defined and thrown open to the public.—Agreed.

Wandsworth.—A barrier across Okburn-road, Totterdown estate, Tooting (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Mile End.—That an order be issued to Mr. A. Davis, sanctioning a new street for foot traffic only at the rear of houses in Hessel-street (late Morgan-street), Stepney.—Consent.

Deviations from Certified Plans.

Whitechapel.—Certain deviations from the plan certified by the District Surveyor, so far as relates to the proposed rebuilding of No. 1 and 2, Parliament-court, Artillery-lane, Whitechapel (Mr. C. H. Lovegrove).—Consent.

Means of Escape from the Top of High Buildings.

City of London.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, on the fifth and sixth (top) stories of Blocks "D" and "E," Broad-street-place, Eldon-street, City, for the persons dwelling or employed therein (Mr. C. D. Martin for the London Property Development Syndicate, Ltd.).—Consent.

Widening of Street, Width of Way, and Line of Frontage.

St. Pancras, North.—The erection of a building upon the site of Nos. 9, 11, 13, 15, and 17, Highgate-road, St. Pancras, to abut also upon Greenwood-place, and in connexion with such building the widening of a portion of Greenwood-place (Mr. G. H. Creetback for Mr. W. A. Curnock).—Consent.

Alteration to Buildings.

St. George, Hanover-square.—An alteration to Nos. 1 and 2, Thomas-street, Oxford-street, St. George, Hanover-square, so far only, however, as relates to the proposed construction of a bay-window at the rear of the premises, without such premises being in conformity with Part V. of the Act (Mr. L. Sharp for Mr. E. J. Rossier).—Consent.

Space at Rear.

Wandsworth.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the northern side of Carratt-lane, Tooting, with an irregular open space at the rear (Mr. B. Woollard for Mr. C. Clements).—Consent.

St. Pancras, East.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building at the rear of the "Mother Red Cap" public-house, No. 174, High-street, Camden Town (Messrs. F. J. Eedle & Meyers for Mr. E. L. Summers).—Refused.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

NORTHAMPTON ARCHITECTURAL AND ARCHAEOLOGICAL SOCIETY.—The Annual Meeting has just been held of the Architectural and Archaeological Society for the Archdeaconries of Northampton and Oakham. The Rev. A. W. Pultney presided, and Mr. R. P. Brereton gave an address on "Some Unrecorded Saxon Work in Churches in the Neighbourhood of Peterborough." Mr. Brereton prefaced his remarks with an explanation of a recently published book on pre-Conquest work, by Professor Baldwin Brown. In that book Northamptonshire figured, so far as numbers were concerned, fourth in England; but Mr. Brereton thought it would be agreed that in point of importance and general interest Northamptonshire stood second to none. Nine instances of Saxon work in churches in the county were given. These churches were Brixworth, which was the most complete, if not the most ancient, Saxon church Northamptonshire possessed; Earl's Barton, which contained the finest Saxon ornament

known; Barnack, Brigstock, Whittering, Geddington, with its almost, if not quite, unique arcade; Pattishall, Stowe-nine-Churches, and Creen's Norton. The chancel at Stowe was certainly Saxon, and a very fine example, but the whole tower ought to be added as an example of Saxon building. It might not strike an observer as such, however, by its appearance, and the natural inference would be that the tower was a recent addition. The nave of the very fine church at Creen's Norton was well preserved. There were other examples in Northamptonshire of which no notice had been taken in the hook to which Mr. Brereton had referred, two in particular. At Nassington there was an opening of a very decided Saxon character with a triangular head, and there were in the south aisle wall through-stones of typical long and short Saxon work. Another church, Wansford, possessed good specimens, which, if post-Conquest in point of date, were pre-Conquest in regard to style. Woodstone west window was also Saxon. At Thornhaugh there was an example which had previously been quite unobserved and unrecorded. Another interesting specimen—an ornament—had recently been discovered in the crypt of the church at Oundle. Mr. C. A. Markham, F.S.A., read a paper on "The XIVth Century Manor House at Yardley Hastings." This interesting and unique fragment of a bygone age, said Mr. Markham, once formed part of the large and important Manor House. It was probably erected by John Lord Hastings about 1330.—The annual report of the secretary was presented by Mr. C. A. Markham, and the Rev. E. L. Tuson, M.A., presented the financial statement. The officers and committee were re-elected *en bloc*, on the proposition of the Rev. A. O. James, seconded by Rev. R. C. Randolph.

EDINBURGH ARCHITECTURAL ASSOCIATION.—On the 14th inst. Mr. Nelson Dawson, London, addressed the members of the Edinburgh Architectural Association on the subject of metal work. The meeting was held in the Lecture Hall of the Geographical Society, instead of the Architectural Association's own rooms in George-street, and Mr. H. O. Tarbolton presided. Mr. Dawson's lecture was illustrated by lantern slides of examples of iron, silver, gold, and enamel work. At the close, Professor Baldwin Brown moved a vote of thanks to the lecturer. He made a passing reference to the proposal to utilise the Royal High School buildings for the purposes of art, remarking that whatever difference of opinion there might be regarding the suitability of the buildings for that purpose—and there was room for difference of opinion—they were all agreed that there must be no tampering with the exterior of the Royal High School. Mr. Ross seconded, and Mrs. Traquair supported the vote of thanks, which was cordially awarded.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of the Society on Thursday, the 15th inst., Professor Capper, of Manchester University, read a paper on "Choisy's Researches in Ancient Building Construction," Mr. C. B. Bulmer, President, in the chair. The lecturer said that Choisy's researches into ancient Egyptian building construction follow his previous detailed studies, along similar lines, of Roman and Byzantine work, extending over a period of more than thirty years. To Egypt he has brought the same power of penetrating analysis of constructive fact, the same keen insight into the practical necessities of building organisation and method, that illumined so admirably his account of ancient Roman building, as well as of the succeeding school of architecture at Byzantium. Choisy's researches in Egypt, though not apparently the result of prolonged residence, and suffering from a curious ignorance of much recent work on Egypt and new data so derived, give undoubtedly an epoch-making study, presenting some well-known facts in altogether new relationships, and giving us daring and reasoned solutions for many problems hitherto apparently insoluble even to experienced Egyptologists. As one of the most important of these solutions of long-standing enigmas, the lecturer gave in detail, with lantern illustrations from Choisy's book, the minute study of Egyptian brick walls, built with undulating bedding, a puzzle that has hitherto baffled every inquirer. As demonstrated by Choisy, these curious walls, which occur on a large scale at Karnak, Abydos, El Kah, Philae, and elsewhere, are the logical outcome of Egyptian crude-brick building on

sloping sites, given the scanty foundations possible in Egyptian soil, where these walls are liable to attack by the waters of the Nile. Similarly Choisy, by a single illuminating paragraph, accounts for the well-known bench on the sides of the ascending gallery in the Great Pyramid, admittedly unexplained in Professor Flinders Petrie's classical book on Gizeh. The lecturer then gave an account of Choisy's explanation of the transport of material, whether in the enormous blocks of obelisk or colossal statue or of the materials of more moderate dimensions used in ordinary building, and of his very ingenious demonstration of the use of sand for the nice adjustment of the great blocks in position.

MANCHESTER SOCIETY OF ARCHITECTS.—The forty-first annual dinner was held on the 16th inst., at the Queen's Hotel, of the Manchester Society of Architects. Mr. J. W. Beaumont, President of the Society, occupied the chair. In submitting the toast of "The Royal Institute of British Architects," the President said that at the present time there was no country in the civilised world in which there was not a member of the Royal Institute of British Architects. If the registration of architects became law the Institute would become the registering and examining body. But if this did not come to pass the Institute was intending to take into more serious consideration the education of architectural students, upon which the good of the profession seemed to him to stand. Mr. T. E. Colcutt, Vice-President of the Institute, and Mr. John Slater responded to the toast. Mr. A. J. Murgatroyd proposed "The Victoria University of Manchester." Vice-Chancellor Hopkinson, in his reply, said nothing had given him more satisfaction than to know that the School of Architecture was an accomplished fact. The manner in which it had been started was a model of how things ought to be done in Manchester. The University and the Manchester Society of Architects had worked harmoniously together from the first, and he could not fail to acknowledge the obligations of the University to the two representatives of the architectural profession—Mr. Beaumont and Mr. Ogden. Dr. Hopkinson regarded the fact of the University and the architectural profession working together as one of the indications that Manchester recognised there was a future for English architecture and that that future would only be brought about by the union of architectural skill and knowledge, artistic study, and talent with those who were engaged in theoretical studies, the study of letters and of history.—The toast of "The Architectural Association" was proposed by Mr. Charles Heathcote and responded to by Mr. E. Guy Dawber (President of the Association). Mr. Alired Darbyshire proposed "The Manchester School of Architecture," and Mr. Charles Rowley replied. Mr. Rowley pointed to the successful working of the school as an augury of still better things for architecture and a love of the beautiful in Manchester. He was quite certain, he said, that in Manchester there were some of the finest buildings to be found in any city.

ULSTER SOCIETY OF ARCHITECTS.—The annual dinner of the Ulster Society of Architects was held in Ye Olde Castle Restaurant on the 15th inst. Previously the annual general meeting of the Society had been held in its offices, 13, Lombard-street, under the presidency of Mr. W. J. Cilliland. The report of the Council and of the honorary treasurer's account were of a satisfactory nature. The following office-bearers and council were elected:—President, Mr. W. J. Gilliland; vice-president, Mr. J. J. McDonnell; honorary secretary, Mr. W. B. Fennell; assistant honorary secretary, Mr. W. W. H. Patterson; honorary treasurer, Mr. F. H. Tulloch; council, Messrs. H. Seaver, N. Fitzsimmons, and R. M. Young; associate members of the council, Messrs. Thomas Houston and E. R. Kennedy; auditors, Messrs. Vincent Craig and J. St. J. Phillips. Mr. Benjamin Morrison was elected a student of the Society. At the dinner Mr. W. J. Cilliland again presided. The usual loyal toasts having been submitted from the chair and honoured, that of "The Learned Professions" was submitted by Sir Thomas Drew. Rev. Dr. Hamilton, in reply, mentioned the great service rendered to the nation in the capacity of architect by Sir Thomas Drew, and said that lately he had the distinction of being the architect of the new cathedral in Belfast. It seemed to him that of all the professions

having a claim to be included in that toast architecture stood out prominently. Their President made an admirable statement, adducing almost irrefutable arguments before the Royal Commission on University Education in Ireland two or three years ago, when he preferred a strong claim for suitable training of candidates in architecture. Mr. Gilliland asked that in any arrangements made for the development of university education architecture should have an acknowledged place, and that a Chair of Architecture should be provided for it in Queen's College. He (Dr. Hamilton) hoped the time would come when a great change would be made in all the university arrangements, and when that time came, he hoped the architects would receive the recognition to which they are justly entitled, and that a profession which has done so much for the health of the people would be admitted to the position it ought to hold in the learned professions. The toast was acknowledged also by Dr. Calwell, President of the Ulster Medical Association. Mr. Vincent Craig then proposed "The Royal Institute of Architects of Ireland," testifying to the efficient guidance of the parent body, and response was made by Mr. Mitchell (President) and Mr. Open (Honorary Secretary). Mr. R. M. Young, J.P., submitted the next toast, that of "The City and Trade of Belfast," Messrs. A. Cooke, H. A. Cutler (City Surveyor), and R. B. Henry responding. The toast of "Our Guests," submitted by Mr. Henry Seaver, had associated with it the names of Professor Symington, President of the Natural History and Philosophical Society, and Mr. John Vinycomb, President of the Ulster Arts Club. President Hamilton proposed the toast of "The President of the Ulster Society of Architects," and Mr. Gilliland briefly responded.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—At the meeting on December 29, Mr. Arnold Mitchell gave an address on "The Study of Mediæval Architecture." Commencing with an illustration of the nave of Southwell Minster he emphasised the nobility of Norman architecture and the way in which the builders had grasped the great principles, such, for example, as the desirability of massing the ornament and of ornamenting construction. The ornament is of the simplest and easily made with the axe on the small stones employed, and yet it is effective; the orders of the arches were recessed owing to the small size of the stones, each order being composed of one stone. The small size of the stones played a very great part in the construction of XIIIth century buildings, since the piers were, in consequence, far larger than was otherwise necessary, and the roofs of naves could not be vaulted. Mr. Mitchell then traced the growth of vaulting from the "concrete dome" of the crypt at Canterbury to the quadripartite ribbed groined vault over the aisles at Peterborough, and so on to the vaults over the Chapel of Henry VII. in Westminster Abbey, and at Cowdray Castle, which have again become ornamented domes unsupported by the ribs. The ribs were at first introduced to support the groins, but were multiplied until they only ornamented the vault, and did not support it. Dealing with the arch, Mr. Mitchell showed the growth from the triangular arch built of Roman tiles at Colchester to the semi-circular arch also formed of Roman tiles at Brinworth, until the true arch with voussoirs was built. The triangular arch of tiles was no better than two concrete beams laid sloping, with a vertical joint at the head, and the semi-circular arch of tiles was supported by mortar voussoirs separated by tiles, since they alone had the correct shape. The arch became sub-divided into two lights by smaller arches, and the tympanum was at first ornamented simply as in the westernmost bays of the triforium on the north side of the choir at Peterborough, but later was pierced as in the eastern most bays, and from this sprang window-tracery, or ornamented with sculpture, as in the "Priest's" door, at Ely.

Mr. Francis Bond, in proposing a vote of thanks to Mr. Mitchell, suggested that the arches were built in recessed orders in order to save centring, wrought wood being scarce, and that the same cause may have been the reason why the greater spans in our cathedrals were not vaulted; while the small size of the stones used may have been caused by the bad state of the roads rendering the carriage of large blocks impossible. Mr. T. C. Yates seconded the vote of thanks, and referred to the traces of colour and gilding he had found when measuring the Angel Choir at Lincoln.

Mr. R. Wellby thought the Roman roads would still be in good condition in the great building period. The next meeting will be held on January 10, when Mr. W. M. Dodson will lecture on St. David's Cathedral.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The second meeting of the session was held at the rooms, 32, Sackville-street, Piccadilly, on Wednesday, December 14, at 8 p.m., Dr. W. de Gray Birch, the Treasurer, in the chair. Dr. Winstone exhibited a fine pewter tankard and drinking cup, both bearing the pewter stamp, and seemingly of the XVIIth century, the tankard being the older of the two. Dr. Birch, having examined the coat of arms upon them, expressed the opinion that they had belonged to the Kent branch of the Baker family. Dr. Winstone also exhibited a very nice example of Battersea ware in the shape of an oblong snuff-box and the Rev. Dr. Astley in character to the Battersea specimen, but which, Dr. Birch said, was of German make and intended for sweetmeats; both were of the XVIIIth century. Rev. Dr. Astley exhibited, on behalf of Mr. Selley, some interesting finds from the Bristol neighbourhood, including a stone knife and flint implements, and a perfect pigmy arrow head. The Chairman exhibited a Cypriote antiquity of about 500 B.C., found by Cesnola, consisting of a rude kind of toy horse of clay, in perfect condition.—Mr. Emanuel Green read a paper upon "Bath old Bridge and the Chapel thereon," which had special interest for the meeting as the recent Congress had been held in that city. The question of the origin of early bridges, he said, is of interest, as, possibly, leading to a knowledge of some curious point or episode in local or personal history. Any very early notice, however, could only be met with by chance. On making a reference to local histories it would be found that the writers said little or nothing of the bridges, necessarily so, because nothing was known about them, yet, notwithstanding, bridges and bridge building were matters of public importance and of general taxation from which no one could be excused. Ducange mentions a guild of bridge builders known as *Frates Pontis*, the habit worn being white with a cross on the breast. The *Saxon Chronicle* tells us that after his attack on London, 1013 A.D., King Sweveic went "westward to Bath and sat there with his force." To him came the Western Thanes and submitted and gave him hostages. Whether any Thane crossed the Avon by a bridge or by a ford there was no mention. Florence, of Worcester, and others, mention the coming of a party from Bristol, in rebellion against William Rufus, when Bath was burned and pillaged, but there was no intimation that it was approached by a bridge. In 1209, 1212, 1213, and again in 1216 when King John came to Bath, he must have crossed the river, but there was no reference to a bridge or a ford. Licences for pontage, i.e., a duty paid on all articles carried across a bridge, could be occasionally found for other cities, Bristol, for example, but there was not one for Bath. This arose from the fact that the early bridge there was at some distance from the south gate, was not united to it and did not form actually a part of the city. The first and only early mention of a bridge at Bath was in 1273, in the Hundred Rolls, Edward I., but there must, with fair certainty, have been a bridge before that date, probably, built mostly of wood. The early local historians knowing nothing of the early bridge were in difficulties, and their descriptions of the bridge and chapel are quite inaccurate. The chapel spoken of by them was built upon one of the piers of the bridge, and was too small to have been anything more than a resting place for some painting or image, or a housing (to use a word found in early writings), or a place for a passing prayer. The paper was illustrated by reproductions of the unique and exquisite views, now in the British Museum, which were taken in 1718; they preserve for us a clear idea of the structure, chapel, piers, gate, and abutments complete. The Chairman, Mr. Kershaw. Mr. Gould, Rev. Dr. Astley, Mr. Bagster, Mr. Patrick, and others joined in the discussion which followed.

QUEEN VICTORIA MEMORIAL, SHEFFIELD.—The erection of the Sheffield memorial to the late Queen is now nearing completion. Mr. Alfred Turner is the sculptor of the monument.

THE TRAMWAY AND LIGHT RAILWAY ASSOCIATION.

On December 16 a visit was made by the members of this Association to the works of the Great Northern and City Railway, and of the City and South London Railway.

The Great Northern and City Railway, as most of our readers are aware, is a low-level tubular line with one terminus at Finsbury Park, beneath the Great Northern Railway station, and the other at Moorgate-street, with intermediate stations at Drayton-park, Highbury, Essex-road, and Old-street. The tunnels are the largest of the kind hitherto constructed in London, being 16 ft. in diameter. Therefore, it is possible to take main-line vehicles, or even the largest Pullman cars, into the tubes. The diameter of the station tunnels is 21 ft. in the case of intermediate stations, and 25 ft. at each terminus. The crossover just outside Moorgate-street station is 32 ft. high by 50 ft. wide. In the construction of the running tunnels a new method was introduced, on a considerable length of the line, by forming the lower half of the ring of brickwork, the upper half being of the ordinary cast-iron segments. This arrangement was proposed by Mr. E. W. Moir, M. Inst. C.E., and, we are informed by the officials, that it gives a more elastic road-bed than is the case where iron segments are used entirely. A noticeable feature is that, throughout the line, no combustible materials were used in the tunnel or platform construction. The rolling stock consists of motor and trailer cars, made up into trains of various lengths to meet the traffic requirements. Each motor-car is fitted with two 125 h.p. motors, the controlling gear of which is placed in a fireproof compartment at the end of the coach. All the cars are fitted with Westinghouse quick-acting brakes, and each motor-car carries an automatic, motor-driven compressor. The sidings, car-sheds, and repair shops are situated at Drayton-park, where the line emerges into the open air. Of the lifts provided for conveying passengers to and from the trains, those at Moorgate-street and Essex-road are electrically-driven by motors placed over the lift shaft. At Highbury and Finsbury Park stations they are of the direct-acting hydraulic type.

On arrival at Moorgate-street station, the visitors were met by Mr. R. P. Brousson, the Engineer and Traffic Manager of the Great Northern and City Railway, by whom the working of the line was explained at length. After inspecting examples of the rolling stock the party proceeded to the crossover outside the terminus, where the most interesting feature is the arrangement of the running rails and electric conductors. Contrary to the ordinary practice, two conductors, negative and positive respectively, are employed, both of these rails being electrically insulated. Current is collected by eight slippers attached to each motor-car, two being placed at each end, and four at intermediate positions, so as to bridge over gaps at points and junctions. The party next visited a typical signal cabin at Old-street station, where the method of signalling was clearly demonstrated. The system employed is entirely automatic, and has a "treadle" control worked by the cars. The necessary low-voltage current being supplied from the running rails of the permanent way. A train entering any section controlled by a signal sets this signal to danger, and locks it until the train has passed out of the section, when a controlling relay is energised, and the last coach makes contact with the treadle and releases the signal. It should be noted, however, that the signal in advance must have been placed in the danger position before the signal in the rear can be operated by the treadle. From Essex-road station the visitors walked to the generating station, situated on the southern bank of the Regent's Canal, close to the New North-road bridge. Outside the power-house, a building on an L-shaped plan, and close to the canal bank, are a coal bin, an ash bunker and shoot, and a small pumping station. Coals are unloaded from barges by a Hone's grab, delivered into the bin, and mechanically conveyed to the coal bunker inside the boiler-house, all the coal passing through an automatic weighing-machine on its way to the bunker. When required, the same conveyor brings back ashes, which are delivered into the bunker, whence they are loaded up into barges or carts by means of the shoot. The pumping station is situated below the coal bin, and draws water from a well, for augmenting the ordinary supply, and for use in case the latter should be interrupted. Near the pumping-house is a vertical shaft, at the bottom of which a heading runs to the railway tunnels at a point between Essex-road and Old-street stations. The heading serves as a conduit for the electric cables, as well as to convey fresh air, propelled by a fan, into the railway tunnels for

ventilation purposes. In view of the large cross-section of the tunnels, and of the fact that the greatest underground length is not more than two and a half miles, it is believed that this heading will be adequate for the provision of fresh air. Another favourable circumstance is that the openings between the two tubes are strictly limited, both in size and in number. Hence the movement of the trains will afford considerable help in the way of ventilation.

The generating plant consists of four Musgrave vertical, cross-compound, condensing engines, each of 1,250 h.p., direct-coupled to British Thomson-Houston direct-current, compound-wound generators placed between the high and low-pressure cylinders, and furnishing 575-volt current at full load. Two auxiliary generators, driven by high-speed Davy-Paxman engines, supply current for lighting. These generators are rated at 120 kw. each, and give the same voltage as the main generators. The main switchboard is arranged so that, if necessary, the lighting circuits can be supplied from the traction panels. The steam generating plant includes ten "Economic" type boilers, each capable of evaporating 11,200 lbs. water per hour. The boilers are fitted with Vicar's mechanical stokers, driven by electric motors in the basement. The stokers are fed from the coal bunker at the top of the boiler-house, the storage capacity of the bunker being about 1,000 tons. Ashes are raked from the boilers into hoppers below the floor of the boiler-house, each hopper having a valve at the lower end which discharges into the conveyor buckets. Messrs S. Pearson & Son were the contractors for the construction and equipment of the line, under the supervision of Sir Douglas Fox as consulting engineer.

The members of the Association next paid a visit, at the invitation of Mr. Thomas C. Jenkin, the general manager, to the new power station of the City and South London Railway, at Stockwell. The original generating station contained four 400 h.p. generating sets, but the extension of the line to Clapham Common and the further extension to Islington, necessitated a great increase of power, and more suitable means of conveying it to the trains. The two-wire system at first used became inadequate owing to the increased length of the line, heavier trains, and more rapid services. Hence the company decided to adopt the three-wire system, which, although largely used for electric lighting, had not been applied to traction.

About the same time, an entirely new power station was built, capable of extension to double its present capacity, the old generating station being dismantled and utilised for locomotive and repair shops. The new station is a brick and steel building, 200 ft. long by 90 ft. wide, the engine and boiler houses being practically under one roof. The power house contains fourteen dry-back marine type boilers, and seven generating sets, with a maximum engine capacity of 5,500 h.p. Part of the line is supplied with current at 500 volts direct from the generating station, but more distant sections are supplied from substations at London Bridge and Islington, where current received at a potential of 1,000 volts is stepped down to 500 volts. At each point of supply, storage batteries are installed to provide for station lighting, and for working the electric lifts. The batteries also steady the generator loads, and are available for the supply of current in case of temporary interruption to the station supply. To afford accommodation for increasing traffic, more powerful and faster locomotives have been provided for hauling four-coach trains. Ten new four-coach trains of improved design have been brought into service, and the older cars are being reconstructed on similar lines. The rolling stock of the company now includes fifty-two locomotives and 140 coaches, as compared with fourteen locomotives and thirty coaches four years ago. In conclusion we may mention that the station tunnels at Islington and Clapham Common are each of 30 ft. diameter, and are the largest in the world.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of Mr. T. Fairhurst as a sanitary inspector in the Metropolitan Borough of Southwark, and the temporary reappointment of Mr. W. Peverett as a sanitary inspector in the Metropolitan Borough of Hackney.

CHINGFORD OLD CHURCH.—The Rector of Chingford is desirous of obtaining contributions for repairs to the chancel, porch, and tower of Chingford Old Church, necessitated by the recent fall of the roof of the nave. Every effort will be made to preserve the picturesque character of the ruin, which was illustrated in the *Builder* of July 2 last.

WESTMINSTER CITY COUNCIL.

A SPECIAL meeting of this Council, convened for the purpose of receiving reports from the Highways and Works Committees as to providing further work for the unemployed, was held at the City Hall, Charing Cross-road, on Friday last week.

The Works Committee's report dealt with the advisability of at once repaving certain macadam roads in the City and the repaving of Exhibition-road with wood. The City Engineer stated that provision could be made for the employment of additional men by engaging additional steam-rollers for the repair of macadamised roads and by relaying wood pavements in various sections of Shaftesbury-avenue, Great Windmill-street, and Kensington-road with materials now in stock. The Committee recommended that the work should be put in hand at once; but in the case of Exhibition-road, they considered that the work was not a suitable undertaking to be put in hand for the relief of the unemployed. The Finance Committee submitted an estimate of 2,800*l.* in respect of the proposed work.

The Highways Committee's report stated that they were unable to find work for any more men as scavengers and road sweepers. After discussing the matter for nearly two hours the Council decided to agree to the recommendation of the Works Committee. This will mean that employment will be found at half-time for about 120 men.

COURT OF COMMON COUNCIL.

The usual fortnightly meeting of the Court was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

Tramways.—Alderman Sir J. Bell presented a petition, signed by over 3,000 ratepayers, asking the Corporation not to give their assent to the proposal of the London County Council to run tramways over Blackfriars Bridge and along the Victoria Embankment. There was also a petition from the Vestry of St. Anne's, Blackfriars, in favour of the scheme. Both petitions were referred to the Streets Committee.

The Streets Committee reported relative to the London County Council's application for the Corporation's assent to the tramways over Blackfriars Bridge, etc., and stated that they had adjourned the further consideration of the matter until after the first meeting in the New Year, in the hope that by that time the report of the Royal Commission on London Traffic would be in the hands of the Corporation.

Blackfriars Bridge.—Mr. Fortescue moved:—"That the Bridge House Estates Committee be instructed to consider the advisability of widening the north end of Blackfriars Bridge, so as to do away with the acute angle which now exists at its junction with the Thames Embankment, and thereby greatly facilitate the traffic at this dangerous point."—The motion was referred to the Streets Committee.

Fire Protection.—The Streets Committee reported having taken the necessary steps for the introduction of a Bill in the next session of Parliament empowering the Corporation to inspect all buildings and require owners to provide proper means of exit through the roof by fixed ladders and other methods of escape from fire.

Contracts.—It was agreed to accept a tender of Messrs. H. Greene & Sons, Ltd., for carpenters', plumbers', painters', smiths', and engineering jobbing works for three years from January 1 next at 17½ per cent. below schedule prices, and a further 5 per cent. discount for cash payments.

Building Act Amendment.—The following resolution, passed at a meeting of the Bartholomew Club, was submitted:—"That, in reference to the new Building Act Amendment Bill now being promoted by the London County Council, without consultation with the Corporation or the local and professional authorities, this meeting advises that the campaign adopted in the case of the London Building Act be agreed to, and that, if the Bill be pressed, the Lord Mayor be asked to call a public meeting of protest by the citizens at the Guildhall."—This was referred to the Streets Committee.

Underground Convenience.—In consequence of difficulties having arisen, the Streets Committee reported that they had abandoned the site in the Guildhall-yard, by St. Lawrence Jewry Church, for an underground convenience, and they recommended in lieu thereof that an underground convenience be constructed under Guildhall-buildings, opposite the City of London Court, at an estimated cost of 3,000*l.*—This was agreed to.

Duke's Head-passage.—The Improvements Committee reported again with reference to

the proposed widening and converting of Duke's Head-passage into a carriage-way, between Ivy-lane and Paternoster-row, and recommended that no further action be taken in the matter.—Mr. S. J. Sandle moved that the matter be referred back to the Committee for further consideration, and this was carried.

City Surveyorship.—The Court sat in private to consider the election of a City Surveyor from the following selected candidates:—Mr. Frederick Brown, Mr. James Leonard Crouch, Mr. Sydney Perks, Mr. William H. Prescott, Mr. Frank Sumner. The voting resulted in the selection of Mr. Sydney Perks, of 5, Crown-court, Cheapside, E.C., formerly assistant to the Surveyor to the Board of Trade, and who has been in private practice since 1890.

Illustrations.

A CHRISTMAS VISION: AFTER TENNYSON.



R. CONRADE'S drawing is the result of a commission from us to make an illustration of an imaginary picture described in Tennyson's "Palace of Art." He devotes a series of stanzas to describing, one after another—a stanza to each—various pictures in the fabled palace; and in the catalogue occurs this one—

"Or the maid-mother by a crucifix,
In tracts of pasture sunny-warm,
Beneath branch-work of costly sardonyx,
Sat smiling, babe in arm."

The "branch-work of sardonyx" evidently has a kind of Byzantine suggestion, which the artist has followed in the framing of the picture, though his Virgin is perhaps somewhat too naturalistic a figure for the surroundings. However, we have the "Madonna della Seggiola" as a precedent.

INTERIOR, ST. JAMES'S, PICCADILLY.

This drawing by Mr. Leslie Wilkinson, is the one which gained its author the Academy silver medal for perspective drawing, open to architectural students alone.

It is hardly necessary to say anything about this well-known church; but the drawing illustrates very well Wren's admirable way of working in the gallery (then considered a practical necessity) into a classic composition.

GRAMMAR SCHOOL, MARLBOROUGH.

The new grammar school at Marlborough, built from the designs of Messrs. Silcock & Reay, of Bath, is intended to accommodate eighty scholars, forty boys and forty girls. It is built on the site of the old grammar school, but set a little further back from the road.

There are two entrances, one for boys and one for girls, with cloakrooms, changing-rooms, and lavatories attached, and the building contains on the ground floor a central assembly-hall, with four classrooms and teachers' room opening out of it, and on the first floor four classrooms, a lecture-room, and a music-room. The physics laboratory and cookery-room are on the ground floor, and the chemical laboratory and the art-room are on the first floor. There are two playgrounds, with a playshed and a bicycle-shed in each, and with a manual instruction-room in the boys' playground.

The building is heated by hot water, and rooms ventilated by means of extraction flues and inlet-ventilators.

The builders are Messrs. Downing & Rudman, of Chippenham, and the clerk of the works is Mr. A. H. Davies.

HOLY TRINITY CHURCH, SOUTHPORT.

This is a re-building of an already existing church at Southport. The drawing shows the design of the west end, which shows a rich and effective treatment, the west window having two orders of tracery, one outer one standing in front of and partially veiling the actual window tracery. The western façade of the nave is treated as a panelled stone screen, the gable rising behind it.

The estimated cost is 10,000*l.* for the nave and aisles, 7,000*l.* for the tower and west end, and 3,000*l.* for the morning chapel and transept.

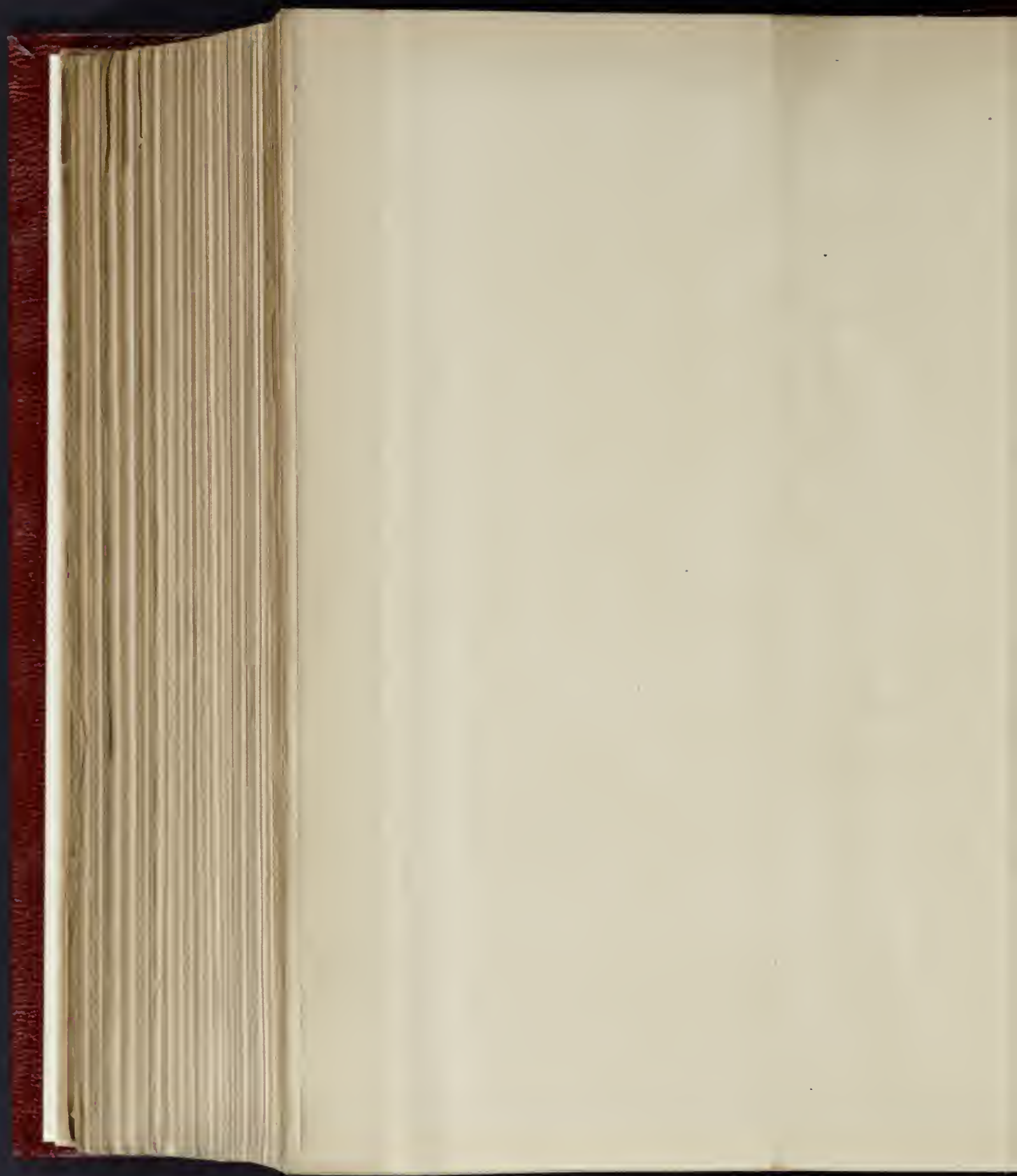
The materials used are Bath stone for exterior dressings, Runcorn stone for internal arcades, and Chorley bricks for the brickwork.

The builders are Messrs. J. C. & F. Woods, of Bolton and Southport, and the architects Messrs. Mearns & Simon, of Liverpool.



A CHRISTMAS VISION: AFTER TENNYSON—DRAWN BY MR. A. C. CONKADE

THE PHOTO-DUPLICATIONS OF THIS PICTURE WERE TAKEN BY THE PHOTO-DUPLICATION COMPANY, 10, SOUTH BROAD STREET, LONDON, E.C.



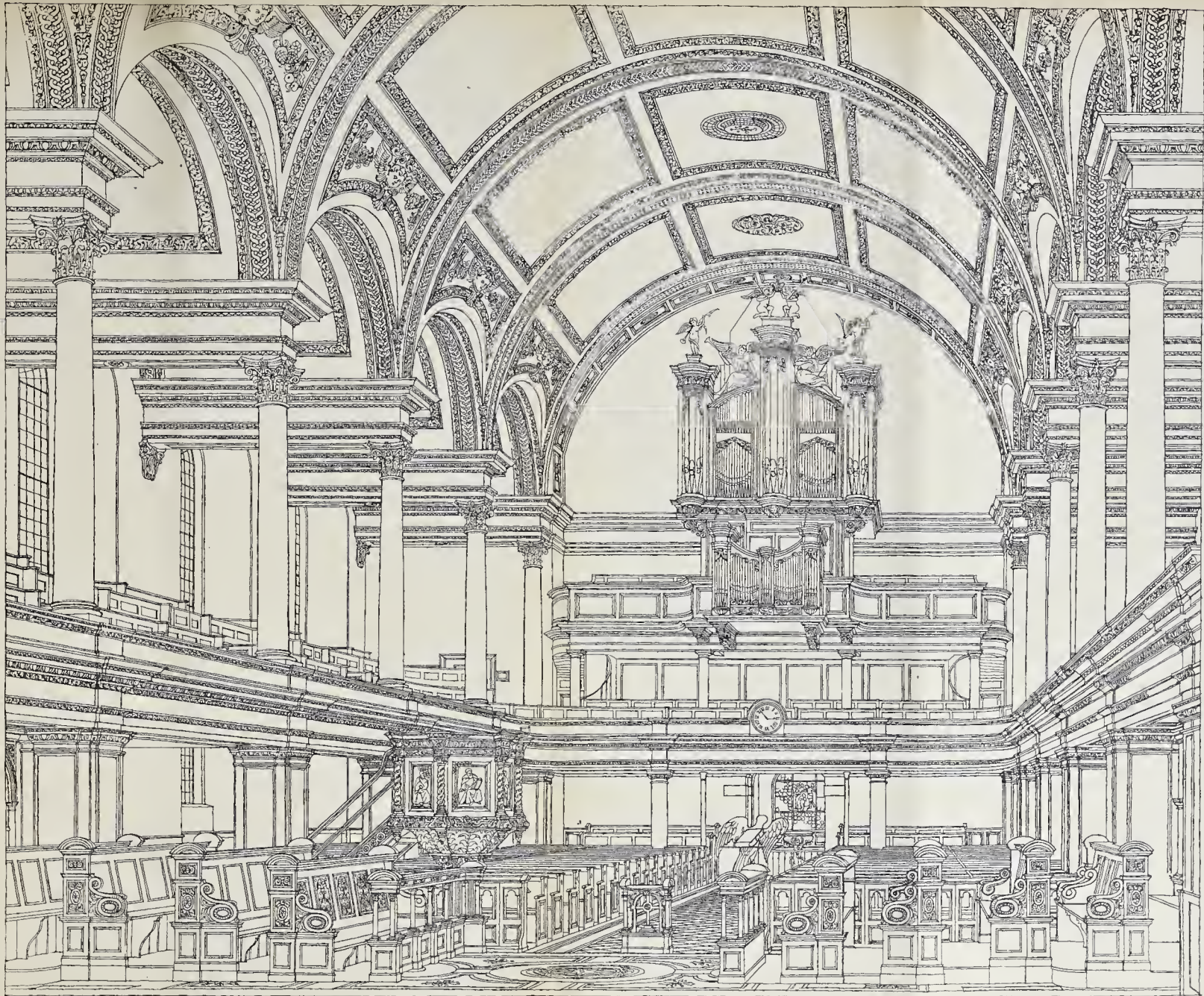
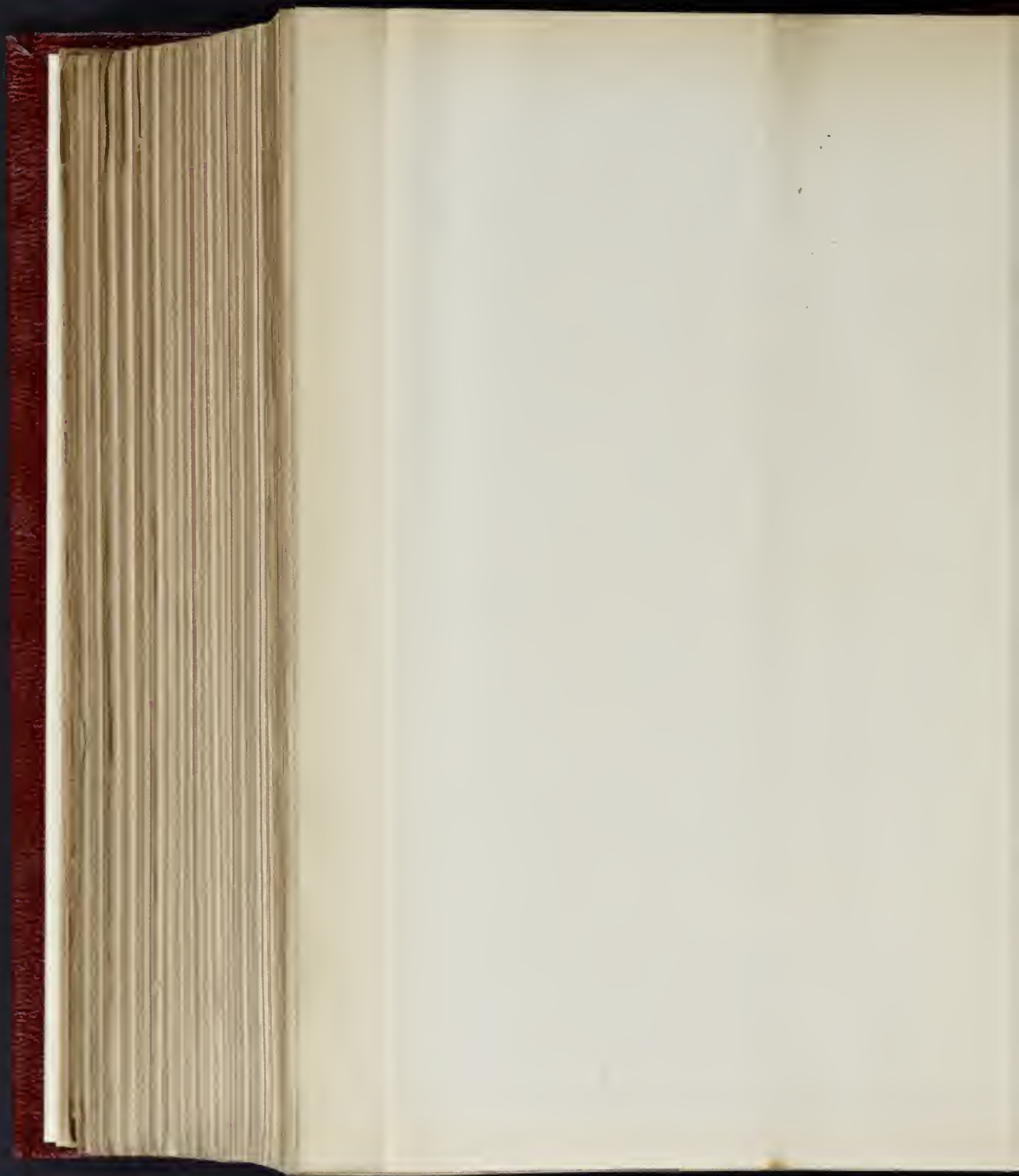


PHOTO LIND & GRAVE 40, 117, 433 EAST WARDING STREET PETER LANE E.C.

ST. JAMES'S CHURCH, PICCADILLY: PERSPECTIVE VIEW OF THE INTERIOR, LOOKING WEST
DRAWN BY MR. LESLIE WILKINSON.



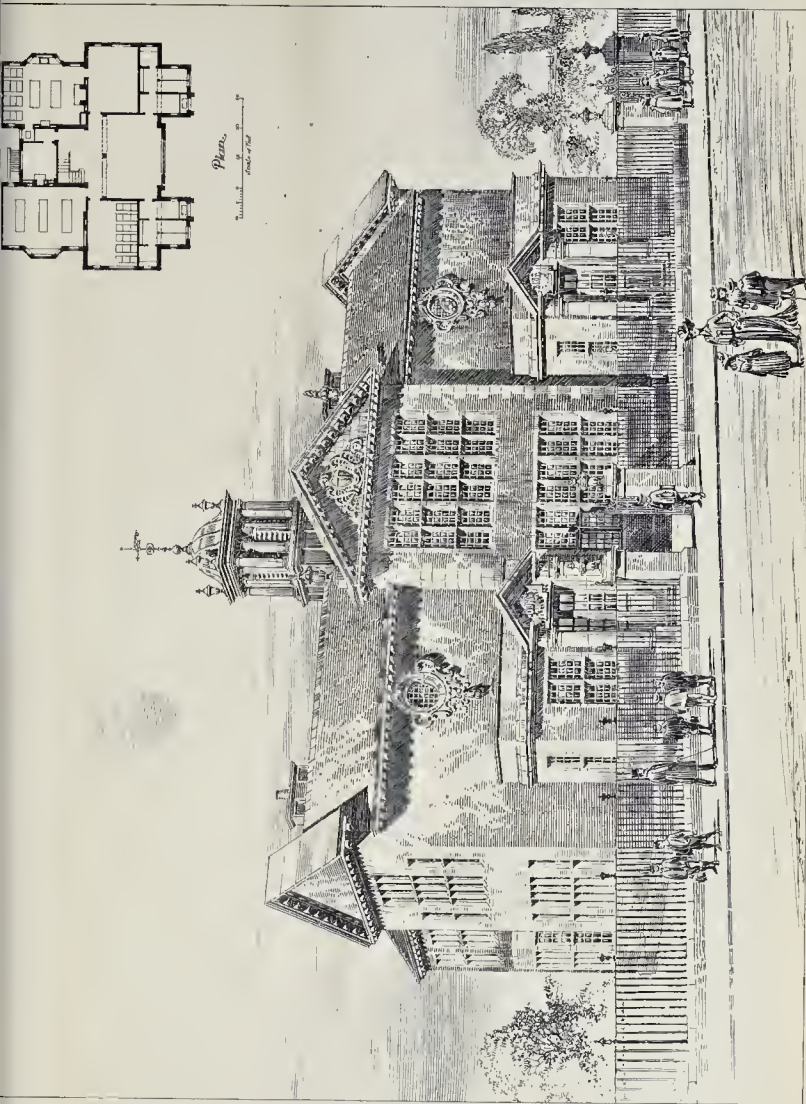


PHOTO BY THE ARCHITECTS

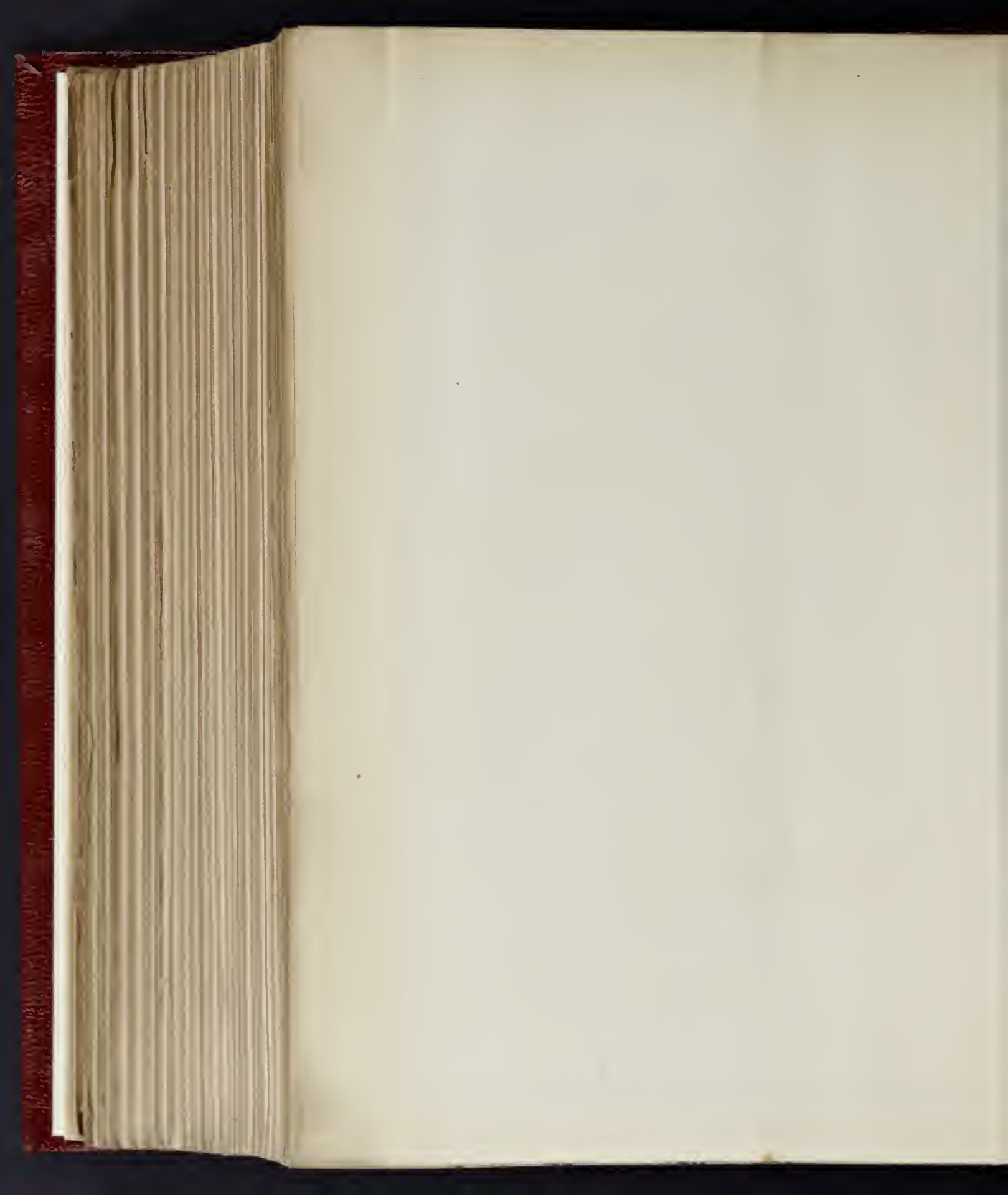
NEW GRAMMAR SCHOOL, MARLBOROUGH, WILTS.—Messrs. Silcock & Reay, Architects



REISA
DRAWN
DEL. 1904

PHOTO BY THE ARCHITECTS

HOLY TRINITY CHURCH, SOUTHPORT.—Messrs. Matear & Simon, Architects





NEW RECTORY, OXFORD, SURREY.

C. M. OLDRID SCOTT, ARCHT. 2, DEAN'S YARD, WASHINGTON.

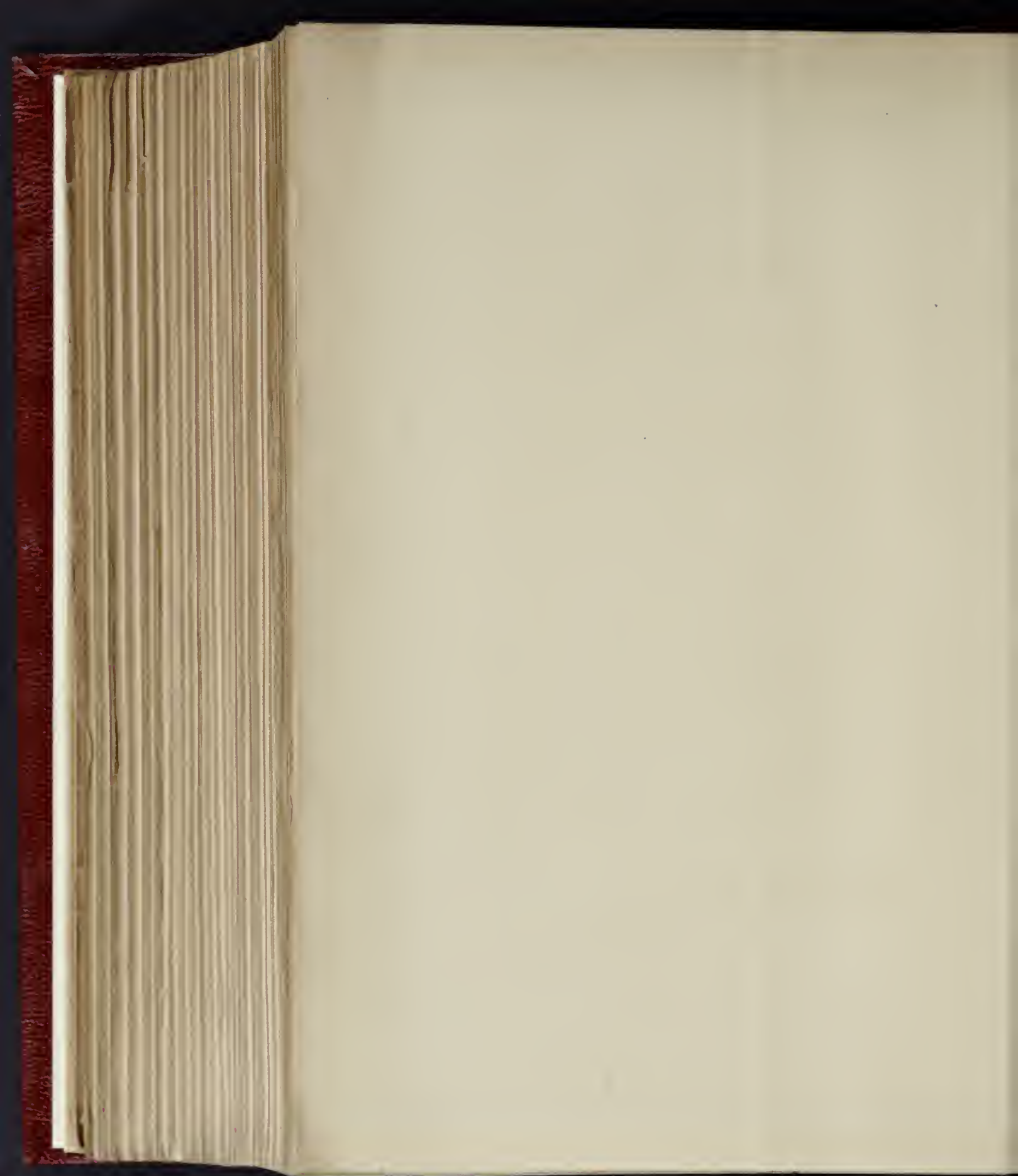
INK PHOTO SPRAGUE & CO. 114 4 & 5 EAST HADDON STREET FETTER LANE E.C.

THE BUILDER, DECEMBER 24, 1904.



INK PHOTO SPRAGUE & CO. 114 4 & 5 EAST HADDON STREET FETTER LANE E.C.

MEMORIAL GATE AT MONTON CHURCH, MANCHESTER.
MESSRS T. WORTHINGTON & SON, ARCHITECTS



NEW RECTORY, OXTED, SURREY.

The house is built of local stock bricks of a purple red, with red sand-faced bricks for dressings and quoins. The roof is of local red tiles.

A thick belt of trees shuts out both view and, to a great extent, sun on the south and east sides of the site, which is only one acre in extent, and therefore the dining and drawing-rooms were both given a westerly aspect, where there is a pretty view over Oxted village.

The cost of the house and boundary fences was 3,200l., Messrs. J. Brasier & Son being the contractors, and Mr. C. M. Oldrid Scott the architect.

MEMORIAL GATEWAY, MONTON CHURCH, NEAR MANCHESTER.

The boundary wall and gateway here illustrated were erected as a memorial.

They were executed in Darley Dale stone by Messrs. Deakin & Greenwood; the gates and railings were the work of Messrs. George Wragge, and the statue in the niche is by Mr. John Tweed, A.R.A.

The architects are Messrs. Thomas Worthington & Son, of Manchester, who also designed the church, with the schools and keeper's house.

COMPETITIONS.

MUNICIPAL BUILDINGS, BROMLEY.—The assessor in the competition for Bromley municipal buildings, Mr. J. S. Gibson, has now delivered his award, with the following result, viz.: First, Mr. R. Frank Atkinson, 8, Sackville-street, W.; second, Messrs. H. Ashley & Winton Newman, 10, Gray's Inn-square, W.C.; third, Mr. G. Harold Norton, 14, Bedford-row, W.C.; fourth, Messrs. Hall & Phillips, 6, Great James-street, Bedford Row, W.C.; fifth, Messrs. Lanchester & Rickards, 1, Vernon-place, Bloomsbury-square, W.C.

BOOKS RECEIVED.

JOHN N. RHODES—A YORKSHIRE PAINTER: 1803-1842. By W. H. Thorp. (Bemrose & Sons.)

SEA DEFENCE WORKS AT CLACTON-ON-SEA.—By their Bill, deposited for the next Parliamentary session, the Clacton-on-Sea Commissioners are seeking power to construct a sea wall in the parish of Great Clacton, with promenades or roadways for foot passengers. The estimated cost of the undertaking is 60,000l.

CRYSTAL PALACE ENGINEERING SCHOOL.—The award of certificates was made on Friday last week, at the close of the thirty-second year's work of the Crystal Palace Company's School of Practical Engineering. The chair was occupied by Mr. Charles Hawksley, Past-President of the Institution of Civil Engineers. From the reports of the Examiners, Mr. J. F. J. Reynolds, A.M.Inst.C.E., Mr. C. W. Sandish, A.M.Inst.C.E., and Mr. J. G. W. Aldridge, A.M.Inst.C.E., it appears that the general merit of work in the Mechanical, Civil, and Electrical Sections of the school has been fully maintained. The high percentage of marks—280 out of a possible 296—obtained by Mr. G. O. Sharpe, in the Lecture Examination on "Materials and their Manufacture," is deserving of special mention. Another noteworthy feature is the importance attained by the Electrical Section, whose continued growth testifies to the fact that absolute knowledge of electricity is now an adjunct essential to the well-trained engineer. The certificate of honour for six school certificates, none lower than third in order of merit, was secured by Mr. J. M. S. Culbertson, and the "Wilson" premium for a paper read before the Engineering Society on "Railway Practice and Construction in India," was awarded to Mr. L. H. C. Palmer. In the course of his address to the students, Mr. Hawksley expressed his regret that the present generation of engineers neglected the example of their predecessors, who combined utility with aesthetic design. The speaker had been so much struck with the ugliness of modern engineering works that he hoped to establish a premium in connexion with the Institution of Civil Engineers for designs combining good taste with utility and strength.—Other papers read during the session were "Water-boring in South Africa," by Mr. W. D. Cornwell; "Portland Cement," by Mr. N. G. Watson; and "Irrigation in India," by Mr. N. H. J. Daniell. Mr. S. Y. Knight (a former student), of the Llantwit Engineering Company, also read a paper upon "Railway Brakes."

Correspondence.

ARCHITECTS' DRAWINGS.

SIR,—It was with great satisfaction that I read your first article on the case of Ebdy v. McGowan which brings up the question of ownership of drawings so forcibly, and I am still more pleased that you are continuing the discussion and are proposing to do something practical to show how important it is to the profession, and indeed to artists similarly situated outside the profession. In response to your appeal, I shall be happy to add a cheque for five guineas to the one so promptly offered by "The Provincial Architect" and hope many others will do the same.

One of my earliest contentions—as a young architect—was on this very point, and I succeeded in proving my case to a large church building committee, advised by a very shrewd solicitor. My drawings were my tools, not to be handed to anyone else to do my work, but to be retained by me for future use if need be, at any rate, for my own purposes. I argued that I was not a draughtsman to make pretty drawings, but an architect to build buildings, with or without such tools as these drawings, models, or diagrams—according as circumstances required.

Since then (nearly half a century ago!) I have always stuck to the point and always succeeded, having never given up a drawing in my life under compulsion, and have found the use of my old drawings frequently—my clients often being glad to find I could produce what they themselves would have been sure to have lost, in the case of alterations, enlargements, drainage works, etc. I have always been glad to give drawings or copies which might be of use or importance, but never if demanded as a right, unless specially paid for.

C. F. HAYWARD.

SIR,—If the report of the case of Gibbon v. Pease, your clear exposition and criticism of the facts, and your powerful appeal to architects as a body are insufficient to disturb the lethargic, selfish isolation into which it is the habit of architects, whether as units or as corporate bodies, to plunge themselves, I do not flatter myself that anything I could say would be usefully supplementary.

Nevertheless, I may perhaps offer the following points for consideration:—

(1) To contest successfully the very important question of the ownership of architects' drawings and to bring out clearly all the factors in the case require not only plenty of "the spew of war," but, what is almost equally necessary, the evidence of "custom" as demonstrated by the pronounced and unmistakable anxiety of architects, individually and collectively, lest they should be deprived of the benefit and protection of such "custom." Consequently, I should like to see many far greater sums than my own 5l. 5s., and also many lesser amounts, subscribed to the fund you are good enough to open, so that it may be made quite apparent that from the man who can only afford 5s. to the one who would not miss 100l. the unanimous spirit and intention of architects is to preserve their rights and "custom" in this matter, whether by the law as it may, on appeal to the highest courts, be held to stand, or by the law as it may require to be amended so that justice and law may be, as regards architects, synonymous expressions. And it should be borne in mind that apparently even the measured drawings and sketches of student-days could be demanded by a client, under such an iniquitous *original claim* as that of Gibbon v. Pease, had the knowledge so gained been applied to the preparation of the drawings of a client's building.

(2) Architects as units (and as corporate bodies through their various societies) have, in the case of Gibbon v. Pease, an opportunity of obtaining an important legal decision, at a cost of a few pounds each, which would cost them many hundreds of pounds to strive to obtain individually, with probably, as merely an individual's action, less satisfactory results. And, further, the value of even one set of drawings, which under the decision in Gibbon v. Pease had to be surrendered, would be far in excess of the cost to each architect of the collective appeal against it which is proposed to be taken.

(3) Had action similar to that now contemplated in the case of Gibbon v. Pease been taken in the case of Ebdy v. McGowan, a great deal of subsequent hardship to architects, which has

been held justified under that decision of the law courts, would have been avoided, and probably the case of Gibbon v. Pease would never have arisen, and, had such a case arisen as Gibbon v. Pease, the difficulties of obtaining a reversal of the present decision in that case would not have been increased by the need of explaining away what will certainly be considered by lawyers an awkward "precedent," however much it may be repudiated by architects as being totally inapplicable to the case under review.

(4) Similarly, if means are not taken to reverse the present decision in Gibbon v. Pease, the next thing will probably be that clients ignorant of what architects really ought to be and of what architecture (worthy of the name) actually is will be led to suppose that every portion of a piece of architecture has been or should have been made the subject of elaborate sealed and full-sized drawings and of legally-phrased specifications and contract forms, and the next lawsuit to be anticipated by architects would probably be one for "negligence" or "legal fraud," because, perchance, some architect could not produce to his client on demand elaborate and painfully mechanical drawings and written descriptions of every moulding or scrap of carving connected with some building, or because some client with a taste for microscopical investigation had been able to detect that in execution of the work a departure from "studio designing" had been found by the architect to be more architecturally pleasing or desirable.

In fact, it only requires a very small expenditure of mental reflection for every architect to realise how very serious are the issues raised by the case of Gibbon v. Pease—for himself selfishly, and unselfishly for architecture, and to be fully convinced that it is in the interest of every single architect in England (in other countries, happily for them, the need does not exist, for in them architecture is better appraised at its true value) to prevent the abrogation of the "time-honoured custom" regarding the ownership by architects of their drawings and specifications.

(5) Lawyers delight in precedents. When, therefore, any one of them makes such absurd remarks as those respecting sculptors and sculpture to which you referred in your leading article of the 26th ult., he may perhaps be well referred to the practice which prevails in the more commercial world of gun-makers, engineers, and ship-builders. Let him inquire whether the purchaser of a piece of ordnance obtains with it all the experimental and completed drawings and specifications, all the calculations, particulars, and tests, and all the patterns, foundry-plant, and tools as well; or let him ask himself whether such firms as that of Armstrong or of Krupp would have even come into existence had every purchaser of a new form of gun been able to claim as part of the bargain and without payment the brains which, had the purchaser himself possessed them, would have rendered an Armstrong or a Krupp a superfluity. Let him also make similar inquiries amongst engineers and ship-builders, and say whether the results of such investigation were not similar. And then, whether he looks upon the practice of architecture as "an art or a profession," and whether or not the "registration of architects" (as of solicitors) be the one thing needed to establish the right of architects to treatment as fair as that which more "commercial" workers receive, it will not be difficult for him to gather quite a posse of precedents in support of that view of an architect's position, of his responsibilities to his client, and of his own rights and privileges which every architect has hitherto supposed to be so clear and obvious that even a lawyer, befogged as he may be by "case-law" and "precedent," ought not to fail to appreciate and to concede.

I beg to thank you as one architect for kindly undertaking to receive subscriptions towards the cost of the appeal, on behalf of architects generally, against the present decision in the case of Gibbon v. Pease, and to enclose my promised cheque for 5l. 5s. Should further monies be needed to carry the appeal to the highest courts or otherwise, I shall hope to be able then to make a further subscription, and I can only hope that, as in the case of Colls v. Home & Colonial Stores, Limited, a similar exhibition of courage and determination in the case of Gibbon v. Pease may effect as much needed a change in the legal estimation of architects and architecture as has taken place regarding the less human, though at one

time apparently, more hopeless, subject of "ancient lights."

A PROVINCIAL ARCHITECT.

Sir,—After the extremely energetic manner in which you have taken up the subject of the ownership of architects' drawings, I am very glad to find that you are further assisting matters by kindly offering to receive subscriptions towards the cost of an appeal.

Mr. Chorlton James, of the firm of Messrs. James & Morgan, of Cardiff, has very generously forwarded to me a cheque for 5*l.* 5*s.* towards the cost of this appeal, and I have forwarded this to the solicitors who have charge of the case.

This public spirited action on the part of Messrs. James & Morgan will, I hope, induce others in the provinces to also assist towards the necessary expenses.

The action which Mr. Pease is proposing to fight is of so much importance to the whole profession that every architect ought to make a point of sending a contribution, as undoubtedly the great cost should not bear unduly on the shoulders of any one individual when the case is being fought to maintain a principle.

The arguments you have brought forward both in the *Builder* and elsewhere have been so convincing that very little remains to be said.

To my mind architects above all others should know what it is they are selling when they receive their fees for professional assistance.

It seems almost as reasonable for an employer to insist upon having the plans—which are in fact the architect's working tools—as it would be for a customer to insist upon having the tailor's brown-paper patterns from which he cuts his cloth in making a suit of clothes.

I have much pleasure in herewith handing to you my cheque for 10*l.* 10*s.* towards the cost of the appeal.

GEORGE HUBBARD.

THE JOINERY TRADE.

Sir,—It would be interesting to know if "A London Builder" has tried to turn out work at the price and in such quantities as "A Shop Foreman" mentions. "A Shop Foreman," however, must not be too sure that the foreigner will raise the price of deals, etc., should joinery be taxed. The price of every article of commerce is regulated to a great extent by the supply and the demand, and, after getting as much as he can on "forward contracts," the foreigner consigns large quantities of timber to our London auction rooms to fetch what it will. On the other hand, should "A London Builder" get his 10 per cent. tax, he may find it hardly worth the candle. By the time the (say) doors are valued as low as possible for taxation, and numerous little dodges resorted to for the purpose of evading the same, it will probably work out at about 6*d.* or 9*d.* per door, a difference which can easily be made in the manufacture at home. "A London Builder" claims a "modern plant of machinery," but it can hardly be well managed, if his buying and joinery shops are. While a joiner is placed in charge of every joiner's shop in the country, anyone is considered competent to take charge of the machine work, instead of an experienced machine hand, and yet good results are expected. I know places where it costs more to grind a saw than it would do to buy

a new one, and they are often in hand too, yet the person in charge would be the first to point out his splendid system. This is only one point; but how can we expect to compete with foreigners on these lines? Wages and taxation are always to the front. Good management and enterprise seem to be secondary considerations. There are plenty of competent men to be found, some prepared to purchase an interest in a substantial firm, but—opportunity is a fine thing. I hope this discussion will be continued for our mutual benefit.

MILL FOREMAN.

NEW WESLEYAN METHODIST HALL COMPETITION.

Sir,—We have this week learned that the correct address of the last-named firm in the list of successful competitors published in your last issue is "Messrs. C. E. Mallows & A. W. S. Cross, London."

ALBERT CLAYTON.
* * The mistake of course was not ours. The names were sent to us, type-written, and we could only give them as sent.—En.

The Student's Column.

ASPHALT: ITS COMPOSITION AND PROPERTIES.—III.

ASPHALT MASTIC.

THE sample of balrinc asphalt rock referred to in our last chapter contains in its natural condition too much bitumen for "compressed asphalt," but approximately correct for "mastic," which is, however, usually made by boiling together rock asphalt containing about 10 per cent. of bitumen with a proportion of refined bitumen of suitable quality. After being thus heated to 400 deg. Fahr. and mixed mechanically in a boiler it is run into blocks of about $\frac{1}{2}$ cwt. It should contain 15 per cent. of total bitumen, be thoroughly homogeneous after stirring, and, unlike asphalt rock, should not fall to pieces on being heated. To obtain this homogeneity the rock must be ground very fine, the mixture with the bitumen amalgamated by fusion, or "cooking," in a thorough manner. For roadways it is usually laid in two thin layers, of a total thickness of 1 in., whereas the compressed kind is usually 2½ in. For footpaths, where the wear is not so great, grit (hard and clean) is added, 33 per cent. for temperate and 50 per cent. for tropical countries.

It is air, water, and vermin proof, is elastic to the tread, absorbs vibration, and is a non-conductor of electricity. It is unaffected by heat or cold—that is, the expansion and contraction which are caused by change of temperature do not produce cracks in the material. These properties make it very suitable for a damp-proof course because of its accommodation to any settlement of the building without break in the continuity of the protection, and because it need not be so thick as to squeeze out under the pressure of the superincumbent mass. Ordinary asphalt or mastic is not capable of resisting acids, because of the immediate effect of the latter upon the limestone contained as the base, but by mixing bitumen with pure silex an acid-resisting

mastic may be made and applied like ordinary mastic. This kind is used for electric accumulator rooms and baths for electrolysis, etc. Reference to the effect of petroleum spilt upon asphalt and of gas leaking under asphalt roadways will be made after more detailed reference has been made to the components of the "total bitumen" of Trinidad pitch and other bituminous substances.

Whilst the governing factor in asphalts (compressed or mastic) is the bituminous portion, yet the condition or size of the grains of the base (limestone) is not without effect. In Seyssel, Val de Travers, and Servas rocks the grain is fine, whilst in the Sicilian it is coarse, so that the specific gravity of the latter rock is less than that of the former.

Liquid asphalt, or asphalt mastic, footpaths of a $\frac{3}{4}$ in. layer weigh 80 lb. per sq. yd., equal to 143 lb. per cubic ft.

The use of bitumen is not confined to admixture with asphalt rock for the production of "mastic," but is used on its own account for watertight linings, for electric insulation, and the composition most suited for these several purposes must now be considered.

BITUMEN.

The several varieties of this substance are determined mainly by the proportions of the percentages of the more volatile constituents, but also in a less degree by the sulphur content. In this latter respect the nearly pure bitumen of Barbados is superior to that of Trinidad, being almost free from sulphur, whilst as much as 8 per cent. has been found in some samples from the last-named island. In both cases it is called manjak, and sometimes glance pitch, and is in appearance very much like Cannel coal, having a conchoidal fracture and being possessed of low elasticity. This makes it of service for use in making black varnish or for electrical insulation, but not for purposes where elasticity is of prime importance.

G. du Bois made a test of the best quality of Barbados manjak, and found 95.5 per cent. to be soluble in benzene, which is almost equal to carbon bisulphide as a solvent. Of the soluble matter, 63.63 per cent. was volatile on distillation and 32.27 per cent. of coke was left, whilst 4.10 per cent. consisted of impurities and earthy matters. Of the volatile constituents, 40 per cent. formed a good oil, suitable for the production of petroleum.

This purity in sulphur and ash makes the Barbados manjak valuable for coatings to prevent rusting of iron, or for varnish made by dissolving in turpentine, and is accordingly largely employed in the United States for the manufacture of Brunswick black and as an insulating material for electric cables; but for purposes where elasticity is needed it is by itself unsuitable, and where it is required to mix with natural rock asphalt its high melting-point is against it.

A sample recently tested at the Imperial Institute laboratory having the following percentage composition: Carbon, 81.18 per cent.; hydrogen, 8.43 per cent.; and oxygen, 10.39 per cent., melted at 327 deg. Fahr., whilst a sample of Trinidad manjak melted only at 428 deg. Fahr., because it contained only 12.6 per cent. of "petroleum."

TABLE II.

No. of Specimen	Natural Bitumens.			Natural Rock Asphalts.					9	Artificial Asphalts.		Old Asphaltic Pavements.		
	1	2	3	4	5	6	7	8		10	11	12	13	14
Description.	Natural Bitumens.			Natural Rock Asphalts.					—	Artificial Asphalts.		Old Asphaltic Pavements.		
	Crude Trinidad.	Cuban.	Egyptian, Imported from the Dead Sea.	Val de Travers.	Seyssel.	Turhalite, from U. S. Gulf, Texas.	Kentucky.	California Sandstone.		Carbanite, from West Virginia.	Petroleum residue from Santa Paula.		From Buffalo.	From New York Harbour.	Dubbi's Artificial Asphalt.
										Hard.	Soft.			
Water	2.03	0.30	—	—	—	—	—	0.33	—	—	—	—	—	0.43
Petroleum	32.45	25.46	35.09	8.52	7.49	8.79	3.35	11.32	49.96	64.57	63.50	4.39	6.67	66.79
Asphaltene	22.11	54.41	63.18	3.92	4.32	3.27	2.42	3.81	10.04	21.25	29.97	2.83	1.87	31.93
Other organic matter	8.12	2.47	1.73	25.79	—	—	—	1.12	—	13.71	6.09	4.10	3.70	1.28
Mineral matter	35.29	17.03	—	61.76	88.20	87.95	94.23	83.41	—	0.36	—	88.65	87.33	—
Total	100.00	99.78	100.0	99.99	100.01	100.01	100.0	99.90	100.0	99.99	99.56	99.97	100.0	100.0

NOTES.—Nos. 4 and 5 compared with Nos. 1 and 5 of Table I. show higher percentages of bitumen (total).

No. 6. A deposit consisting of a mass of sea-shells cemented by bitumen.

No. 9. A so-called asphaltum taken from a vein in Richlie county.

Nos. 10 and 11. Hard and soft artificial asphalts; petroleum distillation residues, California.

No. 12. From Franklin-avenue, Buffalo, N.Y. It was laid in 1878, in use for fifteen years. Made of Trinidad asphalt, wax tailings, and sand.

No. 13. From Governor's Island, age not known, but disintegrated by age.

No. 14. Made by adding sulphur to hot Lima petroleum tar.

For purposes where "accommodation" is an essential, as in water-tight linings, and where incorporation with natural asphalt requires an approximately similar melting-point, it is therefore necessary to have recourse to "Trinidad pitch" as the less oxidised and more tractable component.

Trinidad pitch is known also as "asphalt" and as "lake asphalt," from the extinct crater (in appearance like a lake), where the purest form is obtained; and this is sub-divided into liquid asphalt, semi-liquid asphalt, and solid asphalt; according to the consistency, which in turn is determined by the percentage composition of its petroleum-like components. The quality is also affected by the percentage of earthy matter that has gained admixture with the asphalt, and is greatest in "land asphalt," which is mined outside the crater referred to.

We have already mentioned the fact that means have been devised for differentiating the substances usually grouped under the term "bitumen," this having been found necessary in view of the great variety of natural rocks, natural pitches, and the introduction of petroleum and gas-tar pitches, or other analogous substances as substitutes.

Unfortunately no one method has as yet been found sufficient to ascertain these facts, and we have therefore to examine those most generally accepted for each feature, leaving out of our notice others which differ in details only.

The method devised by Peckham and Lynton is based upon a separation that originated with Boussingault, who found that bitumens yield to certain solvents a portion of their constituents to which he gave the name of "Petroleum," and to certain other solvents another portion which he called "Asphaltene." The first step in the process is to separate and estimate the water and then to digest the substance with petroleum spirit (sometimes called petroleum ether). The percentage weight of material removed by this solvent is called "Petroleum." To what remains undissolved boiling spirits of turpentine are added, and the digestion is continued for several hours, or as long as any coloured matter continues to be extracted. After this the process is repeated with chloroform in the place of turpentine, after which the matter still remaining insoluble is ignited and the residue weighed (with proper precautions) to determine the amount of organic matter and mineral matter respectively.

The table No. II. is given to act as a connecting link with Table I., and to show the components of West Indian and American products. The first section of Table III. has been compiled from the results obtained by S. F. Peckham, and recorded in the *American Journal of Science*, Vol. I., fourth series, the first six items by the officials of the Imperial Institute for the purpose of showing the varieties that exist in the district of La Brea. The value of the differential method has been confirmed by Mr. Clifford Richardson, who has made many tests of material and inspected the sites where the samples were taken, and his summary of Mr. Peckham's returns is also embodied in the third portion of the table.

He says: "These analyses, although carried out on somewhat different lines from mine, permit of the same conclusions in regard to the changes which have taken place in the land samples; and the additional determinations of bitumen made by Professor Peckham with chloroform furnish some additional and conclusive evidence of the differences between the two kinds of material."

"These show that the average 'land' specimen contains 2.4 per cent. more of its bitumen in the form soluble only with difficulty, while iron pitch, which is acknowledged to be of no value for paving purposes and is always rejected in digging land pitch, has 7.3 per cent. more of its bitumen in this form."

From this we can draw the inference that the land pitch collected by Professor Peckham is one-third converted into iron pitch and of so much less value than lake pitch for paving purposes. In fact, his results are as conclusive evidence of the difference between lake and land pitch as any that have been offered, and confirm the results of experience with the asphalt from the land deposits in the laying of street pavements."

The essential features of the investigations just referred to are embodied in sections I and 3 of Table III., and those of E. Donath and B. M. Margosches by a somewhat similar method in sections 2 and 4 of Table III.

Instead of using boiling spirits of turpentine and chloroform after petroleum spirit, the last-

named gentlemen employ benzene and carbon bisulphide. Notwithstanding this, the independent investigations prove quite confirmatory. They show that the bitumens in refined Trinidad pitch are practically identical with those of the standard rock asphalts, viz., that the "petroleum" is twice the percentage of "asphaltene," say 66 per cent. of the former, 33 per cent. of the latter, with about 1 per cent. extractable by the most searching solvents chloroform or bisulphide of carbon.

The table shows also the great improvement that takes place in the refining of the Trinidad pitch, mainly by removing the portion which is difficult to dissolve, viz., the chloroform, and incidentally shows that there is more of the improvement to be effected in the case of land pitch than in lake pitch.

The figures show also how much nearer the

petroleum pitch is to the natural bitumen than is coal tar pitch. This is not difficult to understand, seeing that the former is akin in origin and mode of formation and in the temperature of its distillation, whilst the latter is a product of high-temperature distillation in which a different order of carbon compounds, viz., the aromatic, is produced. The presence of these last named, such as anthracene, furnish a means for detecting the presence of coal-tar pitch.

The resemblance between petroleum pitch and Trinidad pitch is also in the percentage of organic matter undissolved, and means of differentiation of the components of this will be hereinafter mentioned. There is a difference in the mineral matter or inorganic residue in the separated bitumens, but as supplied commercially mixed with a base; this does not

TABLE III.—SECTION 1.

Specimen No.	Trinidad Pitches Tested by the Extracts.	Soluble in Petroleum Spirit.			Total called Asphaltene.	Total Bitumens.	Organic Matter Insoluble in Chloroform.	Inorganic Material.	Grand Total.
		A	B	C					
	Peckham's Method				B+C	A+B+C			
1	Lake pitch north-east	36 499	13 411	4 025	17 436	53 935	10 371	35 675	99 981
2	" " centre	35 950	12 310	5 762	18 072	54 025	10 732	35 192	99 999
3	" " west	34 290	13 575	7 222	20 797	52 067	11 357	35 645	99 999
4	" " south-east	35 362	9 862	4 800	14 662	50 924	11 212	38 762	99 098
5	Land pitch near lake	33 733	13 009	5 65	18 74	42 473	11 19	36 307	99 070
6	" " " village	33 619	10 69	7 235	17 925	51 544	11 615	36 832	99 994
7	Refined pitch	39 340	19 270	0 713	19 983	59 250	8 507	32 243	100 00
8	" "	38 485	21 705	1 133	22 838	61 323	7 460	31 217	100 00

SUNDRY ARTIFICIAL PITCHES TESTED BY THE EXTRACTS. E. DONATH'S METHOD. (SECTION 2.)

Specimen No.	Description	Petroleum Spirit.	Benzene.	Carbon Bisulphide.	Total called Asphaltene.	Total Bitumens.	Organic Matter Insoluble in Chloroform.	Inorganic Material.	Grand Total.
9	Sicilian asphalt	7 80	3 70	0 30	4 00	11 80	—	88 20	100 00
10	Bitumen from ditto	66 10	31 36	2 54	33 90	100 00	—	—	100 00
11	Petroleum pitch (soft)	68 50	23 50	1 50	30 00	98 50	1 50	—	100 00
10	" " (hard)	59 0	27 00	4 50	31 50	90 50	9 00 ?	—	99 50
12	Lignite tar pitch (soft)	81 30	15 50	0 70	16 20	97 50	2 60 ?	—	100 10
13	" " (hard)	11 90	86 50	0 30	86 80	98 70	1 80 ?	—	100 50
14	Coal tar pitch (soft)	25 05	44 98	6 57	51 55	76 00	22 67	0 15	99 42
15	" " (medium)	15 14	40 03	7 10	47 13	62 27	37 81	0 25	100 33
16	" " (hard)	15 51	39 86	1 21	55 07	70 58	29 19	0 20	99 77

SUMMARY SHOWING EXTRACTS AS ABOVE, AND THEIR PERCENTAGE OF THE TOTAL BITUMENS A + B + C.—(SECTION 3.)

Varieties of Trinidad Pitch compared with Sicilian Asphalt.	Percentage of Original Material.					Percentage of Bitumens.				
	A	B	C	B + C	A + B + C	A	B	A + B	C	
	17	Crude lake pitch average	35.2	12.4	5.2	17.6	52.8	66.8	23.3	90.1	9.9
18	" land "	33.3	11.9	6.5	18.4	51.7	64.7	23.0	87.7	12.3
19	" iron "	33.6	13.8	9.9	23.7	57.2	58.7	24.1	82.8	17.2
19	Refined pitch	39.34	19.27	0.713	19.983	59.25	66.41	32.42	98.83	1.17
8	" "	38.485	21.705	1.133	22.838	61.323	62.74	35.39	98.14	1.86
9	Sicilian asphalt	(See above).					66.10	31.36	97.46	2.54

TABLE III.—SECTION 4.

Specimen No.	Substance Tested.	Soluble matter in Percentages of the Total Bitumen.				Authority.	Ratio of the Extracts to each other.		
		Dis-solved by Petrol Spirit.	Boiling Spirits of Turpentine.	Sum of the two Extracts.	By Chloroform.		A + B	A + C	A - B + C
		A	B	A + B	C				
7 & 8	Refined Trinidad (average)	64.57	33.91	98.48	1.52	Peckham	1.90	42.4	1.82
9	Sicilian Asphalt	68.10	31.36	97.46	2.54	Donath	2.11	26.0	1.95
10	Petroleum Pitch (soft)	69.54	28.92	98.47	1.53	"	2.40	45.68	2.28
11	" " (hard)	65.19	29.84	95.03	4.97	"	2.19	13.1	1.87
12	Lignite Tar Pitch (soft)	83.38	15.90	99.28	0.72	"	5.25	116.1	5.02
13	" " (hard)	12.96	87.63	99.99	0.31	"	0.13	39.67	0.13
14	Coal Tar Pitch (soft)	32.79	58.72	91.42	8.57	"	0.56	3.81	0.49
15	" " (medium)	24.32	64.29	88.60	11.40	"	0.38	2.13	0.32
16	" " (hard)	21.98	56.48	78.46	21.54	"	0.40	1.02	0.28

afford a reliable method of discrimination. On account of these difficulties the extracts have been further examined by Dr. G. Lunge and V. Krepelka, whose recent researches are embodied in Table IV.

Before considering those results, it will be well to give the conclusions which Mr. E. Donath and Mr. Margosch have reached. After referring to the manner in which individual products may be distinguished by dry distillation, viz., wood-tar pitch, coal-tar pitch, lignite tar, petroleum, stearine, wool-tar pitches, and asphaltum, they go on to say that "natural asphaltum, when treated with alcoholic potash, colours the liquid only slightly at first, but more intensely after some time; lignite tar pitch colours the liquid immediately, and petroleum pitch gives either no coloration or an extremely weak one. The behaviour on successive extractions with petroleum spirit, benzene, and carbon bisulphide also affords a means of distinguishing between lignite tar pitch, petroleum pitch, and asphaltum. In the case of the last named, the insoluble residue consists entirely of inorganic mineral matter. In practice the most common form of adulteration is the addition of coal-tar pitch to natural asphaltum."

They recommend successive extraction as just mentioned, and if coal-tar pitch be present the residue will be black and will give a brownish red solution with concentrated nitric acid. The presence of anthracene and the production of a coloured fluorescent solution with methyl or ethyl alcohol or chloroform yield additional evidence of the presence of coal-tar pitch." Dr. Lunge states that petroleum spirit will give a precipitate with the chloroform solution of the tar pitches, but not with those of the natural asphaltums or petroleum asphalt.

"STUDENT'S COLUMN" PAPERS ON PORTLAND CEMENT.

We are deeply annoyed, for every reason, to have had evidence laid before us that the writer of the articles headed "Notes on Portland Cement," which appeared under the heading of "Student's Column" in the earlier pages of the present volume, has made a use of Mr. D. B. Butler's book on "Portland Cement" (published by Messrs. Spott in a manner which constitutes an infringement of copyright; as we find that many sentences have been transferred almost *verbatim* from Mr. Butler's book to our columns. Both author and publisher need hardly be told that we regret this, since it is in fact an even greater injury to us than to them. The writer of the articles, who was previously unknown to us, gave us what appeared to be satisfactory evidence as to his capability to deal with the subject, and we accepted his articles in good faith. He had never contributed to our columns before, and we need not say that he never will again.

OBITUARY.

SIR LOWTHIAN BELL.—By the death of Sir Isaac Lowthian Bell, at the age of nearly 89 years, the world has lost one more of the few remaining veterans who helped to build up the great engineering industries of Great Britain, and one who had acquired a world-wide reputation as a scientific and practical metallurgist. Born at Newcastle in February, 1816, Sir Lowthian Bell has for many years been one of the eminent men whom Tyne-siders delight to honour, and, although his more important work was performed on the banks of another river, he never forgot the city of his birth. After attending Mr. Bruce's school in Newcastle, he went to Germany and Denmark for further instruction, thereafter becoming a student at Edinburgh University, and the Sorbonne, Paris, and finally, at the age of 24, he joined the ironworks at Walker-on-Tyne, of which his father was part proprietor. In 1845, Mr. Bell succeeded to a portion of his father's interest, and at that date the firm were already smelting ironstone from the Yorkshire coast in a furnace designed by him for the purpose. The discovery of the Cleveland ironstone, at Eston, a place further inland, came as no surprise, and, about the year 1850, Mr. Bell and his two brothers at once threw themselves into the new enterprise suggested, and built the now celebrated ironworks at Port Clarence, on a site that was then a mere salt marsh on the north bank of the Tees. At about the same period Mr. Bell was also connected with the chemical works at Washington, North Durham, in association with Mr. H. L. Pattinson, F.R.S. He enlarged

these works very considerably, and installed extensive plant for the manufacture of oxychloride of lead, as well as one of the first plants in England for the production of aluminium by the Deville process. We cannot here attempt to trace the progress of the Clarence Ironworks, but one or two points may be mentioned for the purpose of indicating the capable methods characterising the subject of this memoir. The new venture, starting with three furnaces in 1854, soon had to face severe industrial depression, and the hostility of the Stockton and Darlington Railway. After a Parliamentary struggle Messrs. Bell Brothers succeeded in obtaining independent access to their mineral rights by the formation of the Cleveland Railway Company. Further sources of ore having been secured for insuring ample future supplies, the firm was instrumental in obtaining powers for an extension of the line to Loftus. Attention was next turned to the question of fuel, and three collieries were successively acquired.

In the meantime the number of furnaces had been increased from three to six, and in 1865, after an exhaustive examination into the theory of the combustion of fuel in the blast furnace, Mr. Bell satisfied himself as to the desirability of larger furnaces, and built two with a height of 80 ft., and a diameter of 16 ft. Step by step the old furnaces were replaced by others of the new type, and four additional furnaces were erected, raising the number to twelve, the output per furnace being raised from 150 tons to over 300 tons per week. Mr. Bell was one of the first to recognise the advantages to be derived from the utilisation of furnace gases for heating the air blast, and, in fact, he played an important part in connexion with all the improved metallurgical processes which were introduced in those days. At a later date, as Sir Lowthian Bell, he conducted a series of experiments, at a cost of between 30,000l. and 40,000l., which demonstrated the possibility of producing steel on a commercial basis from Cleveland iron. This development had the important effect of rendering unnecessary the importation of Spanish ores for steel making, and opened up new fields for the application of Middlesbrough steel. Besides being a far-seeing and competent business man and an expert metallurgist, Sir Lowthian was a scientific and practical chemist, and an able statistician. Moreover, he was always a student and an investigator, and ever ready to communicate the results of his researches for the benefit of the world. Many of his writings have been translated into French and German, and are justly regarded as classic works. To enumerate the papers he has contributed to various scientific societies would involve a lengthy catalogue. Some of them have been published in book form under the title, "The Chemical Phenomena of Iron Smelting," and another well-known work of his is a book on the "Principles of Iron and Steel Manufacture." In 1858, Sir Lowthian (then Mr.) Bell was elected a member of the Institution of Mechanical Engineers, of which he became President in 1884; in 1867 he joined the Institution of Civil Engineers as an associate, being transferred to the class of members in 1873. He was one of the original founders of the Iron and Steel Institute, formed in 1869, and occupied the position of President from 1873 to 1875. In 1875 he became a fellow of the Royal Society, and he was elected an honorary member of the American Philosophical Society. He was also a member of the Chemical Society, and received the first Bessmer gold medal, as well as George Stevenson, Howard, Telford, and other medals and awards in the course of his professional career. He was created a baronet in 1885, and received the degree of LL.D. in 1895 from Edinburgh University. Sir Lowthian Bell was twice Mayor of Newcastle, and was also a justice of the peace, deputy-lieutenant, and sheriff for the County of Durham, and for five years member of Parliament for Hartlepool.

MR. W. PROSSER.—The death took place, on the 12th inst., at Wandsworth Common, S.W., of Mr. William Prosser, for over twenty years clerk of works under Sir Geo. Gilbert Scott, and afterwards with Messrs. Ernest George & Peto, in connexion with Rousdon, Devonshire. Mr. Prosser had retired from work for the past thirteen years, and reached the advanced age of eighty years.

DEMOLITION OF A PORTSEA CHURCH.—Under the powers sought for in the Naval Works (Portsmouth Barracks Site) Bill, the site of Holy Trinity Church, Portsea, and of the vicarage house will be transferred to the Admiralty, who contemplate demolishing the church and vicarage and utilising the site for the erection of barracks. The ecclesiastical parish will be united with one or more contiguous parishes.

GENERAL BUILDING NEWS.

BIBLE CHRISTIAN CHURCH, HOVE.—A new Bible Christian church is being erected in Old Shoreham-road, Hove. The church, when completed, will measure 160 ft. by about 68 ft., and will have frontages to Old Shoreham-road, Montefiore-road, and to a new road which it is intended to construct. The church will seat 412 on the ground floor, including a choir of forty-two; provision will also be made for an end gallery to be added when the need arises. The plan of the church shows a nave with shallow transepts, chancel, and organ chamber, entrance vestibules, and a minister's vestry. There will also be a lecture hall to seat about 250, and beneath the lecture hall there will be eight classrooms, three of which will readily form into one room. A ladies' cloakroom and a kitchen are included in the scheme, and the building will be heated by the low-pressure hot-water system. The walls will be faced on the exterior with rubble flint work, with dressings of Bath stone and buff-coloured bricks, and the roofs will be covered with Brosley tiles. The windows are to be glazed mostly with tinted glass in leaded quarries. The architect is Mr. Edwin J. Hamilton, of Brighton, and the builders are Messrs. Hookley & Co., of Grantam and Brighton.

CONGREGATIONAL CHURCH, SANDGATE.—The foundation-stone has just been laid of the new Congregational church, Sandgate. The church is designed in the Gothic style, and is to be built of Kentish rag stone, with Wallis' patent stone dressings. The roof will be of open pitch-pine, fitted with Messrs. Shorland's Patent extract ventilator, and both church and schoolroom will be fitted with ventilating panels. The windows of the church are two-light, with circular light over, filled in with tinted leaded lights, and at the east end there will be a four-light tracery window. The flooring of the church, vestry, and schoolroom will be wood blocks, laid by the Westminster Flooring Company. The seating accommodation of the church will be 260, and the schoolroom, situated at the rear of the church, will hold seventy-five scholars. The building throughout will be heated by Messrs. Werner, Pfeleiderer, & Perkins' small horse system of heating. The contractor for the work is Mr. J. Brissenden, of Sandgate, and the architects are Messrs. Bowles & Hawkins, Dover.

CHURCH, STOCKTON.—The Bishop of Durham presided at a meeting, held at Stockton on the 12th inst., at which an appeal was made for funds towards the extension of Holy Trinity Church, Stockton. It was explained that the extension of the chancel for which the design of Mr. C. Errington, Newcastle, had been accepted, would cost about 1,400l., and the entire scheme nearly 3,000l.

NEWINGTON CHURCH, SITTINGBORNE.—The new work in connexion with the restoration of the fabric of this church was dedicated on the 16th inst. The church is a structure of various dates, the earliest part being the present vestry, which was built apparently as the lower part of a tower by Richard de Lucy, Lord Chancellor of England, between the years 1154 and 1178, in the reign of King Henry II. The stonework of the two lancet windows in this chamber was quite decayed, and has been replaced by new, and a new vestry doorway with oak door has been inserted. The other work consists of rebuilding the defective parts of buttresses and renewing such portions of the stonework of windows, string courses, etc., as were in an advanced state of decay, and restoring the west gable of the south aisle, which has been patched with modern brickwork. The whole of the work has been carried out by Mr. W. Parmenter, builder, of Braintree, Essex, under the superintendence of Messrs. James Brooks, Son, & Godsell, of London, who also restored the XVth century western tower about three years ago.

CLUB PREMISES, DOVER.—The enlarged premises of the Dover Institute were opened a short time ago. The work has been carried out by Messrs. R. & G. Brisley from plans drawn by Mr. F. G. Hayward.

SCHOOL, GRANTHAM.—New school buildings have been opened for the Governors of King's School, Grantam. The Governors appointed Mr. John Bilson, F.S.A., of Hull, as their architect, and, after consultation with him, they decided to erect a new school building next the Brook-street frontage, and new dormitories and accommodation for boarders next the Castle-gate frontage, and to remodel the kitchen offices. The new structure is two stories in height, and has four classrooms on each floor, approached by a wide corridor from the principal entrance in the centre of the Brook-street frontage, and from the two entrances from the playground. Of the ordinary classrooms, seven are planned to accommodate twenty boys each, and one thirty boys. The classrooms are fitted with single desks, and heated by ventilating firegrates.

This building also includes the rooms for science teaching. The physics laboratory, on the ground floor, is 36 ft. long by 24 ft. wide, and is fitted with working benches for twenty students, sinks, cupboards, and sliding blackboards. Above this is the chemistry laboratory, also 36 ft. long by 24 ft. wide, fitted with working benches for twenty-four students. The lecture-room, which adjoins the chemistry laboratory, is 25 ft. long by 24 ft. wide, with accommodation for forty students. The buildings are faced with Ancaster stone, and the roofs are covered with Colleyweston stone slates. Over the entrance doorway are the Royal Arms, with three shields below, displaying respectively the arms of Bishop Fox, of Corpus Christi College, Oxford, and of the town of Grantham. The extension of the boarding-house was commenced in February, 1903, and it has been occupied since the middle of this year. It comprises a new building next Castle-gate, with a return connected with the older dining-hall and dormitory. These buildings are partly of three and partly of two stories in height. On the ground floor is a large day-room, masters' sitting-rooms, studies, changing-rooms, and lavatory. On the first and second floors are three new dormitories providing additional accommodation for thirty boys, masters' bedrooms, bathrooms, etc. The school has been almost entirely retained.

NATIONAL BANK OF SCOTLAND.—An extension of the premises on the east side of Nicholas-lane, Lombard-street, is being built by Messrs. George Trollope & Sons and Colls & Sons from plans and designs made by Mr. J. Macvicar Anderson. The adjoining premises, now occupied by the National Bank, were taken over by them about thirty years ago from the Agra Bank.

PRESBYTERIAN CHURCH HALL, PELAW.—The memorial-stone of church buildings at Pelaw-on-Tyne has just been laid. The estimated total cost is 1573/. The architects are Messrs. Badenoch & Bruce, of Newcastle, and the contractor is Mr. Wm. Foster, of Pelaw. The hall is designed in a plain treatment of Early English work, the walls will be faced with red pressed Pelaw bricks, and finished with stone dressings. The length of the hall is 50 ft., and its width 36 ft., and it is divided into nave and aisles by cast-iron columns and arches, the nave being carried up above aisle roofs and having clerestory windows, and open timber roof. The aisles will be divided off by curtains into classrooms for Sunday school purposes. The entrance is at the west end, and gives access to framed and glazed inner porch. Behind the hall are classroom and vestry, and a corridor for exit. All the joiners' work will be in pitch-pine, stained and varnished. The floors throughout will be wood block laid on the herring-bone pattern on concrete, and the seating will be by chairs; the heating by low-pressure hot water, Messrs. Emley & Sons, Ltd., having secured the contract for this work.

PALACE THEATRE, GRIMSBY.—The new Palace Theatre and buffet, which is situate at the corner of Victoria-street and Corporation-road, Grimsby, has just been completed. Externally the buildings are principally of red Accrington bricks, with buff terra-cotta dressings. The elevation to Victoria-street is early Victorian in style, and the central feature is a triumphal archway, with a pediment, capped with cupola and flagstaff; this is flanked on either side by smaller octagonal turrets, with a terra-cotta gable in the centre supporting an allegorical figure representing "Music." Along the whole frontage to the theatre is placed an ornamental iron and glass verandah. The buffet adjoining is placed at the junction of Victoria-street and Corporation-road. There are eight exits provided from various parts of the house, and the building is to accommodate 2,000 persons. The theatre consists of a pit, orchestra stalls, grand circle, four private boxes, and a gallery. Retiring-rooms for ladies and gentlemen, together with promenades at the rear of the grand circle, etc., are provided. The main entrance is placed in the centre of the building in Victoria-street through a hall, with staircases right and left leading to the circle, the walls of which are lined with ornamental tile dado. The decorations are carried out in Louis XV. style, the principal colouring being cream and gold, relieved with turquoise-blue and rose tints. The whole of the theatre will be lighted by electricity. The stage is 60 ft. by 30 ft. Dressing-rooms and other apartments contiguous to the stage are arranged at the back thereof. The architects are Messrs. Owen & Ward, of Birmingham, and the general contract has been carried out by Messrs. Hewins & Goodhand, of Grimsby. The other sub-contractors engaged on the works are Messrs. Mallin & Co., of West Bromwich, who have executed the fibrous plaster work and decoration and the Uralite fireproof curtain to

stage. Messrs. Ludlow & Knight, of Birmingham, are the electricians.

ISOLATION HOSPITAL, NEAR CHESTERFIELD.—A new isolation hospital for the Chesterfield district was opened on the 7th inst. by the Mayoress of Chesterfield. The hospital, which is situated at Penmore, Hasland, has cost 9,400/, and it has been erected by a joint committee representing the Chesterfield Corporation and the Urban District Councils of Whittington, Newbold, and Brampton. It comprises five distinct blocks, standing about 20 yds. apart, on an extensive site, with a southern aspect, about 200 yds. from the Chesterfield and Mansfield main road. The administrative block is a three-story building, with accommodation for eight or nine nurses. The scarlet fever block provides sixteen beds, and the enteric fever block ten beds, and there is a third block, with four beds, for cases of diphtheria. There is a laundry for disinfecting clothing. In the upper story of the building for scarlet fever cases is a sun bath. It is a large room, the outer walls and roof of which are mainly composed of glass. In this room juvenile patients will be allowed to play when there is sunshine. On the ground floor of this block are wards which may be used for delicate cases or for private and paying patients. The block for diphtheria cases has two wards, with two beds in each ward. All the buildings are of plain brickwork, and the fever blocks are provided with glass verandahs on the south side. The convalescent patients are provided with a space in which to promenade. Mr. G. E. Bolshaw, of Southport, was the architect, and Mr. D. Brown, of Hasland, had the building contract.

NEW CHEMICAL LABORATORIES, GLASGOW UNIVERSITY.—The new chemical laboratories at Glasgow University are now almost ready for use. Although between 10,000/., and 12,000/., has been spent upon the structures alone, they are intended only for temporary occupation. The main purpose of their erection was the necessity for coping with the great increase in the number of students who have taken advantage of the chemical laboratory at Gilmorehill in recent years. The buildings were designed by Mr. J. J. Burnet, architect. Formerly, students of all grades worked in one laboratory, now, however, the juniors and the seniors have each their own buildings. These are almost side by side, and are connected by a covered passage or bridge. The senior work will be undertaken in a building of three stories—on the top floor being the physical laboratory, and on the middle floor the laboratory for the study of organic chemistry, while the metallurgical department is housed in the basement. The physical laboratory is a large apartment, fitted with all the latest appliances. Several smaller rooms are adjacent to the laboratory. These include a private research laboratory, a dark-room for photography, a workshop, and a small lecture hall of semi-circular shape. From the lecture desk the gallery for the accommodation of students rises at a precipitous angle almost to the ceiling. It is seated for 100 persons. On the second floor, leading off the lecture hall, there are a preparation-room for the lecturer, and a small private laboratory. The main hall for the study of organic chemistry, like that in use up to the present, is well arranged and splendidly appointed. The whole of the new departments are supplied with draught chambers, into which air is driven by two fans each of 1½ h.p. In addition to the organic laboratory there are on the second floor, rooms for gas analysis and microscopic work (with a dark-room for photo-micrography); also a combustion furnace-room, and a bomb-room—the latter so named because experiments involving slight explosions will be conducted there. The metallurgical department in the basement is a valuable addition to the equipment of the University. It includes a cellroom with accumulators, and a 50 h.p. cable, and a special room where the fan apparatus is placed. This apparatus is driven by electricity, and is set in operation by switches in the lecturer's office. Adjoining the fan chamber there is a furnace-room, which supplies hot water for the heating of the whole establishment. The junior laboratory has accommodation for seventy-six students. Surrounding it are a series of apartments for special branches of work.—*Glasgow Herald.*

NURSES' HOME, AIRDIE, N.B.—On the 15th inst. the nurses' home, erected at the corner of Clark-street and Motherwell-street, Airdrie, for the nurses of the Airdrie and District Nursing Association, was opened. Mr. J. Maurice Arthur was the architect.

NEW OFFICES, WESSOX FOUNDRY, DARLINGTON.—These buildings, recently completed from the designs of Mr. W. Hargreaves Bourne, architect, Darlington, are built of Huncote plastic red bricks. The corridors,

halls, staircase, etc., are covered with a dark-green tile dado 4 ft. high, and white tiles 5 ft. high in lavatories, above which the plaster is brought flush, and the floors are laid with black-and-white tiles by Messrs. Doulton & Co. All the ground floor rooms are laid in pitch-pine block flooring. The staircase is of Stuart's granolithic stone. A special feature of the design is the entrance waiting hall, with gallery running round on first floor, open to a domed ceiling light, filled in with coloured leading lights. The board-room has a ceiling in elliptical section to obtain extra height. The drawing-room is open to the apex of the roof, and ceiled to the underside of the rafters, the principals showing in the room. The whole of the internal fittings and fixtures have been supplied by the North of England School Furnishing Company, Darlington. The contractor was Mr. Frederick Shepherd, of York, his sub-contractors being Messrs. Lishman & Son, plumbers; Messrs. Robinson & Son, plasterers; and Messrs. Mossom & Son, painters; all of Darlington.

NORWICH AND LONDON ACCIDENT INSURANCE PREMISES.—The new head office, which the Norwich and London Accident Insurance Association are building in St. Giles-street, is being erected from the designs of Messrs. Skipper, architects, Norwich. Messrs. John Youngs & Son are the builders, while the stonework has been executed by Mr. E. W. Potter.

WORKHOUSE INFIRMARY, CHESTERFIELD.—Messrs. Benham & Sons ask us to mention that in this building, briefly described in our last issue, the whole of the cooking apparatus, laundry apparatus, and hot-water work was carried out by their firm.

PEOPLE'S PALACE, BELFAST.—A section of this building was recently opened. The structure stands on a site with frontages to Donegall-road, Utility-street, Felt-street, and Eureka-street, the main entrance facing Donegall-road. The architect for the work is Mr. W. J. W. Roome, the builders being Messrs. McLaughlin & Harvey. Messrs. Musgrave & Co. are responsible for the heating arrangements, and the plumbing work has been carried out by Mr. John Dowling.

CLUB PREMISES, MELTON MOWBRAY.—On the 15th inst. the Constitutional Club, which has been erected in Sherwood-street, Melton Mowbray, was opened by Lady Victoria Manners. The building is a two-story one, consisting of red bricks and stone dressings. It has been erected by Mr. C. Barnes, whose tender amounted to 1,740/., from plans prepared by Mr. E. Jewis.

SANITARY AND ENGINEERING NEWS.

THE UPPER PENN SEWAGE WORKS.—The present population of the district drained is 3,155. The works are, however, designed to deal with the sewage from a population of 3,500, and are so constructed as to be easily capable of extension should that become necessary at any future time. The area of the district is 1,995 acres; the area of the land purchased for sewage purification purposes is 2356 acres. The area sewered is a most straggling one, and has necessitated, in comparison with the population dealt with, a very great length of sewers. Altogether there have been about 25 miles of sewers laid, consisting of 6-in., 9-in., 12-in., and 15-in. earthenware and cast-iron pipes. The whole of these sewers gravitate into the receiving chamber at the entrance to the outfall works. From this chamber there are three outlets, one being the main 15-in. sewer to the tanks, which carries the ordinary dry-weather flow of sewage, and also any excess up to three times the dry-weather flow, this being the maximum quantity which will be dealt with through the bacteriological tanks and filters. Any excess over this quantity, from three times up to six times the dry-weather flow, will be conveyed to the high-level portion of the land through a separate 12-in. stoneware and half-pipe carrier, and will be treated over an area of about 9 acres. The third outlet from the receiving chamber is a 9-in. pipe leading direct to the brook, and this is so arranged that in time of flood any excess over six times the ordinary flow of sewage will be carried direct to the brook. The sewage, before flowing into the tanks, passes through two detritus and screening chambers, for the purpose of arresting road detritus, flocculent matter, etc. From these chambers the sewage flows by means of submerged inlets into the covered bacteriological tanks. These are two in number, and are each 80 ft. long by 17 ft. 6 in. wide, with an average depth of six feet. The total capacity of the two tanks is 105,000 gallons, which is equal to one day's flow of sewage from a population of 3,500 people at 30 gallons per head. During its passage through the tanks, the sewage is broken down and

liquefied by bacterial agency, and prepared for treatment on the filter beds. The tank effluent passes off by means of submerged outlets, and is conveyed to a measuring chamber centrally situated with regard to the three circular filters. From the measuring chamber the tank effluent will be discharged automatically at intervals of from twenty minutes to half an hour, varying with the flow of sewage, through patent revolving spreaders on to the surface of the filter beds.

These spreaders are so designed that an equal dose per square yard of filter area will be given at each application. With the ordinary flow of sewage the tank effluent will be discharged on to the filters at the rate of 60 gallons per square yard per twenty-four hours. With the maximum amount of three times the ordinary flow the rate will be 180 gallons per square yard per twenty-four hours. The three percolating filters are circular in plan, and each 73 ft. in diameter. The filtering material is local gravel, varying in size from about 2½ in. to 1 in. The sewage after percolating through the filters is collected by means of aerating effluent channels, and conveyed into carriers round the outside of each filter, from which it is conveyed on to the lower portions of the land, over which it will be finally irrigated before being allowed to pass into the brook. Half-pipe distributing carriers are to be constructed for the purpose of distributing storm water, or raw sewage if desired, over the land, and the land will be under-drained with open-jointed, socketed pipes. The whole of these under-pipes will gravitate to an effluent discharge chamber, to be constructed at the lower corner of the field, from which the effluent will pass to the brook. The estimated cost of the whole of the works described was 14,000. The Rural District Council, however, were fortunate in letting the contract at a very favourable time, which not only enabled the carrying out of the contract, but also various additional works, without exceeding the estimate. Messrs. R. E. W. Berrington & Son are the engineers.

WATER SUPPLY, PORTPATRICK, N.B.—The new water and drainage scheme at Portpatrick is now nearing completion. Mr. W. Robertson Copland, C.E., Glasgow, was appointed engineer for the scheme, and in December, 1902, the District Committee of the County Council decided to proceed with it. Four acres of ground were secured at Enoch, two miles from the town, and 340 ft. above sea-level. Messrs. T. Forgan & Son, Perth, were the contractors, their tender being about 7,000. Early last year the work was commenced under the direct supervision of Mr. William Forgan, C.E., Perth, for the contractors, and Mr. Robert Millar, Mauchline, inspector of works, for the engineer. The reservoir at Enoch has a storage of 8,000,000 gallons, and the filtered supply in the clear-water tank is 35,000 gallons. In all about three and a half miles of water pipes have been laid. For the sewage, over two miles of pipes have been laid in the town area, the sewage discharging into the sea at Culvert Bay, on the north side of the town.

VENTILATION OF SEWERS.—On Monday the Public Health Committee of Kensington Borough Council reported having had under consideration a letter from the Lewisham Borough Council forwarding copy of a report of the Borough Surveyor adopted by them with regard to the ventilation of sewers, in which an opinion is expressed that the best means of remedying nuisances of smells emanating from surface road ventilators would be to require such ventilators to be placed much closer together than at present, and that steps should be taken with a view to the repeal of the London County Council Drainage By-law, made on October 30, 1900, under section 202 of the Metropolitan Management Act, 1855, which requires the trapping of drains, and asking co-operation in approaching the London County Council with the object of obtaining the repeal of the by-law referred to. The report of the Kensington Committee proceeded as follows:—

The efficient ventilation of the sewers of the metropolis being a matter of such supreme importance and urgent necessity, we consider the question can only be satisfactorily dealt with by united action on the part of all the authorities concerned; and with a view to a solution of the difficulty we consider that the London County Council should be invited to convene a conference with the Metropolitan Borough Councils, in order that a comprehensive scheme on scientific lines could be formulated. We much deprecate any such makeshift action as the substitution of existing road gratings, the nuisance from which is, in our experience, continually on the increase. We are of opinion that the suggested omission of the intercepting syphon, and where the main drain passes under or through residential or business premises (which is very largely the case in Kensington), be exposing the inhabitants and workers to grave risks, without any appreciable alleviation of the evil complained of; and we strongly deprecate any inter-

ference with the recognised standard of domestic sanitation as set up by the London County Council in their by-laws.

The London County Council are to be asked by the Kensington authorities to convene a conference to consider the best means of ventilating the sewers throughout the metropolis.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The executors of the late Mr. Richard Hardy, C.E., brewers' and maltsters' architect, Nottingham, have entered into agreement with Mr. A. Miller Baily, architect, brewers' and maltsters' consulting engineer, 9, St. Peter's-gate, Nottingham, whereby the two practices will in future be carried on by Mr. Baily, under the style of "Hardy & Baily," Bentinck Buildings, Nottingham. Mr. Baily was for ten years managing chief assistant to the late Mr. Hardy.

PROPOSED NEW WATERWORKS, BUGLE.—An inquiry was recently held at Steneales by Colonel A. G. Durnford, R.E., Local Government Board Inspector, on the application of the St. Austell Rural District Council for sanction to borrow 2,300l. for works of water supply for Bugle and Steneales, including the construction of a reservoir, with a capacity of 173,000 gallons, at Steneales. Mr. H. S. Hancock, engineer, is responsible for the scheme.

THE MARSHES, WALTHAMSTOW AND LEYTON.—Six acres of common land in the marshes are marked for appropriation by the promoters of a Bill for the construction, upon the "tube" system, of an electrical railway from Bridge-road, Hammersmith, by way of Piccadilly, Gracechurch-street, Stoke Newington, and Palmer's-green, to Walthamstow.

THE SANITARY EXAMINERS.—At an examination in Practical Sanitary Science held in London, December 9 and 10, nineteen candidates presented themselves. The following six candidates were awarded a certificate:—A. J. Catley, Reading; Lahnolot A. Cooper, West Ealing; James Ewing, Lloyd-street, W.C.; E. Bertram Hartfree, Camberley; A. E. Powell, Stoke Newington; and G. H. Stevenson, Shipnal.

CEMENT PRODUCTION IN THE UNITED STATES.—From a report recently issued by the Department of the Interior at Washington it appears that the total production of hydraulic cement in the United States in 1903 was 29,839,140 barrels, valued at 31,931,340 dol., as compared with 25,753,504 barrels, valued at 25,366,380 dol., produced in 1902. Of the total production in 1903, 22,342,973 barrels, having a value of 27,715,319 dol., were Portland cement. The production of natural rock cement was 7,030,271 barrels, valued at 3,675,520 dol. The production of Pozzolano, or slag cement, was 525,896 barrels, valued at 542,502 dol. The increased production of Portland cement in 1903 resulted in a glutted market, which made the artificial product so low in price in the eastern part of the country as to interfere seriously with the production of natural rock cement. Many of the plants whose output is exclusively the natural cement were, for this reason, shut down during a large part of the year.

SHEFFIELD MASTERS' ASSOCIATION.—The usual monthly meeting of this Association was held at the Builders' Exchange on Thursday evening last week, Mr. J. D. Cook, President, occupied the chair. In addition to the usual business of the monthly meeting, there was the investiture of the President with a new gold chain and medallion, as a badge of office. This ceremony was performed by Mr. A. J. Forsdike, who briefly stated the origin of the idea of obtaining this presidential badge, and referred to the able, energetic, and whole-hearted way in which Mr. Cook had carried out the duties of President. Councillor Longden and Mr. J. Biggin also joined in the congratulations to the President. Mr. Cook, in reply, thanked Mr. Forsdike for the kind words he had expressed, and compared the position and status of the Association at the present day with what it was years ago, and said he felt that, great as had been the improvement, there was still work to be done, and he hoped that the future presidents would be encouraged to use every effort to further the work of the Association. The badge, which consists of gold links, bearing the names of past presidents, with a button representing the York Rose between each link, and a pendant with the Sheffield coat of arms, and bearing the name of the Association, is the work of Messrs. W. & H. Ashken. Another feature of the meeting was the presentation, by Mr. Arthur Mastin, of a large framed portrait of his father, the late Mr. Joseph Mastin. A vote of thanks was accorded to Mr. Mastin for the gift.

CHURCH BUILDING SOCIETY.—The incorporated Society for Promoting the Enlarge-

ment, Building, and Repairing of Churches and Chapels, held its usual monthly meeting on the 15th inst. at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building a new church at Nether-ton, All Souls, near Maryport, Cumberland, 140l., in lieu of a former grant of 100l.; rebuilding the churches at Forton, St. John, near Gosport, Hants, 250l., in lieu of a former grant of 200l.; and Highweek, St. Mary, near Newton Abbot, 85l.; and towards enlarging or otherwise improving the accommodation in the churches at Clevee Prior, St. Andrew, near Evesham, 30l.; Newington, St. Mary, Kent, 10l.; Oxenton, St. John the Baptist, near Cheltenham, 15l.; and Feckenham, St. John the Baptist, near Redditch, 30l., in lieu of a former grant of 20l. Grants were also made from the special Mission Buildings Fund towards building mission churches at Tunstall, St. Chad, Staffs., 30l.; and Woodland, St. Mary, near Butter Knowle, Co. Durham, 15l. The following grants were also paid for works completed:—Lydbrook, The Holy Jesus, near Ross, 15l.; Hither Green, St. Swithin, Kent, 50l., making in all 150l.; Great Sturton, All Saints, near Horncastle, 15l.; and Broadheath, Christ Church, near Worcester, 80l. In addition to this, the sum of 125l. was paid towards the repairs of ten churches from trust funds held by the Society.

PROPOSED NEW TOWN HALL AND MARKET, DARTMOUTH.—Mr. Edmund Pearse, Inspector of the Local Government Board, held an inquiry at Dartmouth recently into an application of the Town Council for a Provisional Order under section 303 of the Public Health Act, 1875, to enable the Corporation to provide a new market house, town hall, and municipal offices. The Town Clerk said the present market house was in a very old and dilapidated condition, and the Council, therefore, desired to demolish the existing building, and to substitute an entirely new structure comprising a market house, with modern stalls, accommodation and conveniences, and a town hall, with municipal offices. To enable that scheme to be carried out it would be necessary to provide a sum of money estimated approximately at 7,000l. Mr. Smith, the Borough Surveyor, having given evidence, the inquiry closed.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—Employment in the building trades continued dull during November, and was rather worse than in October. It was much worse than a year ago. Employment with carpenters and joiners was bad generally, and worse than a month ago and a year ago. The percentage of unemployed trade union carpenters and joiners was 10·1 at the end of November, compared with 8·3 at the end of October, and 6·1 at the end of November, 1903. With plumbers it was bad in England and Ireland, and worse than a month ago and a year ago. In Scotland it was moderate, rather better than a month ago, but worse than a year ago. The percentage of unemployed trade union plumbers was 10·2 at the end of November, compared with 9·1 at the end of October, and 7·2 at the end of November, 1903. With bricklayers employment generally was dull, and about the same as a month ago, but worse than a year ago. With masons it was moderate in England, and worse than a month ago, but about the same as a year ago; in Scotland it was very dull, and worse than a month ago, but somewhat better than a year ago. With painters employment continued bad generally, and was worse than a year ago. Employment with plasterers was very slack, and worse than a year ago. With slaters and tilers employment was dull generally, being about the same as last month, but rather worse than a year ago. With builders' labourers employment was bad, and worse than either a month or a year ago. The returns received from seventy employers' associations show that employment generally was dull, and worse than a month and a year ago.—*Labour Gazette.*

Legal.

THE CHALEY RURAL DISTRICT COUNCIL v. SIR W. CRANTHAM.

THE case of the Chaley Rural District Council v. Sir W. Crantham came before the Lewes Bench on Thursday morning, when the magistrates gave their decision. The chairman said the Bench found that defendant had sufficiently complied with certain of the by-laws, but that he had not sufficiently complied

with others. At the same time it seemed to them that defendant's plans were intended by him to indicate that the buildings he proposed to erect would conform to the requirements, and if he had failed in some particulars it had been due to misapprehension for which he was not wholly responsible. In the circumstances of the case, therefore, the Bench hoped it would not be necessary for them to give a more definite decision.

Mr. Grantham asked that upon the finding the summons issued under by-laws 45 and 46 be dismissed.

The Chairman: It is not a decision. We call it a finding, and we do not comply with your request.

Mr. Crauthan said that after the intimation now given it might be necessary for Sir William's advisers to consider what steps had best be taken to compel the Rural District Council to adopt the arbitration decision of the Local Government Board, and to move the High Court on other grounds. He presumed there was no chance of the Bench coming to a decision.

The Chairman: If pressed we might come to a decision, but we hope it will not be necessary.

Mr. Grantham: Defendant wishes counsel to say he cannot be a party to any compromise on the evidence.

The Chairman: The Bench hope to hear nothing more of the case, and that the parties will be able to come together and proceed amicably.

CASE UNDER THE LONDON BUILDING ACT, 1894.

THE case of the *King v. Kettle* and the London County Council (*ex parte James Ellis*) came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Kennedy and Ridley, on the 19th inst., for argument on a *rule nisi*, calling upon Mr. Kettle, the magistrate sitting at the Woolwich Police Court, and the London County Council to show cause why the magistrate should not deliver to Mr. Ellis, the applicant, a case, stated and signed by the magistrate, between the applicant and the London County Council. The facts were shortly as follows:—The applicant was summoned in August, 1903, by the London County Council for erecting a building in Cedar-grove, Charlton, beyond the general line of buildings contrary to the provisions of the London Building Act, 1894, and he was ordered to pull down a portion of the building, and was fined 40s. The applicant then asked the magistrate to state a case for the opinion of the High Court, but the magistrate declined. In August, 1903, the applicant told the magistrate that he wished to enter into a recognisance, and the magistrate told him that he should require a recognisance by himself and a surety in 50l., and these recognisances were taken. On August 20, 1903, the applicant obtained a *rule nisi*, calling upon the magistrate to show cause why he should not be called upon to state a case, and in the following December the rule was made absolute. In September, 1903, the surety died, and the following month the applicant was made a bankrupt. When the order of December, 1903, was served on the magistrate, he held that fresh recognisances were necessary, and he declined to deliver the case, which had then been stated and signed, before fresh recognisances were entered into, but he offered to deliver the case on a fresh recognisance in 50l. being entered into. The applicant then obtained the present rule.

Mr. Daldy appeared to show cause against the rule, and Mr. Frank Gover supported it.

In the result their lordships held that the magistrate, in the circumstances of the case, was wrong in refusing to deliver up the case without further security, and the rule was accordingly made absolute, with costs, against the London County Council.

CASE UNDER THE PUBLIC HEALTH ACT, 1875.

THE case of the Redruth Brewery Company v. the Redruth Urban District Council, on the 20th inst., was decided in a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Kennedy and Ridley.

This was an appeal by the Brewery Company against a conviction by the magistrates under the Public Health Act, 1875, the magistrates having stated a special case for the opinion of the Court.

Mr. Clavell Salter, K.C., and Mr. Soper appeared for the appellants, and Mr. Foote, K.C., and Mr. Turrell for the defendants.

Mr. Clavell Salter said this was a case stated by the magistrates, and it raised the question whether certain works done upon a building in Redruth brought that building within one

or other of the clauses created by the Public Health Act, in relation to which the work done upon an old building was to be considered as the erection of a new building. The facts were shortly these:—The houses in question were situated in the main street at Redruth, and they consisted, before they were touched at all, of a beerhouse, with dwelling-house over and behind, and next door a hairdressers, also with living-rooms. The property belonged to the Brewery Company, and the Brewery Company were desirous, in the first instance, of pulling the property down and building new houses. They accordingly sent in plans to the defendants. The defendants, as the local authority, declined to pass those plans unless the Brewery Company would agree to set back their frontage and facilitate the street widening. The Brewery Company and the local authority could not come to terms, and therefore the Brewery Company elected to do some alterations instead. They proceeded with these alterations, and thereupon the local authority came down upon them and took these proceedings against them, and alleged that the Brewery Company were making a new building. The houses were built before 1849, so *prima facie*, the by-laws did not affect these houses at all. The local authority had to satisfy the Court that they were not dealing with old houses, but new ones, and this they had done.

The Lord Chief Justice: Do you say if you take down half of your wall and put up a new half, and then remove the other half and put up another new half, leaving the roof as it was on the old building, you would not be putting up a new building?

Mr. Salter: I submit no, because the old roof remains.

After hearing further argument, the Lord Chief Justice, without calling upon counsel for the respondents, in giving judgment, said he did not think the Court ought to interfere in this case, as it was stated. Where people did things to old houses they must take the consequences if it brought them within the purview of the Act. He came to the conclusion that the finding was one of fact, and that on the law there was no other evidence to come to a different conclusion than that the magistrates had.

Justices Kennedy and Ridley concurring, the appeal was accordingly dismissed.

ACTION ANCIENT LIGHT DISPUTE:

MANDATORY INJUNCTION DISCHARGED.

IN the Court of Appeal, composed of Lords Justices Vaughan Williams, Romer, and Cozens-Hardy, last week, the hearing was concluded of the case of *Kine v. Jolly*, on the defendant's appeal from a judgment of Mr. Justice Kekewich, in the Chancery Division.

(The case was reported in the issues of the *Builder* of July 23 and 30, August 6, and December 17, 1904, and the facts of the case have been sufficiently stated.)

Mr. Hughes, K.C., and Mr. Vernon appeared for the appellant, and Mr. P. O. Lawrence, K.C., and Mr. Cann for the respondent.

Mr. Hughes, in replying on behalf of the appellant, contended that, on the findings of fact of Mr. Justice Kekewich, the plaintiff had failed to prove that the defendant had committed a nuisance, and, therefore, the action should be dismissed.

During the course of the arguments their lordships stated that they would accept the findings of fact of Mr. Justice Kekewich.

Lord Justice Vaughan Williams, in giving judgment, said that the question what tests ought to be applied in actions brought for obstruction of ancient lights, so as to ascertain whether a plaintiff had a good cause of action, had recently been very much discussed in the House of Lords in the case of the *Home and Colonial Stores v. Colls*, and the House of Lords intended to lay down rules which should be applied in future in cases of this class. Speaking without disrespect of the judges in the days gone by, he thought the decided cases were not quite consistent as to the tests to be applied. It was, therefore, obviously desirable that the differences, such as they were, in the principles laid down by those judges, should be settled once and for all. The great point of distinction between the two lines of cases was this. By one school of law the right of the house-owner gained by prescription, whether after the Prescription Act or before, was regarded as a mere right of property. By the other school this prescriptive right was regarded, not as a right of property to light, but as a negative easement, being a right to prevent a landowner from using his land so as to constitute a nuisance to the owner or occupier

of a house on the adjoining land. The House of Lords had adopted the view that the only right gained by prescription was in the nature of a negative easement. That view was shortly expressed by saying that the rights which were to be enforced in respect of this prescriptive easement were those which would be properly enforced by an action of nuisance. An action of nuisance was distinguished from an action of trespass. An action of trespass was brought where a person's property had been invaded. An action of nuisance was brought when there was no invasion of another person's property, but where the wrong consisted in so using your own land as to injure your neighbour. An action of nuisance would not lie unless that which was complained of amounted to a substantial interference with the plaintiff's comfortable or profitable occupation of his dwelling-house or warehouse or house of business, as the case might be. It was desirable that somehow or other no man should be allowed to enforce rights, the enforcement of which would interfere with the good and progress of the community. He came to the conclusion that the result of all the judgments of the law lords was that, in order to constitute an actionable nuisance, the obstruction to the access of light must be such as to sensibly interfere with the plaintiff's comfort and convenience in the use of his premises, having regard to their character according to the ordinary notions of mankind in this country. Unless the obstruction amounted to that there was no cause of action. Mere proof that a certain percentage of light was taken away was not sufficient.

Applying the principle laid down by the House of Lords in the *Colls* case to the findings of fact of Mr. Justice Kekewich, he agreed with the learned judge that there was here a good cause of action. He differed, however, from Mr. Justice Kekewich in thinking that the remedy ought to be damages and not a mandatory injunction.

Lord Justice Romer did not agree. In this case the house alleged to be injured was occupied by ordinary people for the common purposes of domestic living. It was not a case in which there was any extraordinary user of any kind of the premises. He considered, having regard to the decision of the House of Lords in the *Colls* case, that the principle to be applied to a case like the present was that the plaintiff must establish a nuisance. Taking the law as laid down in the case of the *City of London Brewery Company v. Tennant*, and strictly limiting it to the case in hand, an owner of ancient lights was entitled to sufficient light for the ordinary notions of mankind, for the comfortable use and enjoyment of his house as a dwelling-house, if, as in this case, it was a dwelling-house. In considering the question of the sufficiency of the light, the locality ought to be borne in mind, and light coming from other quarters ought not to be disregarded. Applying that law to the facts of the present case as found by Mr. Justice Kekewich, he (the Lord Justice) came to the conclusion that the plaintiff had failed to prove that the defendant had committed a nuisance. In arriving at that conclusion he was greatly impressed by the finding of Mr. Justice Kekewich that the plaintiff's morning-room was still a well-lighted room. To his mind the inference was that the plaintiff had now sufficient light for the ordinary purposes for which the room was used.

Lord Justice Cozens-Hardy agreed with the judgment delivered by Lord Justice Vaughan Williams.

By a majority of the Court, therefore, the judgment of Mr. Justice Kekewich was varied by the order for a mandatory injunction being discharged, and an inquiry as to damages being directed.

ACTION BY AN ARCHITECT.

THE case of *Ayrton v. C. Arthur Pearson, Ltd.*, came before the King's Bench Division and a special jury in the King's Bench Division on the 16th and 19th insts., an action brought by Mr. Ormrod Maxwell Ayrton, A.R.B., to recover from the defendants, 173l. 5s., the value of certain drawings he alleged had been wrongfully detained by the defendants. The plaintiff also alternatively claimed damages from the defendants on account of the drawings having been lost or destroyed in consequence of the defendants' alleged negligence.

Mr. H. F. Dickens, K.C., and Mr. R. E. Moore appeared for the plaintiff, and Mr. Montague Shearman, K.C., and Mr. A. B. Cano for the defendants.

Mr. Dickens, in the course of opening the case, said his client had formed the idea of making studies for weather-vanes which should be applicable to particular buildings.

The plaintiff had made certain designs, amongst others being a design of a coach and horses which would be appropriate for an inn. Another was a sportsman with a gun and dog, for a gamekeeper's cottage, and there was also a design of a man engaged in studying the line of a putt, with a caddie standing at the flag, which would be suitable for a golf clubhouse. The pictures were not easy to compose, it being necessary that the figures should be so arranged as to make the surface greater on one side than the other. Certain of these designs were published in a journal called the *Studio*, and the editor of *Pearson's Magazine* seeing them wrote to the plaintiff asking him to supply some of his designs in order that they might be reproduced in that paper, together with an explanatory article. The plaintiff ultimately agreed to supply sixteen designs and an article for the sum of 10*l.*, and in due course the article and designs were sent to the editor. The editor, in the course of his correspondence with the plaintiff, had written saying he should not require the full copyright of his designs. On December 3, 1903, the plaintiff wrote to the editor asking for the return of his drawings, and received a reply stating that the original drawings had been mislaid or lost. Five of the drawings which had not been used were returned to the plaintiff. The designs which the plaintiff had made were not for sale, so that their value must be assessed by what they were worth to the plaintiff for exhibition purposes, and for hanging in his office to enable his clients to see the kind of work he was capable of doing.

The plaintiff was called, and stated that he valued the drawings at an average of fifteen guineas each.

Cross-examined,

He knew of no custom where pictures sent for a magazine article belonged to the people who published the article. He had not registered the copyright, either in the pictures which had been returned or in those which were published.

Mr. Arthur Blomfield, F.R.I.B.A., gave evidence that the pictures had very great artistic merit, and, in his opinion, were worth the sum plaintiff valued them at.

Professor Moira, of the Royal College of Arts, and Mr. A. L. Baldry, an art critic, also gave evidence to the same effect.

For the defence, Mr. Clement Shorter, editor of the *Sphere*, said that, in the absence of contract to the contrary, it was the custom that illustrations sent with articles became the property of the proprietor of the paper to which they were sent. He thought the price the plaintiff asked for his drawings was absurd.

Mr. G. Hammond, art editor of the *Illustrated London News*, Mr. Stanley Wood, an artist, and Mr. H. P. Adams, an architect and surveyor, also gave evidence in support of the defendants' case.

In the result the jury returned a verdict for the plaintiff for 40*l.*, and judgment was given accordingly.

ACTION BY BUILDING OWNER AGAINST ARCHITECT.

The Lord Chief Justice, in the King's Bench Division, on the 13th inst., delivered a considered judgment in the case of Hodgson v. Waugh. (The case was reported in the *Builder*, December 3 and 10, 1904.)

In this case, the plaintiff, Mr. George Herbert Hodgson, a loom maker, of Baldon, near Bradford, Yorkshire, sued the defendant, Mr. John Waugh, an architect and civil engineer, practising in Bradford, to recover damages for alleged negligent breach of duty as architect, and also damages for alleged breach of contract. The defendant denied the alleged breach of duty and contract, and counter-claimed for fees for work done and services rendered.

The short facts were these:—In 1900 Mr. Hodgson, the plaintiff, purchased a large estate in Hertfordshire, known as Hexton Manor, situated halfway between Hitchin and Luton. It consisted of a large hall, and some 1,600 acres of land, and there were also residences, known as "Summerville," Hexton Lodge, Peggion Lodge, and Meg Cottages. The property had been in the hands of mortgages for some twenty years, and a great amount of alteration and repair being necessary, the plaintiff, being acquainted with the defendant, engaged him to do the work. The plaintiff alleged that, during his absence abroad in consequence of ill-health, the defendant had caused work to be done, and buildings to be erected which were not in accordance with the plans and estimates he had prepared, and which had been submitted to and approved by the plaintiff. The plaintiff alleged that, in several instances, the defendant had not followed his instructions,

and had expended a much greater sum on the different works than he knew plaintiff had intended spending. Defendant, on the other hand, justified everything he had done, and asserted that he had acted in the best interests of his client. During the course of the trial a great mass of detailed evidence was given with regard to the items of which the plaintiff complained—viz., as to the work on the various buildings on the estate, the cleaning of a lake, work upon a mill stream, a trout stream, and ponds, and, on November 23, his lordship reserved judgment.

Mr. Montagu Lush, K.C., Mr. Clavell Salter, K.C., and Mr. Compton appeared for the plaintiff, and Mr. Tindal Atkinson, K.C., and Mr. F. P. M. Schiller for the defendant.

His lordship delivered a long and elaborate judgment, in the course of which he said if he had understood the character of the case at the first he would not have tried it, but have sent it to an official referee. There was no doubt that the plaintiff had made charges against the defendant of a most serious character, but these had been rightly abandoned. One of the suggestions made was that the defendant had passed off as original plans of his own plans prepared by other people. Mr. Lush, at the close of the case, had stated that he did not suggest that the defendant had been guilty of fraudulent conduct, and a few days later he made a similar statement in Court to the effect that the plaintiff did not wish to suggest that the defendant had been guilty of fraud. All charges of fraud were therefore withdrawn, and that was quite proper. Those charges ought never to have been made. His lordship then dealt at considerable length with the oral and documentary evidence relating to the various heads of claim in the statement of claim (fully reported in our columns), and came to the conclusion that there was no justification for the allegations that had been made against the defendant in his capacity as an architect. There was, he said, no doubt that the plaintiff did complain of the amount the alterations, etc., had cost him, and which, unquestionably, exceeded his expectation, and this, perhaps, led to charges being made which were now quite properly withdrawn. His lordship was of opinion, on the evidence, that Mr. Dean, the holder of the plaintiff's power of attorney while the plaintiff was abroad, had been in the absence of the plaintiff as his authorised representative, and that the defendant consulted with him as such as to the works that were being effected. Mr. Dean also made reports to Mr. Hodgson from time to time as to the character of the work carried on. No suggestion was made that Mr. Dean had not carried out his duties properly. He was of opinion that the evidence was wholly insufficient to satisfy him that there had been any breach of contract on the part of the defendant. His lordship then went *seriatim* through the particulars in the defendant's counter-claim, and, in the result, found that defendant was entitled to 1,018*l.* He accordingly entered judgment for the defendant on the claim, and also for him on his counter-claim for 1,018*l.*, with costs. He said, in conclusion, that he sympathised a great deal with the plaintiff, as he certainly, at the outset, had thought the various works on the estate would be carried out at a much less cost than the contract price. The plaintiff at the time the works were executed was away from home, and was seriously ill, and he was satisfied that his memory betrayed him as to many points as to which he thought he had cause for complaint, and he was led to make charges against the defendant which he ought never to have made. He was satisfied that the defendant, in what he had done, had acted honourably, and that he had done nothing which gave the plaintiff a cause of action against him.

Mr. Clavell Salter: I ask your lordship to stay execution.

His lordship said he would on the terms that, if the plaintiff wished to appeal, he paid the defendant's solicitors the taxed costs of the action on receiving from them the usual undertaking to return the costs if the appeal should prove successful, and the plaintiff would also have to pay over to the defendant the 1,018*l.* found due to him on his counter-claim. There was no reason why the defendant should be kept out of his money any longer.

ALTERING LEASEHOLD PREMISES WITHOUT LESSORS' PERMISSION.

The case of Bailey and others v. Lewis came before Mr. Justice Swinfen Eady in the Chancery Division on the 9th inst., on a motion by the plaintiffs that a fit and proper person might, at the cost of the defendant, be appointed to carry out such of the acts required to be done so as to comply with the

mandatory injunction granted by the judgment in the action as modified by an agreement of November 1, 1901.

It appeared that the defendant was lessee of premises Nos. 16 and 17, Holles-street, W., and, by the lease, he was prohibited from altering the premises and using them for trade purposes. Defendant, however, made certain structural alterations in the premises. He pulled down the party wall and constructed flues to enable the premises to be heated with hot air. The plaintiffs commenced an action against the defendant, and obtained an order in the Chancery Division, on February 3, 1901, restraining defendant from altering the premises, and from permitting the alterations he had made to remain without the plaintiffs' consent. The defendant, not complying with this order, the plaintiffs obtained leave, on October 24, 1901, to issue a writ of attachment against the defendant. After that an agreement was entered into on November 1, 1901, between the plaintiffs, Lord Howard de Walden, and the defendant, an order being obtained discharging the order of attachment and staying its operation, this order being without prejudice to the judgment of February, 1901, save and except as the same was modified by the agreement, and of the plaintiffs' right to apply to the Court to enforce obedience to the said order. The defendant, having failed to obey the order as modified by the agreement, Mr. Justice Swinfen Eady directed that a writ of attachment should issue against him, and he was imprisoned. That was on June 12, 1903. The defendant was released from prison on July 10, 1903. In the affidavit that the defendant had made in support of his application for release from prison the defendant stated that he had instructed his architect to give orders to the contractors to carry out the judgment as modified by the agreement, and apologising for his contempt. It was now stated that the defendant had complied with all the requirements of the mandatory injunction except as to the flues, the defendant's case being, however, that the flues had been built with the plaintiffs' consent, and, therefore, that there was no obligation on him to remove the flues and restore the fireplaces formerly in the premises.

At the conclusion of the arguments of counsel, Mr. Justice Swinfen Eady, in giving judgment, said that the defendant had been playing with the Court, and he directed that the works should be carried out under the direction of the Court. He referred the matter of the appointment of a fit and proper person to carry them out to Chambers, and ordered the defendant to pay the costs of the motion.

WORKMEN AND THE CHECK SYSTEM.

MESSRS. F. & H. F. HIGG, builders, of Loughborough Junction, were summoned at the South-Western Police Court, on the 16th inst., by two of their bricklayers, Charles James Oford and William Back, who sought to recover sums deducted from their wages. The case was treated by the parties concerned as a test one.

The defendants, with a view of checking their workmen, and satisfying themselves that they were in daily attendance at their work, instituted a system by which each man was required to take a ticket, identified by a number, and place it in a box for reference. Defendants held that, if the men neglected to observe these conditions, they forfeited all claims unless they reported themselves at once to the responsible official. There was no attempt to deny that the complainants actually worked; in fact, this was admitted; but as they failed to observe the rules and regulations, payment was withheld.

After a lengthy argument the magistrate thought it unreasonable to refuse payment when work was actually done. He therefore made an order for payment of the amounts claimed, with costs.—*Daily News*.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

26,509 of 1903.—W. NICOL: *Windows*.

This invention relates to windows. According to the invention the sash frames are mounted to swivel on hinges, and, when these sash frames are made to slip up and down, the hinges would consist of plates with longitudinal bowled ends coiling into each other, the part of hinge screwed to fixed frame being formed with a flush plate which extends past the hawl part of hinge and prevents the other hinged plate and sliding part from rubbing

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

against woodwork in sliding up and down, and makes same easier fitted, the flush plate acting as a guide and giving a double thickness of metal and corresponding strength in screwing plate to fixed frame. In windows where the sash frames do not slide, the hinged plates would be formed of a knob or bent shape at the part where the bowl of hinge begins to form.

45 of 1904.—J. RICHMOND and R. F. CAREY: *Electrically-controlled Lifts.*

Mechanism for operating and controlling lifts, characterised by the employment of two travelling conducting wires connected to an insulated block attached to and moving with the balance weight or counterpoise of the lift, in such a manner that the conditions of installation and standardising of the parts are fully secured, said travelling conducting wires being employed in connexion with means for establishing electrical connexion from each floor or from the cage to either wires and a negative main, and a switch to determine the direction of movement of the cage.

1,570 of 1904.—R. STANLEY: *Manufacture of Tiles, Quarries, Paving Blocks, and Bricks.*

This invention relates to tiles, quarry, paving blocks, and bricks moulded from plastic or powdered substance, and is especially applicable to tiles and quarries made from clay or terra-cotta. The invention consists firstly of means and method for forming grooves in the edges of the tile, quarry, or other article during the process of manufacture, such grooves afterwards holding the cement when the articles are laid in position, with the useful result that the latter do not work loose or drop out of place after being set.

1,613 of 1904.—A. HOCH and C. HANNEMANN: *Telescopic Tables, Telescopic Desks, and the like.*

A table, desk or the like, and consists in the combination with a table board, of a prolongating plate, lying, if out of use, parallel to and beneath the table board, and means for guiding the prolongation plate into its proper position, consisting in substantially horizontal parallel grooves combined with inclined grooves.

1,619 of 1904.—E. WALDEN: *A Vertical Spring Gate or Door Latch.*

A vertical spring gate or door latch, consisting of a hollow cylinder provided with arms and plates for securing same to a gate or post, the cylinder made according to this invention being a latch rod working therein, the top portion of the latch being provided with a knob or ring, while the bottom is shaped to slide in a slot and engage with a catch plate.

1,740 of 1904.—J. A. LIDVALL: *Method of Manufacturing Radiators for Heating Purposes.*

A method of manufacturing radiators having vertical flanges on the outer sides, which consists in making the side walls of several flat or curved pieces, and in putting together the same with suitable top and bottom pieces so as to form radiators of wave-shaped or similar horizontal section.

1,758 of 1904.—ASHWORTH, KIRK, & CO., LTD., and W. T. PEARCE: *Feeding Mechanism of Wood-Moulding or the Wood-Working Machines.*

According to this invention the upper feed roller is made in the form of a truncated cone, and with a flange on its reduced end, say, about the same external diameter as its larger end. This flange is let into the fixed fence, which is recessed to admit it, so that the face of the flange is flush with that of the fence, and practically forms part of the same. The axis of the conical feed roller is preferably parallel to that of the lower feed roller, and it is tapered so that the angle between its face and that of the lower roller corresponds to the angle between the upper and lower face in section of the saw lengths of timber which are being moulded.

1,938 of 1904.—H. LINGARD: *Construction of Joints of Earthenware Drain Pipes.*

This consists in the combination with the socket end of an earthenware drain pipe, of an encircling flange (being an integral part of same) provided with an internal groove to receive liquid cement, and having an opening through the top for the insertion of same.

5,057 of 1904.—A. T. BUNTING: *Flouring Cramps.*

A floor cramp, consisting of an eccentric frame surrounding said eccentric, a face plate pivoted to said frame, tongues on said frame to engage grooves in the body of the cramp,

and means for effecting the working of the eccentric.

5,257 of 1904.—R. MORGAN: *Safety Guard for Hatchets and Adzes.*

The guard is made of tin to fit the sharp or cutting end of hatchet or adze, and is so made, by means of a row of holes and pin, to fit in same that one can fit several sizes. The bottom piece is made of wood. A lock could be placed on same when necessary, to prevent an offender taking the guard off and using hatchet or adze, as the case may be.

22,301 of 1904.—A. J. BOULT (Bayerische Betonbau-Gesellschaft, G.m.b.H.): *Building Blocks or Structures.*

Heavy blocks for ceilings, and the like, characterised by the construction of the hollow stone being reduced from a parallel girder with intersecting ribs, each block containing two or more intersecting ribs, and at the same time a projecting edge on one side, and a recess on the other side.

22,423 of 1904.—W. FAIRWEATHER (A. B. Nettleton): *Composition of Matter for Fire-proof Paint or Coating.*

A fireproof composition, consisting of equal parts of finely-powdered carbide of silicon, and semi-liquid silicon of sodium, and from three to ten parts of calcium carbonate in 100 parts of the composition.

22,729 of 1904.—J. O. PARKINSON: *Removable Wall and Ceiling Coverings.*

A covering for walls or ceilings, consisting of a suitable frame, composed of parallel bars and two series of plates or tiles, one of which series is adapted to be engaged with the bars of said frame by means of an oblong flange or two oppositely projecting lugs formed at the free end of a concentric trunk thereon, and the other of which is adapted by means of a concentric screwed shank, to be fixed to nuts slidably carried by said bars, two series of plates or tiles being formed with grooves and tongues so that they engage with each other.

22,730 of 1904.—C. H. SHOFFER: *Facing Bricks.*

This invention relates to improvements in the bricks described in the Specification to Patent No. 17,881 of 1891. According to this invention, instead of making the dovetail at the back of the brick extend from end to end as before, it is now divided into two or more parts with spaces, preferably dovetailed between. By this means the bricks are not only lightened, but a more secure hold is also provided for the concrete.

22,896 of 1904.—A. L. LAVALLEY: *Garden Frames.*

A garden frame, comprising, in combination, a base frame or box, having ends of inverted V-shape, or span roof-like contour, a sash or light, consisting of two parts foldably connected together, and a rack and pin device at each side of the said parts.

1,899 of 1904.—J. GLOVER: *Method of and Appliances for Testing the Joints of Pipes.*

A method for testing pipe joints, which consists in forming a circumferential fluid-tight chamber round the joint on the inside of the pipe, forcing fluid under pressure into this chamber, and then observing where the pressure in the chamber remains constant or diminishes, whereby any leakage through the joint can be ascertained.

1,769 of 1904.—J. MORE: *Construction of Theatres and like Public Buildings.*

This relates to theatres and like public buildings, and consists in providing a flue above the stage, the flue being fitted with a damper adapted to be automatically or otherwise opened on a fire occurring upon, or in the vicinity of, the stage, in order that resulting flames or gases may be deflected therethrough and prevented from entering the auditorium.

6,045 of 1904.—F. A. WILKINS: *Supports for Street Decoration.*

A means for decorating and for supporting decorations, comprising light trellis or other arms adapted to secure to venetian masts, electric light and similar standards, or to houses whereby decorations can be extended over the street or in any other desired direction.

15,123 of 1904.—W. ECKSTEIN: *Treads for Staircases, Landings, Foot Paving, Floors, and the like.*

This consists in the arrangement and construction of staircase treads, landings, pavings, or the like, so as to allow of the interchange of such renewable portions or panels giving a number of different exchanges of wearing or working surfaces, by turning the panels round from back to front, or right to left, or by interchanging them one with another so as to obtain a maximum of wearing qualities from the surfaces treated.

22,547 of 1904.—H. H. LAKE (Chemisch Technische Fabrik Dr. Alb. R. W. Brand & Co., G.m.b.H.): *Process for Colouring Natural Stone.*

A process for staining or colouring marble and other natural stones throughout their substance with metallic deposits, consisting in dissolving metallic oxides in essential oils, and introducing them into the stone simultaneously with strong organic acids.

SOME RECENT SALES OF PROPERTY:

Table listing various property sales including ESTATE EXCHANGE REPORT, ROYDON, ESSEX, HAMMERSMITH, and various other locations with details on acreage, price, and terms.

Table listing various construction materials and services with prices. Includes entries for Holloway, Tollymore, Southgate, and various brick and stone products.

TO CORRESPONDENTS.

W. M. (We cannot undertake to find answers to such questions). NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and flying addresses. Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing prices for various materials including Hard Stocks, Facing Stocks, Shippers, Flettons, Bed Wire Cuts, Best Farnham Bed, Best Bed Pressed, Buabon Facing, Best Blue Pressed, Staffordshire, Do. Bullnose, Best Stourbridge, Fire Bricks, GLAZED BRICKS, Best White and Ivory Glazed, Stretchers, Headers, Quoins, Bullnose, and Double Stretchers.

Table listing prices for BRICKS, &c. (continued), including Quoins, Bullnose, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered, Squints, Second Quality, White and Dipped Salt Glazed, Thames and Pit Sand, Brown Whited, Best Portland Cement, and Best Ground Blue Lias Lime.

Table listing prices for STONE, including Bath Stone, Portland Stone, Ancaster in blocks, Beer, Greenhall, Darley Dale in blocks, Bed Corsehill, Closeburn Red Freestone, and Bed Mansfield.

Table listing prices for YORK STONE—Robin Hood Quality, including Scappled random blocks, 6 in. sawn two sides, 6 in. rubbed two sides, and 3 in. sawn two sides.

Table listing prices for HARD YORK, including Scappled random blocks, 6 in. sawn two sides, 6 in. rubbed two sides, 3 in. sawn two sides, and 2 in. self-faced random flags.

Table listing prices for HOPTON WOOD (Hard Bed) in blocks, including 2 3/4 per ft. cube, 6 in. sawn both sides landings, and 3 in. do.

Table listing prices for SLATES, including 2 1/2 x 10 best blue Bangor, 20 x 12, 20 x 10 first quality, 20 x 12, 16 x 8, 20 x 10 best blue Portmadoc, 16 x 8, 20 x 10 best Eureka unfading green, 20 x 12, 18 x 10, 16 x 8, 20 x 10 permanent green, and 18 x 10.

Table listing prices for TILES, including Best plain red roofing tiles, Hip and Valley tiles, Best Brosey tiles, Do. Ornamental tiles, Hip and Valley tiles, Best Buabon red, brown, or brindle do., Do. Ornamental do., Hip tiles, Valley tiles, Best Red ornotted Staffordshire do., Do. Ornamental do., Hip tiles, Valley tiles, Best "Rosemary" brand plain tiles, Best Ornamental tiles, Hip tiles, Valley tiles, Best "Hartshill" brand plain tiles, Do. pressed, Do. Ornamental do., Hip tiles, and Valley tiles.

Table listing prices for WOOD, including Deals, Battens, Foreign Sawm Boards, Fir timber, and Second yellow deals.

Table listing prices for JOINERS' WOOD, including White Sea, 3 in. by 11 in., Battens, Second yellow deals, and White Pine.

Table listing prices for Yellow Pine, Yellow Pine oddments, Kauri Pine, Danzig and Stettin Oak Logs, Wainscot Oak Logs, Dry Wainscot Oak, Dry Mahogany, Dry Walnut, and Teak.

Table listing prices for Prepared Flooring, including 1 in. by 7 in. yellow, planed and shot, 1 in. by 7 in. yellow, planed and matched, 1 1/2 in. by 7 in. yellow, planed and matched, 1 in. by 7 in. white, planed and shot, 1 in. by 7 in. white, planed and matched, 1 1/2 in. by 7 in. white, planed and matched, 3 in. by 7 in. yellow, matched and beaded or V-jointed brds., 1 in. by 7 in. do., 1 in. by 7 in. white do., and 6 in. at 6d. to 9d. per square less than 7 in.

Table listing prices for JOISTS, GIRDERS, &c., including Rolled Steel Joists, Compound Girders, Angles, Tees and Channels, Flitch Plates, and Cast Iron Columns and Stanchions.

Table listing prices for METALS, including Iron, Common Bars, Staffordshire Crown Bars, Merchant quality, Staffordshire "Marked Bars", Mild Steel Bars, Hoop Iron, Galvanized, Sheet Iron, Black—Ordinary sizes to 20 g., 24 g., and 26 g.

METALS (continued).

Table listing various metal products such as Sheet Iron, Galvanized flat, ordinary quality, and their prices per ton in London.

LEAD, &c.

Table listing lead products including Sheet, English, 3lb. and up, and various pipes, with prices per ton.

ENGLISH SHEET GLASS IN CRATES.

Table listing different sizes of English sheet glass in crates, such as 15 oz. thirds and 26 oz. thirds, with prices per 100.

OILS, &c.

Table listing various oils including Raw Linseed Oil, Turpentine, and others, with prices per gallon.

VARNISHES, &c.

Table listing various types of varnishes such as Fine Pale Oak, Superfine Pale Elastic Oak, and others, with prices per gallon.

TENDERS.

Communications for insertion under this heading should be addressed to 'The Editor' and must reach us not later than 10 a.m. on Thursdays.

Table of tenders for Alderley Edge, listing contractors like G. Fresman, J.S. Dawson, and others, along with their respective amounts.

Table of tenders for Blaenavon, listing contractors like R. L. Roberts, J. Hatherley, and others, with their respective amounts.

Table of tenders for Bristol, listing contractors like W. Cowlin & Son, J. A. Hayes, and others, with their respective amounts.

Table of tenders for Brockley, listing contractors like F. H. Eley, W. & D., and others, with their respective amounts.

Table of tenders for Great Grimsby, listing contractors like Rands & Lindup, M. Hatcliffe, and others, with their respective amounts.

Table of tenders for Great Missenden (Bucks.), listing contractors like Mr. Alfred Dunnhill, R. High-road, and others, with their respective amounts.

CUCKFIELD.—For 3,400 yds. of 4-in. and 400 yds. of 3-in. cast-iron water mains, for the Rural District Council.

Table of tenders for Cuckfield, listing contractors like J. & R. Ritchie, H. Green & Co., and others, with their respective amounts.

GRIMSBY.—For plumbing work required for new observation block and new discharging ward at the Smallpox Hospital, Lacey.

Table of tenders for Grimsby, listing contractors like D. J. Dobby, J. W. Robson, and others, with their respective amounts.

HEBBURN.—For street works, for the Urban District Council. Mr. H. Paterson, Surveyor, Argyle-street, Hebburn.

Table of tenders for Hebburn, listing contractors like J. MacHarg, J. Wardlaw, and others, with their respective amounts.

HORLEY.—For the erection of a new council school, for the Surrey Education Committee.

Table of tenders for Horley, listing contractors like T. Vaughan & Sons, A. White & Co., and others, with their respective amounts.

GREAT YARMOUTH.—For 800 tons of steel girder tramway rails, for the Town Council.

Large table showing tender prices for Great Yarmouth, categorized by Straight Rails, Curved Rails, Fish-Plates, Sole-Plates, Tie-Bars, Bolts, and Total Tender amounts.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Alters, etc., to Premises, Bridge-st. Downham Market	Co-operative Society	C. S. Bosdet, Sec., St. Helier's, Church-road, Downham Market.	Dec. 23
One mile of 3-in. Water Main, Bidborough	Tonbridge R.D.C.	F. Harris, Engineer, Broadway, Southborough, Tunbridge Wells	do.
Repair of Embankments, North Side of River Clyde	Glasgow Corporation	Office of Public Works, City-chambers, Glasgow	do.
Sewage Tanks, etc. (Glasburn Sewage Works)	Skipton R.D.C.	H. A. Johnson, Engineer, 15, The Exchange, Bradford	Dec. 24
Sluice Valves, etc.	Runcorn U.D.C.	J. Welding, Surveyor, Town Hall, Runcorn	Dec. 27
5,300 lineal yds. of Water Main	do.	do.	do.
155 tons of Cast-Iron Pipes, 12 in. diameter	Manchester Corporation	Secretary, Waterworks Offices, Town Hall, Manchester	do.
3 tons of Special Castings	do.	do.	do.
Removal of House Refuse	Chesterton R.D.C.	J. F. Symonds, 9, Benet-street, Cambridge	Dec. 28
Making-up Roads	Surbiton U.D.C.	J. Bell, Council Offices, Ewell-road, Surbiton	do.
Alteration, etc., of Premises, Market-street South	Hetton Downs Amic. & Indus. Soc.	J. W. Holbrook, Surveyor, Houghton-le-Spring	do.
Extension of Vegetable Market, St. James's Market	Bradford Corporation	F. E. P. Edwards, City Arch., Whittaker-hlds., Brewery-st., Bradford	do.
Additions, etc., Girls' H. Schl., Frenchgate, Richmond	Bristol Dock Committee	Clark & Moscrop, Architects, Darlington	do.
Two Steel Hopper Barges	Greenwich Guardians	At the Union Offices	Dec. 29
200 tons of Guernsey Granite Spalls	The Corporation	City Engineer, 64, Cochrane-street, Glasgow	do.
Buildings, Stockwell-street, Glasgow	East Ham Corporation	W. H. Barker, Town Hall, East Ham	do.
Tools for Carpentry, etc., at Technical College	Sunderland Corporation	J. P. C. Snelk, M.Inst.C.E., Town Hall, Sunderland	Dec. 30
One Wooden Cooling Tower	Hull Property Committee	J. H. Hirst, City Architect, Town Hall, Hull	do.
Work at Basement and Shops (part of Public Hall)	Edinburgh District Lunacy Board	J. & A. Leslie & Reid, C.E., 72A, Great George-street, Edinburgh	do.
Station Buildings, Dechmont, Upball	Halifax Commercial Banking Co., Ltd.	J. Watson, F.S.I., Cogan-chambers, Bowalley-lane, Hull	Dec. 31
Bank Premises, Whitefargate, Hull	do.	W. Phillips, Rose Mount, Llanbradach	do.
Billiard Room, Llanbradach Workmen's Hall	Harrogate Corporation	E. Bagshaw, Borough Engineer, Market Offices, Harrogate	do.
Flags (Twelve Months' Supply)	Horfield Court Farm Estate	W. P. Sanders, Arch. and Surv., Rupert-chbrs., Quay-st., Bristol	do.
Pulling Down Old Buildings	do.	do.	do.
Formation of Roads and Sewers	do.	P. Cathrick, The Green, Piercebridge	do.
Enlarging Church School at Piercebridge	Mr. Troke	R. M. Challice, Architect, 14, Bedford-square, Exeter	do.
Shops and Dwellings, 29 and 30, Bridge-st., Exeter	Wrexham Town Council	Borough Surveyor, Willow-road, Wrexham	do.
Granite Setts and Channel Blocks	Hull Libraries Committee	J. H. Hirst, City Architect, Town Hall, Hull	Jan. 2-05
Electric Light Installation, West Park Library	do.	do.	do.
Fittings, West Park Library, Anlaby-road	Liverpool Select Vestry	H. J. Hagger, Parish Offices, Brownlow-hill, Liverpool	do.
Flooring and Slatting Dining-hall, Kirkdale	Eton U.D.C.	J. Simmonds, Surveyor, Bridge Trust House, Eton	do.
1,010 super. yds. of Concrete Slab Paving	do.	do.	do.
1,630 ft. run of Guernsey Granite Kerb	do.	do.	do.
1,252 ft. run of Channels, etc.	Bradford Corporation	F. E. P. Edwards, City Architect, Brewery-street, Bradford	do.
Alterations and Fittings, Darley-street Library	Largan Town Council	F. W. Pollock, Town Clerk, Town Hall, Largan	do.
900 superficial yds. of Ferrimite Flagging	do.	do.	do.
100 lineal yds. of Granite Kerbs	do.	do.	do.
20 tons of Granite Setts	East Dereham U.D.C.	H. G. Himson, Surveyor, East Dereham	do.
500 super. yds. Artificial Stone Pavement	Blything Guardians	H. A. Mullens, Clerk, Union Workhouse, Blything	do.
100 tons of Granite Blocks	Borough of Paddington	Borough Surveyor, Town Hall, Paddington, W.	do.
Granite Setts, Flint Gravel, etc.	King & Sons, Ltd.	C. H. Burstow, Architect, 6, West-street, Horsham	do.
Additions to Elephant and Castle, West Chillington	do.	H. A. Johnson, 15, The Exchange, Bradford	Jan. 3
Concrete Storage Tank, etc., Olley Convalescent Home	Select Vestry of Christ Church	E. Eccles Buchanan, C.E., Architect, Castle-street, Londonderry	do.
Schools, Derry	Belfast Guardians	J. R. Robb, Clerk, Union Workhouse, Belfast	do.
Ironwork for Strong-room, etc., at Workhouse	do.	do.	do.
Brickwork for Strong-room at Workhouse	King's Lynn Corporation	H. J. Weaver, Borough Engineer, Town Hall, King's Lynn	do.
Stores	Bary and District Joint Water Board	E. B. Right, Waterworks Manager, Parns-lane, Bary, Lancs.	do.
Iron Castings	Manchester Rivers Committee	W. H. Talbot, Town Clerk, Town Hall, Manchester	do.
830 lineal yds. of Steel Sludge Main, Withington Wks.	do.	do.	do.
Suction Gas Pla., Eng., Pump, etc., Withington Wks.	Wealdstone U.D.C.	H. Walker, Surveyor, Council Offices, Wealdstone, Middlesex	do.
Making-up, etc., Roads	Clyde Navigation Trustees	J. O'Neill, Clerk, Board Room, North Dublin Union	Jan. 4
Storage Ground, Shilhall	North Dublin Guardians	do.	do.
Sanitary Annex at Workhouse	do.	do.	do.
Plumbing Work for Workhouse	East Indian Railway Company	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Steel Material	C.B. of Great Yarmouth	F. Frohiser, Engineer, Town Hall, West Yarmouth	do.
1,250,000 Tarran or Karri Paving Blocks	Fleetwood U.D.C.	Surveyor to Committee, Town Hall, West Disbury	Jan. 5
Radclyffe Road Works	Manchester Corp. (Withington Com.)	C. Nickson, Gas Offices, Town Hall, Manchester	Jan. 6
Extension, etc., of Roads	Manchester Corporation	J. Wagar, H.M. Office of Works, Storey's-gate, S.W.	do.
Erection of Post Office, Chelsea	Commissioners of H.M. Works, etc.	E. J. Harvey, Surveyor, Yantnor	do.
Pier Repairs	Ventnor U.D.C.	F. J. C. May, Borough Engineer, Town Hall, Brighton	do.
Dressed Granite Kerb and Channel	Brighton Corporation	W. Rodger, Borough Surveyor, Wishaw	Jan. 7
Main Gutfall Sewer Works	Wishaw Town Council	Company's Engineer, Buchanan-street Station, Glasgow	Jan. 9
Station-Master's House, Strathaven	Caledonian Railway Company	H. Lord, F.R.I.B.A., 42, Deansgate, Manchester	do.
Schools, Stamford Park, Hale	Cheshire C.C. Education Committee	G. H. Fry, Clerk, District Council Offices, Erith, Kent	do.
Overhead Line Equipment, Poles, etc.	Erith U.D.C.	do.	do.
Underground Feeder Cables, Boxes, etc.	do.	do.	do.
Rotary Converters, Transformers, etc.	do.	do.	do.
Switchboards, Cable Connections, etc.	do.	do.	do.
Screen & Internal Structure for Public Convenience	Cardiff Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
Sanitary Fittings for Convenience, Eastmoors	do.	do.	do.
Dispensary, etc., for Dunganstown Dispensary Dis.	Rathfrim Guardians	G. T. Moore, C.E., 1 and 2, Foster-place, College Green, Dublin	do.
Execution of Work and Supply of Materials	Wandsworth Borough Council	Town Clerk, Council House, Wandsworth, S.W., Halifax	do.
House and Studio, Rhodes-street, Halifax	do.	Medley Hall, Architect, 1, Harrison-road, Halifax	Jan. 10
Masonry Reservoir for 85,000 gallons	Newton Abbot R.D.C.	S. Segar, Engineer, Union-street, Newton Abbot	do.
900 ft. of 4-in. Cast-Iron Water Mains	do.	do.	do.
Laundry Engine, etc., Dis. Lun. Asylum, Killybeg	Ilford U.D.C.	L. T. Griffin, Resident Medical Superintendent	do.
Making-up Green-lane (South Side)	H.M. Works Commissioners	H. Shaw, Surveyor, Town Hall, Ilford	do.
New Post Office at Shorncliffe Camp	Grays Thurrock U.D.C.	H.M. Office of Works, Storey's-gate, Westminster, S.W.	do.
270 lineal yds. of Wrought-Iron Fencing, etc.	Merthyr Tydfil U.D.C.	A. C. James, Surveyor, High-street, Grays	Jan. 11
Council School, Webster-street, Trebars	do.	J. Clevelin Smith, Architect, 67, High-street, Merthyr Tydfil	do.
School and Cookery Centre	Wimbledon Education Committee	The Clerk, Council Offices, Wimbledon, S.W.	do.
One Water Van and One Slop Cart	Clacton U.D.C.	A. R. Robinson, Surveyor, Town Hall, Clacton-on-Sea	do.
Road-making, etc., at Hamlet-gdns. and Grinston-rd.	Borough of Hammersmith	Borough Surveyor, Town Hall, Hammersmith, W.	do.
Erecting Engineer's Cottages	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
Form, etc., New-rc., Remov. Ddry. Wall, N. Hcs.	do.	do.	do.
New Post Office, Dorchester	Commissioners of H.M. Works, etc.	Post Office, Dorchester	Jan. 12
Vested National Schools, Dee-street, Belfast	R.D.C.	W. D. R. Taggart, Architect, Scottish Provident-buildings, Belfast	do.
Thirty-three Labourers' Cottages, Killybeg	do.	E. K. Cornford, Clerk	do.
Shops, etc., Commercial-street, Halifax	Evesham R.D.C.	J. Clement, Architect, 29, Deansgate, Halifax	Jan. 13
Broadway Sewerage (4,500 yds. Pipe Sewer)	Port Elizabeth Municipal Corp.	R. E. W. Berrington & Son, Engineers, Wolverhampton	Jan. 14
Electric Plant	Kildermulster Corporation	Davis & Soper, 54, St. Mary Axe, London, E.C.	Jan. 16
Engine House, etc. (Water Supply: Contract No. 3)	Wimbledon Education Committee	Willcox & Raikes, Engineers, Union-chbrs., 83, Temple-row, B'ham.	Jan. 20
Footbridge and Approach Road Over Surrey Canal	Edinburgh, etc., Gas Commissioners	The Clerk, Council Offices, Stratford, London, E.	Jan. 23
Gasworks Plant and Appliances	do.	W. R. Herring, M.Inst.C.E., New-street Gasworks, Edinburgh	Jan. 30
Block of Buildings, Terrington St. Clement	do.	L. F. Bagleton, Architect, King-street, King's Lynn	No date.
Steam Boiler Chimney at Royal Infirmary, Bradford	do.	F. Holland, Engr., 11, Parkinson's-chbrs., Hustlergate, Bradford	do.
Church, etc., Woodhouse	do.	J. P. Earle, Architect, Norfolk-row, Sheffield	do.
Cast-Iron Columns and Steel Girders	Hart Accumulator Co., Ltd.	Manager, Marshgate-lane, Stratford, London, E.	do.
Alters, etc., to Premises, 25, Bachelor's-walk, Dublin	Mr. J. F. Keogh	H. Shaw, Architect, 5, Westmoreland-street, Dublin	do.
Public Library, Hamilton	Hamilton Town Council	A. Cullen, F.R.I.B.A., Brandon-chambers, Hamilton	do.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, Applications to be in. Includes Hackney Borough Council, Brentford U.D.C., London C.C., and City of Sheffield Education Com.

Those marked with an asterisk (*) are advertised in this number. Competitions— Contracts, iv. vl. viii. x. Public Appointments, xvi.

TENDERS.—Continued from page 679.

KEADY (Co. Armagh).—For erecting new premises, for the Northern Banking Company, Limited. Mr. H. C. Parkinson, architect, Armagh. Quantities by Messrs. W. H. Stephens & Sons, Donegal-square North, Belfast.

KIRKBY-IN-ASHFIELD.—For the construction of new gasworks, for the Urban District Council. Mr. R. O. Shadforth, engineer, gasworks, Grantham.— R. Bonfield, Sons, Ltd., Elland, Yorkshire. £13,894 10 0

LONDON, SYDENHAM HILL-ROAD (Alterations in Infants' Department).

[That expenditure not exceeding 274l. be sanctioned in respect of the execution of additional improvements in the infants' department of the Sydenham Hill-road School; that the work be executed by Messrs. J. & C. Bowyer, contractors for the engagement of the boys' and girls' departments of this school; and that the actual cost be calculated on completion on their contract schedule of prices for the works in progress.]

Brixton, Hackford-road (Teachers' room). J. Marsland & Sons, £299 H. Leney & Son, £215 Holliday & Green, J. Garrett & Son, 213 wood, Ltd., 293 W. J. Coleman & Co., 213 Maxwell Bros., Ltd., 288 Wynno-rd., Brixton* J. F. Ford, 223 ton* E. Triggs, 229 185

Levensham, Levensham-bridge (Partitions, etc.). Davis & Bennett, £1,090 0 0 J. Grundy, 999 0 0 Warner, Pfeifferer, & Perkins, Ltd., 965 3 4 Stevens & Sons, 950 0 0 J. & P. May, 840 0 0 A. Macintosh & Sons, Ltd., 835 0 0 J. DeWries & Sons, Ltd., 770 15 0 Brightdale Foundry & Engineer, Ltd. Co., Ltd., 28, Victoria-st., 777 0 0

Wandswoth, Hearnville-road New School (Heating apparatus). J. Grundy, £989 0 0 E. B. Tucker, 875 0 0 J. & P. May, 780 0 0 Stevens & Sons, 778 0 0 W. G. Cannon & Sons, 778 0 0 Sons, 780 0 0 Stowe & Co., 693 0 0 J. Yetton & Co., 690 0 0 Palowkar & Sons, 674 0 0 W. W. W. Smith, 674 0 0 W. R. & A. Hide, 615 R. S. Ronald, 590 J. & M. Patrick, 553 S. Polden, 476 General Builders, Ltd., 549 E. Triggs, 460 T. Hooper & Son, 530 R. A. Jewell, 30, North-street, Wandswoth* 446

Levensham, Levensham-bridge (Partitions, etc.). P. Parrott & Isom, £1,198 G. Munday & Sons, £687 E. A. Fawkes, 839 Vigor & Co., 649 Turnbull & Son, 735 J. Grover & Son, 623 E. Spencer & Co., 727 F. Bull, 621 A. B. Symes, 709 W. Lawrence & Son, J. T. Robey, 690 Canal Works, H. Bouneau, 687 Waltham Cross* 529 A. J. Sheffield, 687

Kensington, N., Wornington-road (Partitions, etc.). W. & C. Brown, £799 R. E. Williams & Sons £510 W. R. & A. Hide, 615 R. S. Ronald, 590 J. & M. Patrick, 553 S. Polden, 476 General Builders, Ltd., 549 E. Triggs, 460 T. Hooper & Son, 530 R. A. Jewell, 30, North-street, Wandswoth* 446

Deptford, Lucas-street (Store for trustees' furniture). Rice & Son, £210 H. Oroyes, £258 C. J. Jerrard, 295 J. & C. Bowyer, 253 T. D. Leng, 286 H. Lino, 81, Peckham-rd., 285 E. Triggs, 285

Poplar, Doolley Hill-road (Adaptation of iron building for physically defective children, etc.). Parrott & Isom, £499 0 F. Smith & Co., 270 0 J. T. Robey, 337 0 A. J. Sheffield, 270 0 S. S. Elkington, 328 0 T. Hooper & Son, 328 0 Co., The Works, A. Leather, 326 0 Ashford, Middlesex* 210 0 Vigor & Co., 320 0 W. Harbrow, 295 0

Hackney, S., Lamb Lane Special School (Partitions, etc.). J. Grover & Son, £209 McCormick & Sons, £209 T. S. Porter, 208 Northampton-st., J. Stewart, 178 Essex-road* £169 H. Bouneau, 174

Stepney, Settles-street (Reconstructing boiler flue). J. Grover & Son, £256 Stevens Bros., £216 0 A. J. Sheffield, 250 0 Rockhill Bros., 202 10 S. S. Elkington & T. S., 240 0 J. Dolman & Co., 198 0 Marchant & Hies, 239 0 Vigor & Co., King-street, Poplar*, 176 10 F. Bull, 219 0

Haggerston, Fellows-street (Stoves). G. Munday & Sons, £148 A. J. Sheffield, £125 M. Pearson, 136 Marchant & Hies, 125 G. S. S. Williams & Son, 132 Stevens Bros., 123 J. Grover & Son, 132 St. Upper Clapton* 122 Fulham, Ackmar-rd. (1. Stepping, etc.; 2. Play-sheds). Poplar, Culloden-street (Play-shed). Ackmar-rd., Culloden-street. Partition, etc. Play-sheds. Play-shed. W. R. & A. Hide, £123 175 0 J. & M. Patrick, 129 0 £99 E. B. Tucker, 108 158 0 S. Polden, 105 156 10 60 Lathley Bros., St. George's Works, New-road, Battersea-park*, 107 145 0 47 W. Hammond, 129 135 0 R. S. Ronald, 120 120 0 70

Fulham, St. Dunstan's-road (Ventilation works). E. B. Tucker, £188 W. Hammond, £119 S. Polden, 139 Lathley Bros., St. George's Works, New-road, Battersea-park*, 130 sea Park* 107 Bethnal Green, S.W., Turin-street (Ventilation works). J. T. Robey, £199 A. J. Sheffield, £86 Vigor & Co., 146 M. Pearson, 146 G. S. S. Williams & Son, 106 rye* 77 T. S. Elkington & Son, 99

Wandswoth, Oak Lodge Residential School for Deaf Girls (External emergency iron staircase). Ashton & Green Iron Co., Ltd., £235 0 0 McDowall, Steven, & Co., Ltd., 202 0 0 E. E. Bailey, 162 0 0 A. Ritchie & Co., 159 9 6 St. Pancras Iron Works Co., Ltd. (specification B), 159 0 0 Hayward Bros. & Eckstein, Ltd., 187, Union-street, Borough, S.E.* 156 10 0 St. Pancras Iron Works Co., Ltd. (specification A), 147 0 0

Hoxton, Chatham-gardens (Gleaming). [That the resolution of November 29, accepting the tender of Messrs. C. Deering & Son for cleaning the interior of the Chatham-gardens School (Hoxton) during the Christmas holidays, be rescinded. (2) That the tender of Messrs. Barrett & Power, amounting to 120l., for cleaning the interior of the Chatham-gardens School (Hoxton) during the Christmas holidays, be accepted.—Agreed.]

Battersea, Holden-street (Reinstatement after fire). [That expenditure not exceeding 450l. be sanctioned for carrying out the work of reinstatement after fire at the Holden-street School (Battersea); that the offer of Messrs. Johnson & Co. to carry out the necessary work under the Council's printed schedule of prices, with an addition of 5 per cent. thereto, be accepted.—Agreed.]

Camberwell, N., Gretton-road (Sanitary improvements, additional work). [That additional expenditure, not exceeding 132l., be sanctioned for taking up the defective drains in the girls' playground at the Gretton-road School, Camberwell, N., and relaying them in iron with watertight joints, and also for providing temporary offices; and that the cost of this extra work be calculated as a variation upon the contract of Mr. A. Porter for carrying out sanitary and drainage works at the school.—Agreed.]

Greenwich, Randall-place (Schools for deaf and physically defective children). Rice & Son, £7,171 J. & C. Bowyer, £6,540 J. Smith & Sons, J. Longley & Co., 6,428 Ltd., 6,736 W. J. Mitchell, 6,280 G. E. Wallis & Sons, Son, 6,894 Ltd., 6,238 T. D. Leng, 6,684 Martin, Wells, & Co., E. & H. F. Higgs, 6,617 Ltd., 6,185 Holliday & Green-wood, Ltd., 6,594 J. Appleby & Sons, 6,584 North Woolwich* 6,178 [The architect's estimate comparable with these tenders is £6,064.]

LONDON.—For proposed new sorting rooms and offices at the Anglo-American Laundry, Lower Toxtot, for Mr. D. Wynter. Plans by Mr. S. J. Reynolds, Kelgate. Quotations by Mr. J. Kennard, Croydon, £1,432 Josyala & Young, £1,875 W. Smith & Son, £1,432 A. Black & Son, £1,510 W. Akers & Co., Truett & Steel, 1,490 South Norwood* 1,375 A. Funnell & Co., 1,459 D. D. Barker, 1,318

LONDON.—For the manufacture, supply, delivery, and erection of the gas engines required at the new Falcon-brook pumping station, at the junction of York-road and Creek-street, Battersea, for the London County Council.— The British Westinghouse Co., £8,140 0 0 Fielding & Platt, 7,855 0 0 Tangyus Ltd., 6,580 0 0 Crossley Bros., 5,925 0 0 Railway and General Engineering Co., 5,500 0 0 Campbell Gas Engine Co., Halifax*, 5,300 0 0 Acme Engineering Co., 4,896 0 0 Wenham & Waters, in conjunction with the Acme Engineering Co., 4,311 0 0 Donogh's Engineering Co., Ltd., & A. Dougill & Co., Ltd., 4,322 10 0

LONDON.—For the supply, delivery, and erection of the seven east-iron water tanks required for the first portion of the Greenwich generating-station, for the London County Council.— T. Lister & Co., Ltd., £2,847 0 0 Caledonian Engineering & Shipbuilding Co., 2,585 0 0 Eastwood & Swingle, & Co., Ltd., 2,113 10 0 Northamptonshire Direct Castings Co., Ltd., 2,024 8 0 Widnes Foundry Co., Ltd., 1,961 3 3 Ashton & Green Iron Co., Ltd., 1,828 10 0 Moorwood, Sons, & Co., Ltd., 1,879 9 0 Foster Bros., 1,843 10 0 J. Williamson & Co., 1,804 13 10 Matley & Platt, Ltd., 1,778 4 0 Stanton Iron Works Co., Ltd., 1,727 5 10 J. Cochrane & Sons, 1,725 10 0 alternative 1,630 0 0 H. J. & A. Coulthurst, 1,700 18 6 Head, Wrigtonson, & Co., Ltd., 1,699 0 0 Gimson & Co., Ltd., 1,667 10 0 T. Piggett & Co., Ltd., 1,667 10 0 Westwood & Wriggless, 1,664 0 0 C. & W. Walker, Ltd., 1,645 9 8 K. Carr & Co., 1,645 4 6 Bennett, Sons, & Shears, Ltd., 1,641 0 0 J. Abbot & Co., Ltd., 1,638 15 0 J. Frazer & Son, 1,591 15 0 Ransomes & Rapier, Ltd., 1,577 1 0 Tibbington Foundry Co., 1,568 2 6 W. Lacey & Co., Ltd., 1,564 11 0 E. J. Raybould, Ltd., 1,557 5 0 W. A. Baker & Co., Ltd., 1,554 0 0 J. Okes & Co., 1,459 15 0 E. Bird & Co., 1,458 0 0 Phoenix Foundry Co., Ltd., 1,517 7 1 Hunt Brothers (Oldbury), Ltd., 1,512 10 0 Spener & Co., Ltd., 1,492 0 0 Railway and General Engineering Co., Ltd., 1,475 10 0 Clapham Brothers, Ltd., 1,463 2 6 Sheepbridge Coal and Iron Co., Ltd., 1,460 7 8 J. H. Hand & Sons, 1,445 9 5 Patent Shaft and Axle Tree Co., Ltd., 1,436 16 8 J. & R. Houston, Ltd., 1,431 0 0 Newton, Chambers, & Co., Ltd., 1,426 6 4 Holwell Iron Co., Ltd., 1,411 11 11 Whessoe Foundry Co., Ltd., 1,389 0 0 Ashmore, Benson, Peace, & Co., Ltd., 1,381 0 0 Horsley Co., Ltd., 1,375 4 5 British Hydraulic Foundry Co., Ltd., 1,365 9 6 J. W. Harrison, 1,343 8 2 A. Macintosh & Sons, Ltd., 1,296 5 1 H. Ballour & Co., Ltd., 1,263 19 5 F. Bradley, 1,252 1 1 S. Russell & Sons, Leicester*, 1,173 12 0

LONDON.—For the Levensham Borough Council, Mr. B. Van Putten, C.E., Surveyor, Town Hall, Catford, S.E.:— Kerbing and Tar-paving the Footpaths and Channelling and Making-up the Roadway of Brockley View. J. Mowlem & Co., Ltd., £1,888 0 0 & Sons, £1,241 0 0 B. Martin, 1,351 11 8 Fry Bros., 1,215 0 0 W. Pearce*, 1,210 0 0 Kerbing, Channelling, and Making-up the Roadway of Chadleigh-road. W. J. Logan, £240 0 0 B. Martin, £162 10 9 Fry Bros., 499 0 0 H. Woodham & F. Hoffmann, 487 16 4 Sons, 462 0 0 Harvey Bros., 489 5 4 W. Pearce*, 453 0 0 J. Mowlem & Co., Ltd., 466 0 0 Paving the Footways of Chadleigh-road with Artificial Chadleigh-road. W. J. Logan, £240 0 0 Harvey Bros., £191 6 8 F. Hoffmann, 207 13 4 Patent Victoria Fry Bros., 207 0 0 Stone Co., B. Martin, 203 0 0 Ltd., 185 0 0 J. Mowlem & Co., Ltd., 199 0 0 J. Ellis & Sons, Ltd., 180 13 7 Imperial Stone Co., Ltd., 199 0 0 W. Pearce, 180 0 0 Co., Ltd., 199 0 0 Empire Stone Co., 192 0 0 Sons, 192 0 0 Laying Paved Crossings, Kerb, and Channel in the Forest Hill District. W. Pearce, £1,847 8 0 H. Wood, 1,625 3 0 J. Mowlem & Sons, £1,509 14 1 1 Co., Ltd., 1,534 17 9 Harvey Bros., 1,425 4 10

LONDON.—For the erection of five blocks of dwellings proposed to be erected on the site of the Royal Caledonian Asylum in Caledonian-road, Islington, for the London County Council:—

J. Parsons	£43,217	Kirk & Randall	£39,765
W. Smith & Son	42,880	F. & T. Thorne	39,500
Prestige & Co.	42,115	Martin, Wells, & Co., Ltd.	39,382
Spencer, Santo, & Co.	41,779	Lawrance & Sons	38,584
F. & H. F. Higgs	41,490	Charles Wall, Ltd., H. L. Holloway	40,959
Holloway Bros. (London), Ltd.	40,000	Upernae-road, Chelsea, S.W.*	36,465

[The estimate comparable with the Tenders amounts to £41,004.]

LONDON.—For wiring and fittings for an electric light installation at the new fire station in course of erection at the junction of East and West Ferry roads, Isle of Dogs. For the London County Council:—

Donnison, Sillem, & Co.	£247 10	W. H. Johnson & Co.	£183 5
Tamplin & Makovski, Ltd.	245 0	Durrell & Co.	179 13
Oliver Clarke & Co.	220 0	A. H. Marshall & Co.	187 0
F. J. Coleby & Co.	197 0	Ward Bros., 28A, Basing-hall-street, E.C.*	140 0
National Electric Construction Co., Ltd.	184 0		

SETTLER.—For taking-up 1,100 yds. of old main sewers and altering and reforming same for the Rural District Council. Messrs. Barber, Hopkinson, & Co., engineers, Craven Bank-chambers, Keighley:—

Stold Bros. & Co., Contractors, Keighley*. £1,226 4 9

UCKFIELD.—For additions to the National School, for the Managers. Mr. J. Peckham, architect. Quantities by the architect:—

W. Burgess	£530	F. Waters & Son	£389
A. Chilton	500	C. Pelham	385
J. G. Pickard	485	B. Farrant, Uckfield*	364

WAKEFIELD.—For main pipe sewers at Walton and Alverthorpe, for the Rural District Council. Mr. F. Massie, engineer, Tetley House, Kirkgate, Wakefield:—

J. Armitage, Outwood, near Wakefield* £138 0 6

WAKEFIELD.—For erecting a porter's lodge, receiving wards, isolation wards, entrance gates, and new road, for the Guardians. Mr. J. Day, architect, 89, Kirkgate, Wakefield:—

Excavator, Bricklayer, etc.: J. Lockey, Wakefield	£1,858 3 0
Slater: J. W. Hingworth, Wakefield	97 19 8
Plasterers: W. Platts & Co., Wakefield	78 0 0
Carpenters: T. & M. Arundel, East Ardsley, Wakefield	522 2 3
Plumber: J. H. Wilson, Outwood, Wakefield	165 0 0
Electrical: Wakefield Electrical Engineering Co., Wakefield	58 0 0
Painters: Fleming & Born, Wakefield	17 10 0
Heating Engineer: J. Woodhead, Wakefield	415 0 0

WATFORD.—For extension of main sewers at Northwood, for the Rural District Council. Mr. E. Lalley, engineer, 9, Market-street, Watford:—

Clark Bros. £310

Frede & Sons £212

W. Judge 250

G. R. Mann 222

H. Brown 250

F. P. Bliss, Bushey* 205

Bracey & Clark 244

WINCOLMLEE.—For the erection of steel and iron work for cart sheds, for the Property Committee of Hull Corporation. Mr. J. H. Hirst, City Architect, Town Hall, Hull:—

E. F. Blakeley & Co., Liverpool £232

Subject to confirmation by the Council.

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WOKING.—For erecting public offices, Commercial-road, for the Urban District Council. Mr. O. J. Woolbridge, architect and surveyor, Bank-chambers, Woking:—

A. A. Cale	£4,848	Monks Pk. Portland Stone	£5,108
Ferguson & Co.	3,543		4,739
R. Wood	4,363		4,583
Mussellwhite & Sapp	4,352		4,600
C. Wall, Ltd.	4,297		4,385
S. Ellis	4,217		4,477
Higgs & Onthwaite	4,214		4,357
Martin, Wells, & Co.	4,200		4,450
E. Chamberlain	4,145		4,315
Cronley Bros.	4,099		4,274
J. Harris & Son	4,094		4,373
Shelbourne & Co.	4,013		4,155
J. & N. Patrick	4,003		4,189
Browley & Co., Woking*	3,979		4,262
E. C. Hughes	3,943		4,159

WOKINGHAM (Berks).—For erecting new school, for the Berkshire Education Committee. Mr. F. C. Pinks, architect, Parliament-mansions, Victoria-street, London, S.W.:—

H. W. Godwin	£7,417 9 10	E. Chamberlain	£6,257 0 0
S. Orchard & Son	7,337 0 0	P. Newbury	6,214 2 6
J. Ferguson & Co.	6,987 10 0	G. Brown	6,156 0 0
Mitchell Bros.	6,519 0 0	J. B. Seward	6,130 0 0
C. W. Cox & Sons	6,445 0 0	E. A. Roome & Co.	6,116 0 0
T. Stimson & Sons	6,438 2 3	East & Hyde	6,076 0 0
S. Lewis & Son	6,422 0 0	Martin, Wells & Co., Ltd.	6,000 0 0
H. Charman	6,414 0 0	A. Faulks	5,997 2 2
Poster Bros.	6,404 0 0	G. H. Gibson	5,994 0 0
S. Ellis	6,371 0 0	W. E. Wallis	5,984 0 0
T. G. Messom & Sons	6,370 0 0	H. Elliot	5,726 0 0
		E. C. Hughes	5,697 0 0
		M. E. Pitt	5,640 0 0
		W. Watson, Ascot*	5,595 0 0

WOODVILLE (near Burton-on-Trent).—For the erection of a churchroom in connexion with the Parish Church of St. Stephen. Mr. W. N. Richards, architect, Woodville:—

Ford & Co.	£1,396 0 0	E. Clarke, road, Woodville*	£1,210 0 0
Low & Sons	1,324 0 0	S. T. Pish	1,192 10 0
G. Godfrey	1,322 0 0		
T. Pearce	1,268 8 6		
Cartwright Bros.	1,255 0 0		

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1. Front Elevation.	
2. Section and End Elevations.	
House at Munstead (two views).....	Mr. E. W. Mountford, F.R.I.B.A., Architect.
O'Growney Memorial Tomb, Maynooth.....	Mr. W. A. Scott, A.R.I.B.A., Architect.
Wesleyan Church and Schools, Middleton.....	Mr. Edgar Wood, A.R.I.B.A., Architect.

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The Church of St. Germans, Cornwall.



HERE is no church in Cornwall that can compare with that of St. Germans in the richness of its historical and ecclesiastical associations; and there are few, if

any, that can rival the interest and variety of its architecture or the beauty of its situation.

In order to understand the nature of the fabric that now survives of a church that was at once conventual and parochial, it is imperative that a bare outline of its history should be given.

In the earliest pre-Norman period of existence the church of St. Germans is a collegiate foundation, served by a community of secular clergy or canons. It was founded in honour of St. German, who became Bishop of Auxerre, in France, in the year 425. He came over to Britain to oppose the Pelagian heresy, and his fame as a defender of the orthodox faith is still kept green. He travelled throughout England, Wales, and Scotland. Bishop German has left traces of his active missionary work on the maps of both Great Britain and the Continent, but nowhere with greater emphasis than on this widespread parish south-east Cornwall. There seems no reason to doubt that the tradition of his having made this place a centre of his st country preaching rests on a sound foundation.

Whether there was any earlier establishment of a bishopric for Cornwall than that which is known to have a historical existence in the IXth century is a matter of some doubt; but that St. Germans was the seat of the see of Cornwall at that period is an ascertained fact. Conan was bishop here in 931, and his sixth successor in the bishopric of St. Germans was Lyfing, who died in 1046. After that date Cornwall became united with the see of Devon, and remained so to our own times. A body of canons held half of the large parish of St. Germans at the time of the Domesday Survey in 1087. Of the church that they served, which was doubtless of considerable size, no part is still standing, so thorough was the rebuilding in Norman days. It is generally said that there are certainly no traces of it left above-ground. But this is not quite correct. In two or three places in the interior of the present church hewn stones have been noticed dressed in the pre-Norman manner, after a chevron fashion, which speak plainly of the subsequent use of Saxon material. Moreover, various squared stones dislodged during repairs of the current year (1904) showed clear traces of mortar adhering of an earlier date than when again placed in position by Norman masons. So that the skilled antiquarian eye would feel confidence as to the existence of a stone pre-Norman fabric on this site apart from all records.

The canons continued to serve this church until the episcopate of Bishop Bartholomew, of Exeter (1161-1184), in whose days they were suppressed for

irregular life and worldliness. The Bishop, in a charter yet extant, converted this church and its adjacent collegiate buildings into a priory of canons-regular of the order of St. Augustine. The Bishop died in 1184, before the transference to the Austin canons was fully completed, but we know that it was accomplished before the year 1190.

The new prior and his canons were not likely to be content with the old church and buildings, which were probably by that time, owing to the careless life of their predecessors, in considerable decay. From the genuine though late Norman character of much of the work now remaining at St. Germans, it is obvious that energetic rebuilding must have been at once undertaken by the new establishment.

The fabric of the church as it now stands consists of chancel and nave (in continuous line), south aisle, a quasi north transept and chapel, south-west porch, and two western towers. The interior length of the nave and chancel is 102 ft., and its width 23 ft. The south aisle is 25 ft. wide, narrowing by about 5 ft. in the two most eastern bays, that are level with the quasi-chancel. The interior width at the west end between the two towers is 61 ft.

Interesting and beautiful as are the remains of what must once have been a remarkably fine late Norman church, it is sad to think how much it has suffered, not only at the time of the dissolution of the monasteries, but even within the last hundred years.

In the Cornwall volume, of "Beauties

of England," published in 1801, the north aisle is described as "divided from the nave by five short, thick, round columns, each connected with a half-pillar opposite to it in the north wall by a low surbared arch; all the capitals of the columns are square, and curiously ornamented with Saxon (*i.e.*, Norman) sculpture. . . . Above these range six plain arches, some of them apparently of the same age and style with those in the nave of St. Alban's Abbey Church, Hertfordshire." Two years after this account was published the north side of the nave was said to be in a perilous condition, and so, to save the expense of proper repair, the whole of this good Norman arcade work and vaulted north aisle were swept away and the present north wall of the nave run up in its place. Parts of the piers and other Norman moulded fragments can be detected in the masonry. The traces at the west end of the present south aisle show conclusively that the nave aisle on that side of the church exactly corresponded with the north aisle. A paper of the Exeter Diocesan Architectural Society, read in 1848, mentions that at that date the lines of the lean-to roofs of both aisles could be clearly seen on the eastern faces of both the towers. Some singularly fine Norman clearstory windows, of considerable size and richly ornamented with zigzag mouldings, have been recently brought to light, during a repointing scheme, above the western part of the south arcade, two pillars and a respond of which are still of the original Norman design.

Careful examination seems to show that the Norman scheme was a nave of five bays, for parochial use (exclusive of the western bay between the two engaged towers), the most eastern bay being intended for the beginning of the conventual quire when the time came for rebuilding the Saxon chancel. There is no trace left of any transepts, which were probably left for later development; and a substantial screen would at that time cut off the parochial nave—necessarily large for the largest parish in Cornwall—from the canon's quire at the first piers from the east end of the new Norman structure.

The west front of the nave between the two towers and the basements of the two towers are of late but definite Norman work. Below the central gable are three large Norman lights, the one in the middle being the highest. Below these are two smaller lights, the inner angles of the bases of which are cut off by the steep-pitched roof of the projecting western doorway or portico, thus substantiating the idea that this singularly fine and enriched doorway was an afterthought, or, at all events, executed at a slightly later date. The width of this noble portico is 20 ft.; the actual door space is but 6 ft., and the remainder is occupied by the four shafts, alternating with zigzag or chevron mouldings. The arch is of seven orders; the two innermost are merely round, the third and fourth have the zigzag ornament, the fifth is rounded, and the sixth and seventh are also sculptured with the zigzag. The height of the doorway is 10 ft., and of the whole archway 16 ft. The outer arch is surmounted by a hood-

mould having head terminals, and much enriched with foliage, etc. Above the arch is a pediment surmounted by a four-nosed cross. The erection of the towers that flank this western portal was not continued until the Transition from the Norman was in vogue, *circa* 1200, and one of them seems to have remained uncompleted for some time.

Though there was no interference with the actual nave of the church in the Early English or First Pointed style, it is known from the remains still to be seen in the interior of the Earl of St. Germans' house, to the immediate south of the church, that the cloisters and refectory of the conventual buildings were rebuilt in the time of Henry III.

The towers are somewhat puzzling. Probably the two lower stages of each were finished about the same Transition date. This level is about the same as that of the nave roof, and here they most likely ended, being crowned with pyramidal tops. The additional octagonal story of the north-west tower has plain pointed lancets on each face, and clearly points to Early English work, probably about 1250-60, and, if so, of the like date with the rebuilding of the quire. The embattled summit is, of course, of later date, and the upper masonry shows pretty clear traces of having been then somewhat raised. The south-west tower is distinctly Norman in its basement stage, but the remainder has been a good deal altered as well as raised at later dates.

The arches under these towers, opening into the church to the east and on each side, are quite plain and supported on bold, clustered columns.

On the south side of the nave, at the west end, are the two remaining Norman piers, short, circular, and with cushioned capitals; but they now support pointed arches.

An entry in Bishop Bronescombe's register at Exeter states that he dedicated the conventual church (*conventualem ecclesiam*) of St. Germans on August 28, 1261. It is quite clear that this means that a new and extended quire for the canons was at that date consecrated. The nave of a church might be altered and extended, or new chapels added to a chancel, without any episcopal dedication being required, but when the site of the high altar was changed canonical law made fresh consecration obligatory.

The comparatively narrow Norman aisle on the south side of the nave was taken down at two different periods for the purpose of enlargement. The town of St. Germans stood on the south side of the church, whilst the conventual buildings were on the north side, the north aisle of the nave forming one side of the canons' cloister. The Bishops of Exeter had a residence not far from the priory, several families of distinction had manor and other houses in this widespread parish in the XIVth century, and greater church accommodation became necessary. The first alteration was the substitution of a south chapel 22 ft. wide in the three eastern bays of the 10-ft. wide Norman south aisle. This chapel, still very beautiful, must have been of singular perfection when first built. The east end is most unusual. There are two three-light windows with excellent though

slightly different tracery, and between them is a handsome recess for a life-size image, with crocketed canopy. There is a third two-light smaller pointed window high up in the apex of this east wall; but we know from Whitaker's history of this church, published in 1804, that it is comparatively modern, having been constructed by Lord Eliot, a little before Whitaker's time, from remains found in the quire ruins. On the south side of this chapel one of the original windows remains, the window to the east of it having been destroyed to make room for the great costly group of marble sculpture by Rysbrack, with the effigies of Edward Eliot, 1722, and his two wives, which now stands under the north-west tower. There is a single sedile of fine and perfect design to the south of the altar, and when the cumbersome marble monument was removed a lofty canopied recess was found under an ogee arch. The work of this recess had been cruelly hacked away to make room for the cumbersome monument, but enough remains to show that it was originally of exquisite workmanship.

Where work of such exceptional beauty is found, it becomes at once highly probable that there was some additional reason for the construction of such a chapel other than that of greater space. The annals of the church at once supply the cause in a remarkable incident that exactly corresponds with the period that architectural experts would assign to this chapel.

On the death of Prior Polgoner in 1355, John Precheur, the sub-prior, succeeded as superior. During his rule the priory became enriched with relics of the Saint whose name it bore. Sir Nicholas Tamorze, Kt., succeeded in obtaining from the abbot and convent of St. Germain of Auxerre a portion of the relics they possessed. A small bone of the arm and a portion of the shroud in which the body of St. Germain rested were given to the knight, who placed them in a silver-gilt reliquary and brought them across the sea to Bishop Grandisson, by whom they were conveyed to the priory of St. Germans, where provision had been made for their honourable keeping. The grant from the Abhey was made in March, 1358. On May 20, 1361, the Bishop granted a forty days' indulgence to all penitents who should make a pilgrimage to the shrine at St. Germans, or visit it at any time for the sake of devotion. There can be no reasonable doubt that this chapel was built at this period for the special reception of these relics, and that an amhray for their safe enclosure was placed within the canopied recess to the south of the altar. The image niche between the two windows would doubtless hold a statue of St. Germain. This niche has quite recently been filled with a statue of Our Lord as the Good Shepherd. If it was to be filled, it seems a pity that a figure of the great missionary Saint was not once again placed in the position designed to perpetuate his memory.

About a century later the western end of this chapel, which projected beyond the rest of the narrow aisle, was taken down and a wide south aisle was continued right up to the south-west tower, and four four-light large pointed windows

inserted in the south wall, one in each bay. The upper tracery of the three easternmost of these windows, though slightly different in each case, is of the kind known as fairly advanced "Perpendicular"; but the one nearest the tower has reticulated tracery and would generally be termed "Decorated." There is no necessity, however, to state that therefore the work of widening the whole aisle began at the west end, and was there interrupted for "at least fifty years." Close examination of the general masonry and of the jambs and hood-moulds, etc., shows that the work is all of the same date. One style was never quite driven out at a given date by its successor, and quatrefoil tracery not infrequently lingered on side by side with the later stiffer treatment well on into the XVth century. This is a fact which can not infrequently be proved in Norfolk churches. The terminals of the hood-moulds of these windows all bear heraldic and other devices. The arms of Bishop Lacy (1420-1450) are plainly discernible, and this yields the date of this effective aisle widening.

When the Norman aisle was thus widened, a south doorway in its western bay was taken out, and preserved as the west doorway at the end of the aisle. At the same time a charming little porch with an elaborately groined roof was built against the south wall of the south tower, forming a covered entrance to the aisle. This portico has doorways both on the south side and at its west end. The latter is a heavy doorway with spandrels, *circa* 1500. Of the same date is the blocked-up doorway under the easternmost window of the widened aisle. When the St. German relics chapel was erected in the XIVth century it would certainly have its own doorway in the projecting part of its western wall; and when the time came for the extension of the whole aisle a doorway would be transferred to the south wall. Such a doorway would doubtless be much used by pilgrims to the shrine—there would be crowds on the two festival days of St. German, July 31, his death day, and October 1, his translation; it seems to have been rebuilt on a wider scale, *circa* 1500, together with the west doorway of the porch. The pilgrims would enter by one of these doorways and depart through the other. It must not be supposed that the south aisle was the site of the parish altar; this would almost certainly be at the east end of the nave, and the ordinary parish entrance would be through the main west doorway. The year 1500 is said to be the exact date when the nave was re-roofed.

After the priory was dissolved, in 1539, the quire of the canons naturally fell into decay. The Champenowne family, to whom Henry VIII. granted the priory, used much of the walls in their adaption of the conventual buildings as a residence, and they actually built up a brew-house on the site of the high altar. This brew-house was standing in 1804, when Whitaker took some measurements. He found that the quire was the same width as the nave and extended eastward 55 ft. The parishioners, in adapting the nave for their use when the canons had gone, happily decided to move the great window from the east end of the quire

to a like position at the east end of the nave. It is a fine five-light window measuring about 35 ft. high by 20 ft. broad, and has a transom. The upper tracery forms a kind of crown. It clearly dates from the dawn of the Perpendicular period, and may safely be assigned to the reign of Richard II.

Carew, in his "Survey of Cornwall," printed in 1602, says of St. Germans Church:—"A great part of whose chauncell, anno 1592, fel suddenly downe, upon a Friday, very shortly after public service was ended, which heavenly favour, of so little respice, saved many persons lives, with whom immediately before it had been stuffed; and the devout charges of the well-disposed parishioners quickly repayed this ruine." This oft-cited statement has been hastily assumed to mean the downfall of the conventional quire; but it means nothing of the kind. We happen to know that the old quire was stripped of its lead almost immediately after the surrender of 1539, when the owners saw fit to turn much of it into a brew-house. That which fell in 1592 would be parts of the roof and very likely of the east wall of the nave that had been too hastily built up by the parishioners some fifty years previously to make themselves a chancel. When the north aisle was cleared away, in 1803, the scheme included the building of a kind of chapel or north transept for the Port Eliot pew, with a corridor leading to it. This paw has since been turned into an organ chamber, and the corridor into a vestry.

Considerable restoration schemes were carried out, at a large outlay, under the late Mr. Piers St. Aubyn, between 1887 and 1897. Repointing of the interior and many general repairs have been executed during the current year (1904). During the work a blocked-up niche for a holy-water stoup and a piscina niche have been uncovered in the south aisle.

The most interesting detail of the interior is the fine late Norman font, which was broken up and discarded in 1793. The fragments were, however, replaced and found to be almost perfect in 1840. The font is 33 in. square, and stands 39 in. high, and is of dark marble. In the four angles round the bowl at the top of the font are three three-leaved ornaments in slight relief and a circle or ring in the fourth angle. The north side of the bowl is carved with a round-headed arcade, and the other sides have much-worn patters; it stands on a central and four subsidiary shafts.

In the south aisle is a small, somewhat rudely-carved miserere stall or seat, which has been clumsily repaired. A good deal has been written and said about "the extraordinary antiquity" of this piece of church furniture, and one antiquary of recent times has described it as "a penitential sedile with a carved record of the trespass thereon." The misericorde itself is carved with the figure of a sportsman carrying a couple of rabbits and surrounded by dogs. The subject is locally known as "Dando and his dogs," as to whom there are some amusing childish tales. But, after all, the date of this carving cannot be older than late XIVth century, and hunting subjects are quite common in such positions: It is quite clear that it originally formed one of a set of small stalls.

Another interesting fragment is a piece of the XVth century rood screen. Part of the stairway to this screen may now be noticed in the south aisle.

There is some beautiful modern glass of Burne-Jones design and Morris execution in the large east window, and other fine figures in the debased six-light window of the south chapel.

The large west doors have recently been ornamented, with very questionable taste, by Byzantine-looking patches of bronze work and a great closing ring of like style. The metal workmanship looks to be well done, but is quite out of keeping in such a place. Moreover, the would-be hinges are mere shams, and have no connexion with the eyes of the staples.

Much money and care has evidently been spent on this interesting fabric during recent years, but the strongly-marked new pointing of the interior can scarcely be regarded as an improvement. The ivy needs to be speedily checked on the north-west tower.

Considering the number of old families that were for so long a period settled in this wide parish, the church is singularly barren of monuments of special note or antiquity. The oldest that bears any inscription is to the memory of John Glanville, second son of Nicholas Glanville, an ancient family long resident at Tavistock. The Glanvilles, of Catefrench, in this parish, held the great tithes of St. Germans for nearly three centuries, the lease having only run out in recent years. This John Glanville, born in 1599, married at the age of 15, and at his ordination was presented to the rectory of Withell, Cornwall; he died in 1631. At the head of this mural monument are the arms of Glanville (three crosses saltire, with a crescent for difference) impaling the old Norman coat of Glanville (a chief indented). This is a freak in heraldry; the impaled coat has no connexion with his wife, who was a daughter of the Rev. Jacob Pulston. Below the arms, which are flanked with the birth and death dates, appears the following remarkable and peculiarly ingenious Latin acrostic. The initial letter of each line yields "Johannes," the middle letter "Glanvill," whilst the terminal letters form the word "minister."

I	nditur in gelidum	G	regis hujus opit' bustu	M
O	nibus irriguus	L	acrynis, simul urbis et agr	L
H	ujus erit vivax,	A	que indecible nomen	N
A	rtibus et linguis,	S	enon virtute probat	I
N	obis ille nove	V	atem (pro numero) legi	S
N	aviter et graviter,	I	ucunde et suaviter, egi	T
E	rgo relanguenti	L	ict eluctatur ab or	E
S	piritus; aeternum	L	ucubit totus, ut aste	R

There are various later monuments to the Glanville family.

In the chapel on the north side of the church is the table-tomb of John Moyle, who died in 1661, aged 72. The arms of Moyle, which are a mule passant (an instance of canting heraldry), impaling those of Prideaux, are sculptured with much precision and care. There is a long Latin inscription to John Moyle, of Bake; he was sheriff of Cornwall in 1624. A floor slab close by bears an inscription to his wife, who bore the remarkable Christian name of "Admonition"; she was daughter of Sir Edmund Prideaux, Bart. Another much-worn stone commemorates their second son, Sir Walter Moyle, Kt., 1701.

The earliest monument to the St. Germans family is a floor-stone to Ann, relict of William Eliot, Esq., 1723.

RAILWAY FOG SIGNALLING.

ALL railway passengers are at one in thinking that the employment of detonators, lamps, and flags constitutes a very obsolete system of fog signalling. Railway engineers are, doubtless, of the same opinion, but, having always before them the safety of the travelling public, they will make no sweeping change until a perfect substitute has been found. Numerous inventors have patented the only rational system of fog signalling apparatus, and each invention is better than all the others—individually or collectively. If all these inventors had agreed upon an identical device things would be more simple, and the railway companies might easily be convinced. As matters stand, there are too many systems to choose from. And it is of no use to satisfy one company; all the railway companies must be satisfied. Except for purely local purposes, the system selected must be universally approved and adopted. Past experience in connexion with brakes and couplings shows that such a result can scarcely be expected save by compulsory legislation, which is not a hopeful alternative.

In a recent article we mentioned the electrical method of signalling on the Great Northern and City Railway. This, however, is not suitable for fog signalling on complicated portions of a railway system, although giving every satisfaction on a short electric railway. Another device, patented by Mr. W. Brierley, has been favourably spoken of by Colonel Yorke, and tried by the Great Northern Railway, with results that are said to be satisfactory as far as they go. The invention is mechanical in character, and involves the use of a "rocker" fixed on the permanent way and capable of being set at "danger" or "all right" from the nearest signal box. Assuming the apparatus to be in perfect order, one of these signals must be communicated to every passing train by one of two "triggers" attached to the engine, and the signal can be repeated by bell, whistle, or dial in the cab of the engine. The rocker and the two triggers are returned to the normal position by means of spiral springs. In our opinion the chief objection to this apparatus is that injury might result from the tremendous shock due to the impact of the trigger attached to a heavy train travelling at fifty or sixty miles an hour; and even admitting all the parts to be so balanced and adjusted that the force is taken up by the springs, any of these springs might fail at an early period in its existence through the development of some unsuspected flaw, or owing to the brittleness arising from frequent repetitions of stress. But there are numerous requirements to be fulfilled by any automatic or semi-automatic system of fog signalling. Among the foremost of these are:—Certain action, simple construction, slow deterioration, protection from damage, easy replacement of damaged parts, minimum attention, applicability for starting, differentiation

between home and distance signals, repetition in the signal box, a clearing signal given from the tail of the train, failure of action to give "danger" signal in the engine cab, and the apparatus to be unaffected by weather.

A form of apparatus which, it is claimed, complies with all these conditions is employed in the system of magnetic signalling without contact, patented by Mr. W. S. Boulton, and tried four or five years ago with successful results on the Great Northern Railway. This method avoids the disadvantages inseparable from mechanical contact; but, while appearing to have everything in its favour, has failed to secure the universal approval of railway engineers, except perhaps in a purely academic sense.

We do not for a moment believe that the problem of fog signalling is really difficult of satisfactory solution. If the chief railway companies could only agree among themselves to appoint a joint committee of experts it is probable that a thoroughly workable and reliable system could be devised or adapted within a few weeks or months. But the trouble is that the companies seem to have no desire for joint action. Each company prefers to hang back, waiting to see what the others will do.

NOTES.

The Sussex Building Case. THE proceedings taken by the Chailey Rural Council against Sir William Grantham have followed a course which is not of general importance to the public. The question seems to have resolved itself into one of fact as to whether the plans submitted were sufficiently intelligible and in compliance with the by-laws in force in the district. The magistrates, in coming to their so-called "finding," appear to have lost themselves, and the defendant has been neither convicted nor acquitted, nor does the verdict even comply with that known in Scotch law as "not proven." We have heard of decisions which amount to "not guilty, but don't do it again," and this would appear to be the verdict of the learned magistrates of the Lewes Petty Sessions. It is not a satisfactory conclusion, but it is perhaps the only one that was possible to the magistrates. The real questions are whether the by-laws affecting rural buildings are unreasonable in their operation, and whether the officials who have to enforce them are competent for their task. On the latter point there is no certain evidence, and probably the condition of things in this respect varies very much in different districts. On the former point the magistrates could scarcely have been expected to pronounce a decision; it would have been *ultra vires* for them to do so, and it is in any case a matter requiring very careful consideration. We certainly cannot recommend that building by-laws should be abrogated in the case of rural cottages; they should be simplified and confined to matters really affecting the healthfulness of a habitation; but it cannot be permitted that landlords, because they are willing to build cottages for their tenants, should be allowed to build just as they please; the results might be very injurious. The case under special con-

sideration is not so one-sided as writers in popular prints appear to think. The plans by Sir W. Grantham which we have seen published do not by any means lead us to think that he should be trusted to build cottages without supervision by the authorities. The case has been made the occasion, in fact, for a popular outcry which is by no means altogether reasonable, and is set up by people who do not know much about building or sanitation.

Labour and Trades Unions. THE reports of the Board of Trade show continued depression in the labour market affecting nearly every class of employment, yet there is a satisfactory decrease in labour disputes, the number of workpeople affected in November being about 13,000 fewer than in November of last year. The memorandum of the Board of Trade as to the position of Trades Unions in the year 1903 contains matter of considerable interest in view of the above facts. Despite a small decrease in membership the funds of the principal Unions attained a record amount, viz., 4,550,000*l.*, and this satisfactory state of affairs is attributed to the fact that last year there were so few disputes that only 170,000*l.* was expended on strike pay. This gives a percentage of only ten per cent. for strike pay, whilst the amounts expended in directly benefiting the workpeople was sixty-eight per cent. The twelve years, 1892-1903, give an average of eighteen per cent. strike pay. To what causes may this reduction in trades disputes be reasonably traced at a time of commercial depression usually so conducive to strikes? The only answer appears to be that it must be attributed to the salutary construction which has been placed on the law affecting Trades Unions, and it is to be hoped that the natural common sense of the working man may prevail against the Councils of the agitators, and that the above figures may show him how much it is to his own interests that the funds of the Trades Unions should be devoted to his direct benefit and not be frittered away in strike pay, and litigation, and agitators' expenses.

Construction of a Building Contract. THE case of *Robins v. Goddard*, in which a somewhat novel construction was placed by Mr. Justice Farwell upon a building contract in the form sanctioned by the Royal Institute of British Architects, and which was commented upon by us recently, has been carried to the Court of Appeal, where the decision has been reversed. The action was brought by the builder claiming sums due to him under the contract as certified by the architect, and the defendant counter-claimed in respect of defective work and materials. Clause 17 of the contract gave the architect power to order defective work to be made good, and Mr. Justice Farwell considered this clause excluded the jurisdiction of the Court over the counter-claim in the absence of any such order in the architect's final certificate. The Court of Appeal have, however, pointed out that under this contract this was not the exclusive remedy, since clause 32 contained an arbitration clause which also was applicable

to the matter in dispute. It is further to be observed that clause 30 specially provided that "No certificate of the architect shall be conclusive evidence as to the sufficiency of any work or materials to which it relates, nor shall it relieve the contractor from his liability to make good all defects as provided by this agreement." Mr. Justice Farwell so read this clause that he substituted for the word "nor" the words "so as to relieve, etc." and the Court of Appeal also dissented from this construction. In the result, therefore, the final certificate given by the architect was held not to be conclusive of the matters in dispute, and the order of the Court was that they should be referred to a referee to be agreed upon by the parties.

Electrification of the Underground Railways. WITH the exception of the new line between Harrow and Uxbridge, there is little indication of electric traction on the Metropolitan Railway, but we understand that the Baker-street and Harrow section will be thrown open to electric traffic early next week. This will give the public an electrically operated train service from Baker-street to Uxbridge, although steam locomotives will not be entirely abolished until a later date. Satisfactory progress continues in the equipment of the great generating stations of the two underground companies at Neasden and Chelsea and upon the distribution systems of the respective lines. At the present time it is impossible to say when the final act in the conversion of the inner circle may be expected. It is satisfactory to learn, however, that a complete understanding has been effected between the Metropolitan and the District companies as to the interchange of current for the purposes of operation. In the cars about to be employed on the Metropolitan line Londoners will find a fair sample of what may be looked for on the inner circle. The cars are on the corridor system, excellently lighted, and provided with electric heaters, and, more important still, no inflammable material has been employed in their construction.

Tramways and Municipalities. THE decision in the case of The London, Deptford, and Greenwich Tramways Co. and the London County Council is one which will surprise no one. The Tramway Company, which had acquired its Parliamentary powers at a time when no liability was incurred by such undertakings to bear some portion of street widening, in an arbitration to ascertain the value of the tramway for compulsory sale to the County Council claimed some 22,000*l.* on the ground of this immunity. This claim was disallowed, and indeed it seems more remote than even "moral and intellectual damages." The case, however, does serve to draw attention once more to the fact that it is to the interests of the ratepayers that such undertakings should be undertaken by private companies and not by corporations. In the former case the ratepayers are relieved at once of one-third of the cost of road widening, and as we pointed out in the case of the London United Tramway in an extension of only some seven or eight miles, this company

had to expend some 200,000*l.* on public improvements, and this system is, moreover, not confined to the jurisdiction of one corporation.

The Isle of Wight Coast. SINCE the publication of our last "Note" on this subject, further anxiety has been caused to the inhabitants of Freshwater owing to the action of unusually high tides and heavy seas. On Dec. 9 an Emergency Committee of the Isle of Wight Rural District Council visited Freshwater, and were much impressed with the serious damage done by recent storms. They had good reason for solicitude, for an enormous mass of concrete has been torn away from the sea wall, and so large a gap has been made in the esplanade as to imperil the foundations of various buildings. Still, so far as we are aware, no action has resulted from the visit of this Committee. On Dec. 22, however, a letter was received from the Local Government Board, goaded into action by an urgent representation from the Freshwater Parish Council, asking what the District Council were doing with respect to the question of protecting the threatened shore. This letter has produced some effect, for after discussion it was decided to take preliminary steps for carrying out the recommendation of the surveyor to the Hampshire County Council that the main road running along Freshwater Bay should be raised several feet, and protected by a substantial sloping wall. But we observe with regret that the Council merely propose "preliminary steps," and, as the County Council are to be asked to bear the cost of the works, it is much to be feared that the decision is merely intended to satisfy the Local Government Board, and that no serious attempt will be made to protect the coast unless the County Council are willing to provide the money. So far as can be judged by their past tactics the District Council would rather let the whole island be washed away than spend a penny on defensive works.

A Novel Lock for Canals. THE ingenuity of French engineering is well illustrated by the tilting lock-chamber invented by M. Cardot, of Paris. This device is intended for raising or lowering a barge or other vessel without the necessity for wasting any water. Below the upper lock gate of the canal a masonry chamber is constructed so as to be always in communication with the lower reach of the canal. The bottom of the chamber slopes from each end up to a ridge not far from the upper end, and on this ridge is pivoted the tilting chamber, formed with two walls of steel plate, water being held in the inner compartment, and air in the outer. In one position of the chamber a barge can enter through gates in the end, and when these gates have been closed the chamber can be filled by means of a heavy weight running along the bottom of the air compartment, the weight being moved by means of a wire cable and a suitable crab. When the chamber has been tilted, the water in the inner compartment is at the level of the water in the upper reach of the canal, and the barge can pass out through gates like those by which it entered. The reverse operation is conducted in

a similar way. A device of this kind might be useful in connexion with canals where traffic is liable to interruption owing to severe droughts, or where traffic requirements involve undesirably heavy expenditure by necessitating the use of more water than is essential for preventing stagnation.

Aqueducts. A PAPER on "Aqueducts, their Location and Survey," read before the Manchester University Engineering Society by Mr. A. H. Jameson, possesses considerable interest to those engaged in work of the kind considered by the author. After dealing with various methods of constructing water conduits, and discussing overflow weirs, washouts, automatic closing valves, and other details, Mr. Jameson described the method of surveying for a modern aqueduct, taking as an example that of the Derwent Valley Waterworks. The survey for that undertaking was evidently executed with the greatest care and a high degree of accuracy. For a great part of the distance the line ran over hilly country, and to facilitate correct linear measurements a steel tape was employed in place of the ordinary chain, the tape being adjusted horizontally by means of a spirit level. As the average gradient of the aqueduct was little more than 12 in. in a mile, it was necessary to be most particular with levelling and contouring work. Hence a circular spirit level was attached to the staff for the purpose of assisting the operator to adjust it in a perfectly vertical position, a device now generally adopted for accurate work. It is well known by surveyors that ordnance benchmarks can by no means be accepted as infallible guides, a view further confirmed by the experience of Mr. Jameson during the Derwent Valley survey. A noteworthy point made by the author was that the extreme accuracy of this survey resulted in the saving of some thousands of pounds in the actual construction of the aqueduct.

Steel at High Temperatures. THE results of some interesting tests by Professor Bach, of Stuttgart, of the strength of steel at high temperatures have recently been made public. In one set of experiments some of the bars were subjected to tensile tests at ordinary temperatures, and others at temperatures ranging from 200 deg. to 550 deg. C. From the results it became evident that strength had increased up to 300 deg. C., thenceforward falling approximately in proportion to the temperature to about half the original value. The ultimate extension at 200 deg. C. was less than one-third of the value at normal temperature, but at 550 deg. it was over fifty per cent. higher than the normal value. The contraction of area was reduced at 200 deg., but began to increase after the temperature of 300 deg. had been passed. Another series of bars tested were heated and kept under load for considerable periods, with the result that at 300 deg. C. a slight diminution of strength was observed, and more marked diminution at 400 deg. and 500 deg. C. At the same time it was noticed that the extension, and the contraction of area, increased between 300 and 400 deg. C., and decreased beyond 400 deg. until at 500 deg. C. the

average values were about 22 per cent. lower than those obtained by tests of the usual duration. The second set of experiments here mentioned indicates that for steel intended to be used at high temperatures, as in the case of steam boilers, for instance, it would be wise to insist upon the conduct of commercial tests at corresponding temperatures. An additional reason for the adoption of this course is to be found in the brittleness observed by Professor Martens and other investigators in steel at temperatures above 300 deg. C.

In a letter to the *Times*, published last Friday, Sir Oliver Lodge states that he is prepared to show to a deputation of municipal or other engineers the apparatus which he has invented for dispelling fogs. A description of the method he adopts will be found in patent No. 24,305 of 1903 which is entitled "Improvements in means for the production of continuous high potential electrical discharges applicable for the deposition of dust, fume, smoke, fog, and mist, for the production of rain and for other purposes." The principal claims made by Sir Oliver Lodge in his patent are in connexion with commercial methods of causing small particles in the atmosphere to coalesce into larger ones by means of high pressure electrical discharges from points. The larger particles fall by their own weight and so clear the atmosphere. The method is an extension of a discovery made by Mr. John Aitken, of Edinburgh, in 1880. He found that neither a cloud nor a mist globule could form without some solid basis as centre, so that in perfectly clear and dust-free air neither could mists form nor vapour condense. Every cloud or mist globule is slowly falling; if we make these globules coalesce, then the velocity of falling will become appreciable and the cloud or mist will soon be dispersed. C. T. R. Wilson, of Cambridge, discovered that condensation of vapour in dust-free air could be produced by Röntgen rays, each "ion" of electricity forming a condensation centre. If we produce, therefore, ions artificially on a large scale, the globules of water that are in the air will gradually increase in size and new globules will form round the ions. In addition, the electrification diminishes the surface tension of the water, and so the globules coalesce readily. This can be shown easily by rubbing a stick of sealing wax with flannel and holding it near a thin jet of water. The drops run together in a remarkable manner when the wax is held within two or three feet of them. We think that Sir Oliver Lodge's apparatus might be set up with advantage in the neighbourhood of Trafalgar-square, for example. The unsightly portion of it could be wheeled away, like the gas flares, when not required. We know that his apparatus has been successful over a space of about fifty yards in radius both at Liverpool and Birmingham, and if an equal area of London fog could be dispersed by the same means it would prove more economical than trying to illuminate it.

The Efficiency of Nozzles. DURING the last quarter of a century much has been done to increase the efficiency of nozzles such as are used for fire and power purposes. The most recent series of

experiments was conducted by Mr. H. C. Crowell and Mr. G. C. D. Lenth at the Civil Engineering Department of the Massachusetts Institute of Technology, Boston, for the purpose of determining the efficiency of the Doble nozzle. The characteristic features of the nozzle are the tip and the needle regulator within it. The latter, having the shape of a plumb-bob, is attached to a steel spindle provided with a hand-wheel for regulation. At the commencement the attention of the authors was at once directed to the clear and polished stream of water issuing from the jet and to the absence of all spraying near the tip, as compared with the feathery appearance of the stream from an ordinary fire nozzle. To find the reason for this was the first subject of investigation. After various experiments, it was concluded that the feathered appearance of the stream from an ordinary nozzle is due to the difference in the velocity of the particles of water, and that the amount of retardation of velocity of the outer layers determines the degree of feathered appearance. Inquiry was next made into the distribution of velocity in jets, and we notice that the most marked characteristic of all the velocity curves for the Doble nozzle is that the maximum velocity in the stream occurs quite close to the edge. Another remarkable feature is the high velocity in the centre of the jet from the same nozzle, even within half an inch from the needle. Notwithstanding variations of the centre velocity due to different settings of the needle, the velocity of the exterior particles of water changed almost imperceptibly, and the jet maintained its smooth, glassy appearance for a long distance from the nozzle. Twenty experiments were made to determine the efficiency of the jet under different conditions of head and setting, and, rejecting one or two doubtful results, the efficiencies under constant head varied between 96.4 and 99.3 per cent. This result shows the marked superiority of the nozzle in question over all forms of conical nozzles. The authors had hoped that the results would help them to establish the relation of efficiency to head, but unavoidable errors in measurement made it impossible to draw any definite conclusion with regard to this point.

Sanitary Condition of Itchen Urban District. DR. H. TIMBRELL BULSTRODE has made a Report to the Local Government Board on the sanitary condition of the Itchen Urban District, where there has been a prevalence of enteric fever. The state of things does not seem to be so bad, in a sanitary sense, as in many cases on which Reports have been sent in to the Board. Dr. Bulstrode considers that, generally speaking, there is no overcrowding of houses upon area, though in certain parts of the old village of Itcheu there is some very dilapidated property and some of the houses appear to have been deserted by reason of their being actually uninhabitable. The closet accommodation is in places inadequate, and one householder complained that in connexion with her house there was no such accommodation whatever. In what may be termed the strictly urban portion of the population

the supply from the mains of the South Hants Water Company is general, but in the rural portions of the district wells are still to be found, and these are for the most part dry steined only, and the coverings to the wells are not always such as to prevent the risk of pollution of the water by surface washings. In regard to sewerage, the urban district may be regarded as consisting of two parts—a smaller, the more populated, which is sewered; and a larger, the more rural portion, which is still unsewered. The sewered area is also, in a sense, divided into two portions—a larger, in which the sewage flows entirely by gravitation, and a smaller low-lying area, comprising a population of about 800, the sewage of which flows into a large circular tank, from which it is pumped into the high-level system. As regards the low-level system, there is evidence on the walls of the manholes of prolonged damming back of sewage both in the northern and southern sewers. This is due to the fact that up to the present time continuous pumping from the storage tank has not been resorted to. This damming back of the sewage in the above manner is, of course, objectionable, and if continuous pumping is not to be resorted to it will be desirable to lower the storage tank, if practicable.

St. John's Church, Newcastle-on-Tyne. THOUGH a sum of, it is stated, 200,000*l.* is offered for the site, the contemplated destruction of this church is strongly opposed in the locality. The Church of St. John the Baptist, in Westgate-street at the corner of Grainger-street West, is the most ancient in Newcastle; it was built for the most part in the XIIIth century, yet retains features of an earlier period. Edward Spoor restored the fabric in 1861, when he removed the galleries and opened out the roof by taking down the plastered ceilings; some further reparations were made subsequently, at a total expenditure of 11,000*l.*; and nine years ago a Norman window in the chancel was reopened. The church contains many old monuments; in the churchyard is the grave of John Cunningham, the pastoral poet, who died on September 18, 1773. At their meeting on December 21, the vicar and churchwardens unanimously declined to agree to a proposal submitted to them by the Bishop of Newcastle for the sale of the site and churchyard and the rebuilding of the fabric, with the existing stones, elsewhere.

Kensington Gardens. ON two or three occasions of late we have directed attention to the disfigurement and spoliation of Kensington Gardens by the wanton conversion of pleasant and secluded foot-paths across the turf into wide and formal gravel walks with iron fencing at the side. We find that yet another walk after that kind is being made over the lawns and through the trees from a junction with the Broad Walk, near the Basin or Round Pond, towards Queen's-gate. The gravel walk is laid through a comparatively unfrequented spot, lying at the foot of the slope, where the pines formerly flourished, and greatly impairs the natural charm and attractiveness of that part of the gardens.

Under this heading Mr. Strand T. G. Jackson makes in the Strand Improvements. Times a protest, with which we are entirely in sympathy, in regard to the want of consideration of existing buildings in the schemes for Strand improvement. He points out that the scale of the Strand architecture is set by Somerset House and the two churches, and that the threatened erection of immense buildings on the northern Strand frontage must have the effect of entirely overpowering these. In short, the true principle in such matters is to consider the character of the old buildings as well as that of the new ones; a consideration far too often lost sight of in what are called "street improvements."

BITONTO.

BITONTO is easily reached by steam tram from Bari, lying some eleven miles north-west of that city. Like many others of the Apulian cities, it was a Greek colony, though there are no remains of antiquity to be seen now. Coins have been found—one type with a head of Pallas armed and on the reverse an owl resting upon a branch of laurel, another with Pallas, and on the reverse an ear of corn, and the inscription "Bitontunon," and a third with an owl above a branch of olive and on the reverse striated clouds and the word "Bytontynon" in ancient Greek characters. In the Itinerary of Antonine Bituntus is mentioned as being on the Trajan way between Ruvo and Bari, and nothing is

known of its ancient history, but in 1010 the Greeks lost a battle here during Melo da Bari's insurrection. The earliest bishop about whom one can be certain is Otto, whose name occurs in 754; but the Cathedral is the latest of the great Norman churches, and must replace an earlier building. It was founded in 1175-1200, but although the main fabric was finished in these twenty-five years, work went on for at least forty years after, the high altar having been made by Mag. Gualterio di Riccardo da Foggia in 1240, and many chapels and altars were added in the XIVth and XVth centuries. Two of the bishops of Bitonto became popes; Giulio de Medici in 1523 as Clement VIIIth, and Alessandro Farnese in 1534 as Paul III. In the XVIIIth century a zealous bishop, Domenico Cedronio, beautified it according to the taste of the day, using a fund of 12,000 ducats left by his predecessor Giovanni Battista Capanus, who died in 1720, and some of this work still remains, though much of it has been removed. In 1818 the diocese was joined to that of Ruvo, so that the church is no longer a cathedral.

In 1248, 1252, and 1254 Bitonto was sacked, and there seems to have been little building done for a century afterwards, the palaces, of which a few examples still remain, indicating that it was once a rich city, being all of a later date. It was, in fact, in the XVth century one of the richest and most noble cities of Apulia, and its principal families—the Vulpano, Rogadeo, Scaraggi, Ferraris, and Bove—were in close commercial relations with all their equals in the other Apulian cities and with the most notable houses of Tuscany, Lombardy, and Venetia, to whom they were often united by ties of blood or marriage. The meeting-place of the merchants was either the house of

the citizens' "Universita" or the seats or "planchetura," of which the traces are still to be seen before the Cathedral or at the side of one of the churches. Of the magnificence of the earlier times but few remains exist, though two palaces of a later date are noticeable, the Palazzo Regna and Sylos-Galo. One palace, the Palazzo Sylos-Lahini, preserves its courtyard (Fig. 1), built for the Vulpano by local craftsmen in 1500, but designed by an architect of Lombardy. The elaborately-carved parapet wall shows busts and portrait heads, half-lengths of Scipio Africanus and Hannibal, the Carthaginian (so labelled) horsemen fighting, and two symbolical figures guarding the family arms—one a man in armour with drawn sword, seated on a curious wheeled throne, the other a crowned woman bearing a branch of some tree, whose seat shows the heads of two snakes, their bodies apparently coiled below, and who has clouds beneath her feet. The pillars are rather heavy, but the whole effect is imposing. At the side is a pretty little well ornamented with garlands. The Vulpano family gave to the town notaries, doctors, and priests, and had commercial relations with the Medici, Gaddi, and Serragli of Florence, the Tolomei of Siena, the Lampugnani of Milan, the Bragadino, Bembo, and Loredan of Venice. At the end of 1445 a Maestro Pietro di Giovanni of Bari, wood or stone carver, was owed more than an "oncia" of silver cavilli by Goffredo, the son of the notary Angelo di Vulpano, and names of sculptors from Bitonto occur about this time in the archives of Bari, showing that there was a school of carvers in the city. In 1446 an "Antonius Nicolai Sculturi de Botonto" is named, and in 1454 a "Maestro Bartolommeo di Maestro Nardo di Bitonto." The buildings put up in Bitonto during the last thirty years of the XVth

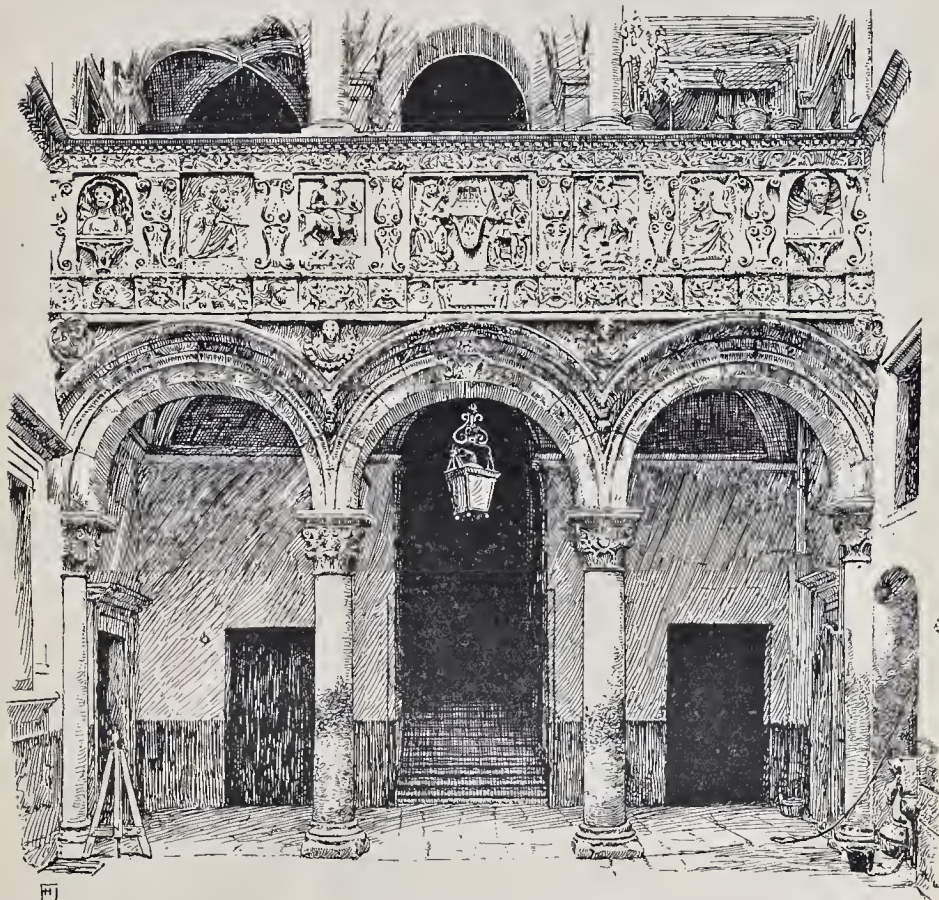


Fig. 1. Bitonto: Courtyard of Palazzo Sylos-Lahini.

century were due to—Maestro Matteo the Lombard; Maestro Bartolommeo di San Severino, living in Bitonto; Maestro Marco di Pietro di Maruggio; and Maestro Bartolommeo di Altamura, citizen of Bitonto—who are frequently named in deeds of the time. Matteo was originally a merchant, and came from Varese (near which was the home of the architects of Modena Cathedral), but gave up trade and took to being a master builder. These names show how the different styles of far-distant parts of the peninsula met and mingled in Apulia, as the names of the artificers of earlier date at Bari also show. The former cathedral is now dedicated to S. Valentine. It was originally a Benedictine church dedicated to S. Maria Assunta, founded by the judge Maggiore, son of Pasquale, King's justiciar of Terra di Bari, and given to the abbey of La Cava, which ceded it to the clergy and people of Bitonto in return for an annual tribute. It was consecrated by Bishop William of Siponto. It has a central nave and aisles with chapels beyond between buttresses, which were probably once outside the wall and which make the present exterior one straight line from transept to west end, except where the "porta della Scomunica" shows its original position. There are three apses masked by a wall between the two flanking towers as at Bari, and the western facade has

the Lombard pilaster strips. There is a crypt beneath the raised transepts and choir almost exactly like that at S. Nicola, Bari, except that none of the shafts or caps appear to be antique, and that the vault is painted instead of having stucco ornament. It has thirty-two columns and corresponding pilasters in the walls, roughly-cut caps and vaulting ribs, and is probably the oldest part of the church. The principal door has above it the Imperial eagle, and during the restorations several portions of busts were found which belonged to the external gallery draped as the figure of Frederick II. is on his angustals, which confirms the date ascribed to it, viz., 1200. There appears to have been a porch at one time, or perhaps the intention of erecting one shown by the springings of arches outwards at the ends beyond the side doors and on the pilaster strips. The bas-relief of the central tympanum shows the Harrowing of Hell. Below, on the architrave, are the Annunciation, the Salutation, the Adoration of the Kings and the Presentation in the Temple. Round the door runs a double band of arabesques; in the inner monsters intertwine with the stems in a masterly fashion, the outer has rosettes as the central feature of each convolution. Above is a projecting hood-mould richly carved with acanthus and volutes, which are made to form a band outside the foliage. The lower portion

of the composition is the usual crouching lion on a bracket-kind of pedestal, with a beautifully proportioned column and cap which supports rather more foolish-looking griffins than usual. The Imperial eagle on the summit of the arch looks like a later addition, and has no connexion with the design. Above it is a carved string course to which two two-light windows are connected by the ornament round them, and higher still is a round window with a hood-mould, at the top of which is a sphinx which is flanked by two lions on pillars supported by corbels. The gable finishes with a round, arched, corbelled cornice as usual, which also returns below the eaves of the nave wall. All the ornament is finely carved, and on the whole better than that of the external gallery. The side doors are simple square-headed openings beneath a round-arched tympanum; above each is a two-light window. The clerestory windows have pierced slabs of stone as at Bari, restored from fragments found. The chess-board billet-moulding was adopted by the Hautevilles as their device. Here it occurs at the top of the transept gable, in which there is a good rose window, below which are two stories of two-light windows much altered and built up. The lowest story has a blind arcading, four small arches beneath two larger in the usual manner, an enrichment which also runs along the base of the tower and of the apse. The "porta della Scomunica," a pointed arch beneath a round arch with a crucifixion in its lunette comes next to the transept, and is recessed between that and the walls of the chapels of the nave. The round arched arcade of this wall has single round-headed windows in four of the five spaces, the fifth being broader and pointed. The Venetian dentil is used to enrich the pilaster imposts. There is now one small campanile at the east end, built at the beginning of the XIIIth century but recast in 1484, and finished four years later when the clock was fixed in it. The names of the masters, Murzio Barba of S. Pietro in Galatina, Paolo de Borgogna, and Nicola Sauto of Bitonto are mentioned in connexion with it. The apse window is of the same character as at Bari but less ornate. High above it is another of a curious shape. The arch is almost four-centred, broad, and slightly pointed, with a row of four colonnettes in the spandrel of the wall, very low in proportion to the width.

The walls are solid, not filled with rubble, and the stones are keyed together so that they show no signs of failure, notwithstanding earthquakes and sieges. On each side of the nave are six arches, round, but with vousoirs deepening towards the keystone. The piers are square in plan, with half columns engaged on each face. The dividing walls of the chapels have a similar engaged half column opposite the pier, and the sides of the central apse have similar columns. The chapels are all newly decorated. The caps of the columns are very varied, showing animals and birds among the leaves. The triforium has been opened out again, the XVIIth century disfigurements having been removed, as also in the nave roof; but the apse and transept still retain them, and the flat ceiling of the latter hides the rose from view from inside. There are three arches beneath a larger one in each bay with caps and bases to the well-proportioned columns. A curious feature is that the outer arch is borne by a little squat pillar standing on the cap. There were originally no stairs to the first floor of the towers. During the restorations a little door was discovered towards the transept, and another on the other side in the aisle; the tower was approached by a drawbridge between these doors, called in ancient documents "gaifum," according to Sig. E. Bernich, under whom the restorations were carried out. In the nave are two ambos, which M. Bertaux considers to be of the same date, though they are very different in design. One (Fig. 2) is dated 1229, and signed "Nicolaus sacerdos et magister." This is the same man who signs the first story of the campanile at Trani. He was probably a Roman Benedictine. The whole inscription runs "Hoc opus fecit Nicolaus sacerdos et magister anno millesimo ducesimo vicesimo nono Docta manus ne fecit ad hoc ut lectio vite hic recitata ferat fructum mentes A," and below the book desk "Nicolaus Magister" is still legible. This is ornamented with arabesques underneath, and rests on an eagle with fine large feathers. It stands on a bracket, which is upheld by a seated figure. The curved projecting centre is decorated with rosettes in coffers, between which are bands of inlaid circles; the rectangular

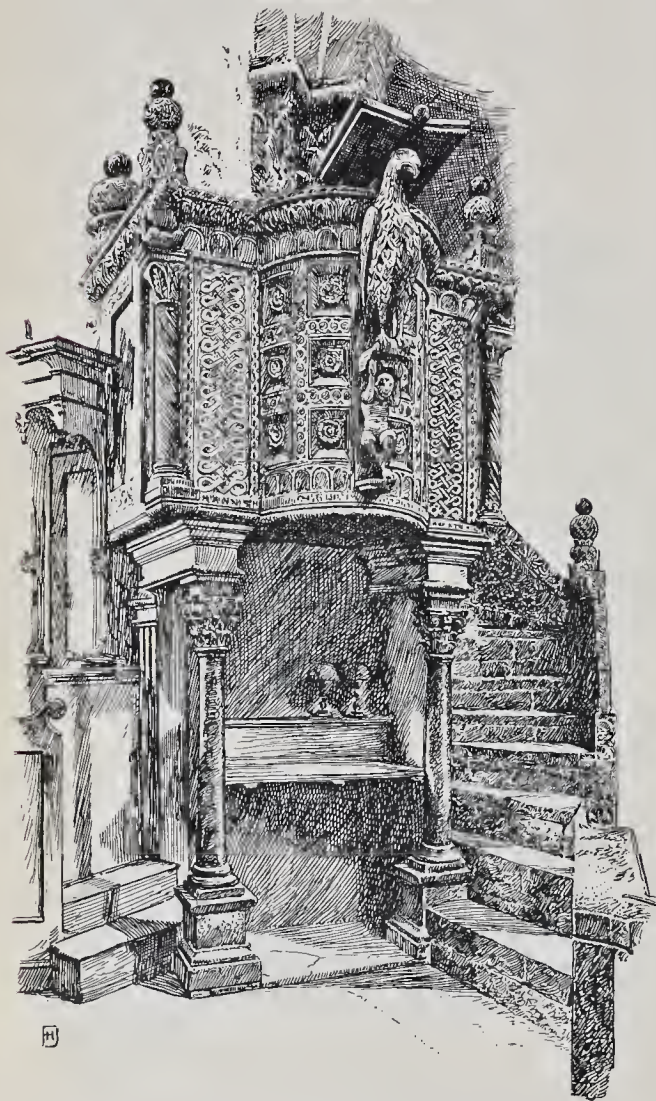


Fig. 2. Bitonto: Ambo made by Nicolaus.

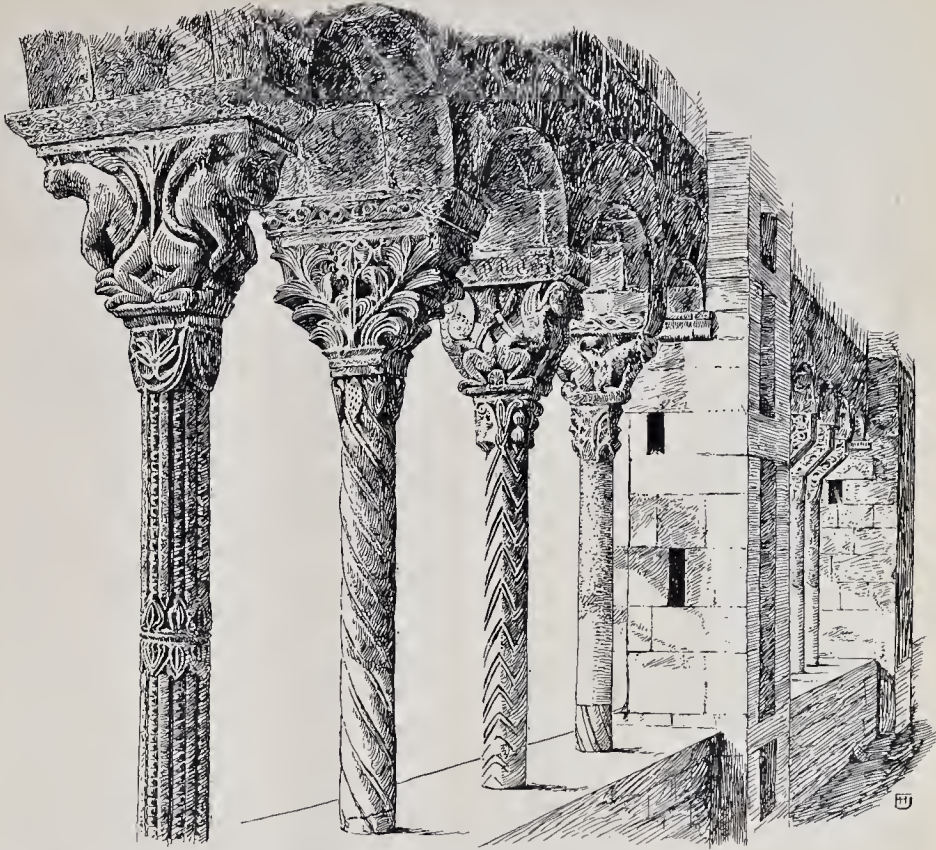


Fig. 3. Bitonto: External Gallery beyond Matroneum.

parts have panels and bands of ornamental interlacings. At each corner is a twisted column supporting a lion and a griffin respectively. Above the richly-carved cornice are ornamental terminations, which all consist of a ball of coloured marble above another carved like basket work, upon a base also carved with ornament. The side panels are plain. It is much inlaid with marbles of varied colour, and also with pieces of gilded glass with painting between glass and gold. The columns upon which it rests are of later date, and the stairs also must have been altered when it was placed in its present position, just within the rails of the choir on the right side. On the sloping parapet of the stair are carved figures of Henry VI., Constance his wife, Frederick II. with his son, and the Imperial eagle. Schulz describes the scene as the Adoration of the Kings. "Mary sits on a throne with a crown on her head, she has a lily sceptre in her hand. The kings have barbaric, broad faces, and short, full, pleated clothes. They stand on little corbels." The figures are beneath a corbelled arcade, with a boss beneath each arch ramping with the slope of the stairs. The font is of the same character as this ambo, and is the work of the same Nicolans. It has a large bowl with an arcade upon it radiating from the bottom with bands of XIIIth century ornament upon the archivolts, and a conical later cover. The nave capitals are much varied, and some of them very good. They also are ascribed to Nicolans, whose work they resemble. The other ambo, which is square with bands and panels of flat ornament, was the work of Mag. Bonifacio. It rests upon two columns, which were inlaid. The two front ones, with arabesques cut deeply, the back ones twisted. The panels of rosettes and interwoven cords were also inlaid with vitreous pastes, and in the centre of the larger compartments on one side creatures are painted upon the enamel. Sig. Avena says that this

pulpit makes one think that Arab artists worked here, but the design is not Oriental, and the Norman chequer appears in the abacus. The altar and ciborium, made in 1249 by Mag. Gualterio di Foggia, was destroyed in the XVIIIth century; part of the ciborium may be seen in the tomb of Bishop Carafa—small columns with varied caps. The inscription is preserved in the hall of the bishop's palace. The ancient frontal was discovered adapted to the altar in the chapel of S. Gregory Thaumaturgus. It has in the centre a little window, with columns and caps and a foliated architrave. In the treasury is an interesting silver-gilt chalice of XVth century Abruzzese work about a foot high. It is marked T E R beneath, and was probably the work of Nicolo Galucci of Guardiagrele, who worked at Teramo. The foot has six alternate compartments of angels, two coats-of-arms and a Madonna, the three latter with enamel backgrounds, etc., and arabesques. The knop has six panels beneath canopies with the Evangelists' symbols, the Pietà and Ecce Homo with enamel grounds, and above and below six other slighter panels similarly treated with half-length figures of the Apostles. The arms are those of the houses of Taranto and Acquaviva, and it was probably presented by Giulio Antonio Acquaviva, son of the Duke of Atri and Condottiere for his brother-in-law, Giovanni di Balzo Orsini, Prince of Taranto, who seized the city about 1460, on the occasion of the recognition Mass after he was confirmed in possession of the city in 1462 by King Ferdinand of Naples. The gallery outside the Matroneum (Fig. 3) runs above the chapels. It is of the period of Frederick II., and has been roofed and restored with judgment. At Bari similar galleries exist, but they have been built up. The carving of the caps shows great variety and fancy. Many of them have monsters seated back to back, griffins with men's heads, apes with the heads of cats, etc.,

and others fill the long side with interlacing stems and foliage. The columns have no bases, and are many of them ornamented with channelling, either twisted, zig-zag, or upright, in the last case pearly and interrupted with bands of Oriental detail, and the same influence appears in the curious secondary caps below the large ones by which the circular plan changes to square, cut out of the same piece as the shaft. The XIth century church at Altamura, altered in the XIIIth century under Frederick II., has several curious similarities to this of Bitonto. The pier, which here divides the nave arcade into two groups of three arches, at Altamura is repeated, and divides the seven arches into one group of three and two groups of two arches each; but from them transverse arches span the nave, as at S. Nicola, Bari. The aisles are groined and flanked by a line of chapels, of which the nearest to the transept becomes a recessed porch, as at Bitonto. On the other hand, fresh features appear at Altamura—the bays of the aisle are separated by pointed arches, and transept and apse are square and unbroken, a feature which is English, though occasionally occurring in France.

There are a few Gothic churches in the town, most of which have been sadly modernised. S. Francesco is perhaps the most noticeable, founded in 1283, and consecrated three years later, Romanesque in plan with Gothic details. It has a pointed doorway with carved ornament of pine cones or grapes, and palm or fir leaves a good deal conventionalised. Among these Apulian churches it is not so striking as it would be elsewhere. S. Domenico was built in the first half of the XIVth century by the gifts of Carlo di Durazzo, lord of Bitonto. It had a high altar made by Francesco de Oulato di Bitonto in 1388, at the expense of the noble Vito de Joannone. The door and the holy water basin are noteworthy, and the XVth century monument of Pichuccio Bove.

S. Anna belonged to the Rogado family till the middle of the XIVth century. It has a round-arched doorway with zigzag ornament.

Portions of the city wall remain, a round tower of the middle of the XIVth century, and a gate or two, which are picturesque but not remarkable architecturally. There is a good deal of good iron work, principally in the form of knockers and balconies. Many of the former remind one of others seen in far distant parts of Italy.

E. H. J.

RECENT DISCOVERIES IN THE ROMAN FORUM.

SINCE the appearance of my last article on this subject in the *Builder*,* there has been nothing of first-rate importance to chronicle, but the excavations are still being continued, though not, for the moment, with as much activity as heretofore. This has been largely due to Comm. Boni's absence in the summer upon a tour in other countries—including Ireland—undertaken with the object of studying the remains of primitive art there and comparing them with those discovered in the Forum, and also to the fact that it will not be possible to continue the excavations of the Basilica Aemilia upon the site bought for the purpose by a further gift from Mr. Lionel Phillips until the new building at S. Francesca Romana, which is to contain the Forum Museum, the directors' offices, etc., is at least ready for the reception of the latter so that the present structure can be removed.

The winter rains and the consequent rise in the level of the water have led to the temporary abandonment of the stratigraphic explorations in the open area of the Forum and to the further examination of the primitive cemetery close to the temple of Antoninus and Faustina, and work is at present proceeding only in the higher portions.

To the south-east of the arch of Titus, the work of clearing the foundations of the temple generally attributed to Jupiter Stator (*cf. Lanciani, Ruins and Excavations*, 200) has been commenced, and the north-east and north-west sides of the concrete core can now be distinguished from the later additions, which consist of a mass of concrete of the Classical period (perhaps the foundation of steps) on the north-east and of the lowest portion of the medieval *Turris Chartularia*, in which fragments of white marble are largely employed. A few of the large blocks of stone of the wall which supported the external columns are still *in situ*, and so, perhaps, are portions of the walls of the cellar of the temple. To the north-west of the arch stood, in all probability, the temple of the Lares—though some German authorities prefer to reverse the positions of these two edifices! Of this a portion has probably been discovered—a wall in *opus quadratum* of tufa, upon which rests a travertine pilaster base, upon the north-western edge of the road which ascends to the Palatine. A cross-wall runs for a short distance north-westwards, but both it and the main wall are soon interrupted, having been destroyed by the extensive reconstructions which have taken place. A mass of concrete foundation has been superimposed upon them, and a huge foundation wall of the same material was erected a short distance to the north-west, which has very likely been the cause of the destruction of a good deal of the temple. The building was reconstructed by Augustus, and to this period belong, apparently, the remains before us.

To the north-east, at a deeper level, a portion of the tufa rock of the ridge of the *Velia* has been laid bare; it has an artificially flattened surface, with a flight of steps cut in it, while to the north-west of the temple are the remains of a large house of the late Republican period, which have a slightly divergent orientation. The greater part of this building has been exposed for some time; it has been much destroyed by the massive concrete foundations of some building of the late Imperial period. The earlier pavement of the road ascending to the Palatine, belonging to a period previous to the erection of the arch of Titus, has been

* July 23, p. 88; *cf.* also August 13, p. 178.

† This building is of uncertain date and nature. From its orientation, it would seem to be contemporaneous with the Basilica begun by Maxentius (which generally bears the name of Constantine, who completed it), and was very likely a portico fronting upon the *Sacra Via*, which thenceforth ran between it and the Basilica, and then, turning at right angles, between it and the temple of Venus and Rome.

traced a little further up the hill (beneath it is a congeries of remains of drains and buildings of various periods), and that of the *Nova Via* is now being laid bare. It lies about 3 ft. below the late imperial or mediæval pavement, and shows surprisingly little sign of wear—unless it happened that it was "roughed" only a little while before it fell into total disuse, we may infer that it had comparatively little traffic to carry—and, indeed, the recent excavations have shown that it was a *cul-de-sac*. At the edge it seems to have been covered by a footpath of slabs of travertine, but this is hardly wide enough to account for the freshness of the surfaces of all the blocks now visible. The arches which are seen crossing the road and those which run parallel to the façade of the buildings on its south-west side* are posterior in date to this pavement, as their footings rest upon it. The drain which runs under the road is now being explored; it is crossed by drains belonging to the southern angle of the house of the Vestals, connected apparently with its enlargement in the time of the Flavian emperors (*Tribuna*, December 5).

Work has just been recommenced in the Basilica of Constantine, and the interior will be cleared down to the level of the original pavement. Some fragments of it, consisting of small pieces of coloured marbles, set in patterns, were discovered in the spring, and also fallen masses of the vaulting of the roof, the coffering being in some cases well preserved.

THOMAS ASHBY, JUN.

TWO OLD MAPS OF LONDON AND THEIR AUTHORS.

WE may opportunely devote a few words to the story, on its ichnographical side, of the two maps which the London Topographical Society will shortly issue to their subscribers. The bird's-eye view which is generally attributed to Radulph Agas possesses the greater antiquarian interest, though, regarded as a historical document, and allowance being made for its priority in respect of time, it is less valuable than the later one published by Morden & Lea. Of Agas's map—for so we must call it in default of a more authentic name—there are original copies in the Pepysian Library at Magdalene College, Cambridge, and in the Guildhall Library, London. The latter was printed without either date or scale. *temp.* James I., whose coat-arms it bears at top, yet the royal coat-arms of Queen Elizabeth are carried by the State barge. And since St. Paul's is drawn without the spire, which was destroyed in 1561, and not rebuilt, whilst the Theatre erected in the liberty of Halliwell, Shoreditch parish, in 1576 by Burbage is not delineated, we may fairly presume that the view was taken within that period. Agas was born in or about 1540 at Stoke-near-Nayland, Suffolk, and died there on November 26, 1621. He practised as a land surveyor chiefly in his native county during forty years, as he himself tells us, wrote several treatises relating to his craft, and by his own account was skilfully versed in the exercise of his calling. In the Lansdowne and the Additional MSS., British Museum, are two letters written by Agas to Lord Burghey; one, dated February 22, 1592-3, is described as "A Noate for the Perfection of Lande Measure and exact platting of Cities, Castles, Honors, Lordshippes, Maners, and Landes of all sortes," and mentions the "profitable staffe" and a theodolite of some 20 in. in diameter, with a protractor of at least 1 ft.; another describes his labours in the fen lands. His fame now rests mostly upon the views accredited to him of London, Oxford (1578), and Cambridge (1592). Examples of the latter two are in the Bodleian Library. George Vertue's fraudulent reproduction made in 1737 for the Society of Antiquaries of the London view may be rejected as untrustworthy. He inserted a date, "1560," in Roman characters, and made alterations and omissions—using some pewter plates now conjectured to be spurious. Of the copy belonging to the Corporation of the City, W. H. Overall, F.S.A., their librarian, brought out in 1874 an exact facsimile, executed by F. J. Francis; the original measures 6 ft. $\frac{1}{2}$ in. by 2 ft. $\frac{1}{2}$ in., and is printed from wooden blocks. Agas's map, into which he introduces many a little bit of

quaint verisimilitude, has the inherent defect of combining plan and perspective, the plotting of the foreground with its buildings merging northwards into illusive perspective. But not so with the map which Robert Morden and his coadjutor, Philip Lea, published in 1682 from a survey, to a scale of 300 ft. to the inch, made by William Morgan. His Majesty's cosmographer. Morgan's work formed the basis of many subsequent plans of parishes, city wards, liberties, etc., notably those by R. W. Seale, B. Cole, R. Bloome, Thomas and John Bowles, and others, for Seymour's and Strypes's editions of Stowe's survey, Maitland's "History of London," and similar works. A copy of Morden & Lea's first edition, 7 ft. 7 in. by 5 ft. 1 in., on eight sheets, is in the Grace Collection; at the base, along the entire length, is a view, from various positions, of the town. As a specimen of cartography it is superior to the map, 1677, of the City of London, to a scale of 100 ft. to the inch, prepared by Morgan and John Ogilby, and engraved for the most part by Hollar, who died in 1677. Of Ogilby & Morgan's map there are reprints, on eighteen sheets, 1732, by Morden & Lea, and by De Wit; and another edited by the London and Middlesex Archaeological Society ten years ago. Any such detailed plotting was not again attempted for London as a whole until Robert Horwood, of Liverpool, devoted the last ten years of the XVIIIth century to the map, to a scale of 2 ft. 1 in. to a mile, he made for the Phoenix Fire Office, engraved by Ash, and published in 1795-9, for which the Society of Arts gave him an honorarium of fifty guineas in 1802. Robert Morden, who died in 1703, traded as a map and globe maker at the sign of the Atlas in Cornhill, with, for a while, his partner, Thomas Cockerill. He published a large number of county and other maps for Great Britain and Tartary; he was the author of an "Introduction to Astronomy, Geography, Navigation, and other Mathematical Sciences," 1702, and of a description of a large quadrant constructed by H. Sutton, 1669. His maps were used for Bishop Gibson's edition, 1695, of Camden's "Britannia," and for the Reverend Thos. Cox's "Magna Britannia," 6 vols., quarto, 1720-33. With Philip Lea he brought out "An Actual Survey of London, Westminster, and Southwark," 1700, on two sheets, drawn and engraved by J. Harris; a quarto volume entitled "A Book of the Prospects of the Most Remarkable Places in and About the City of London," probably in 1700, and Hollar's map of London and the suburbs, 1675. The Corporation possess a later copy of their large map of London, which bears a dedication to William and Mary, with portraits of those Sovereigns, and was published by them at the Atlas and Hercules, Cheap-side, as well as at the Atlas in Cornhill.

ANOTHER NEW STONE-WORKING MACHINE.

IN our issue of September 3 a description was given of a stone-working machine, which represents the latest advance in this country towards the replacement of costly hand labour by cheaper and more efficient mechanical methods. We are now in a position to furnish our readers with some details of an invention of somewhat similar character, but which up to the present has been used exclusively in Germany. This machine is made by Messrs. Bercher & Gerhäuser, of Altengronau, and the sole British agent is Mr. A. Strauss-Collin, of London.

The machine in question is intended for moulding, planing, turning, and sawing marble, granite, syenite, and other stones. In general appearance it somewhat resembles the iron planing machine used by engineers. The front edges of the cast-iron uprights are shaped to form vertical guides, up and down which a table can be moved by means of a serewed shaft actuated by means of a hand wheel placed within easy reach of the operator. A secondary table works on horizontal guides, provided on the first table, and can be moved backwards and forwards by means of a second hand-wheel placed alongside that first mentioned. Thus it will be seen that the arrangement is akin to that of the familiar slide rest of a lathe.

To the secondary table is attached the cutting mechanism, all of which is enclosed to protect it from dust, and at the end of a shaft worked by the gear is a carbondrum cutting-wheel, or a diamond circular saw,

* The chambers fronting upon the road seem to have been shops. In one of them a mosaic pavement with a fine geometric design has recently been discovered.

running at from 1,500 to 1,600 revolutions per minute. By means of a hand wheel, the working shaft, with its cutting tool, can be moved through an angular distance of 180 degs. in a vertical plane, so as to suit different thicknesses of stone, or to permit the tool to be applied to any desired part of the work without changing the position of the main slide. By a simple yet ingenious device the cutting-wheel when in any position can be driven by the same belt which transmits power to the machine itself.

The table on which the work is clamped moves along horizontal guides, and has three speeds for the backward and forward strokes. The traversing motion is effected by means of worm gear fitted below the table, and adequately protected from dust, and a hand wheel is also provided for convenient adjustment.



Two attachments with which the machine is furnished deserve particular mention. The first is a device upon which circular slabs of any diameter can be finished, either plain or with ornamental moulding on the edges. This auxiliary consists of a cast-iron stand with a turntable, on which the work is fixed and rotated by a worm connected with the driving gear; it includes, further, a stand with a self-centring block, so that no previous determination of the centre is necessary. The appliance is driven by a flexible shaft actuated from the main shaft by rope transmission. The second attachment is a form of chuck to assist in the turning of small columns, balusters, vases, and other details, and in which several pieces of stone may be fixed at one time. Rotatory movement is given by means of suitable gear, so that as the chuck passes to and fro upon the travelling table all parts of the work are brought into contact with the cutting tool.

In virtue of the different motions and auxiliaries described, the machine is capable of manipulating the work horizontally, vertically, or at any desired angle, and the material to be worked may be of any length, with a width up to 80 in. and a depth up to 52 in. Moreover, the machine can be utilised for forming any required rectilinear, curved, and scalloped mouldings on slabs, irrespective of the height and width of the work.

Some idea of the rate of production may be gathered from the following statement, which refers to the formation of the shapes illustrated in the figure. These were cut in rough sawn marble slabs 2½ in. thick. The time required for cutting mouldings in granite and syenite is proportionately longer.

No.	1.....12	minutes per length of 40 in.
"	2..... 5	" "
"	3..... 5	" "
"	4..... 3½	" "
"	5..... 15	" "
"	6..... 3½	" "
"	7..... 11	" "

The machine measures about 17 ft. long, 10 ft. wide, and about 10 ft. high. At the present time twenty machines are in operation in various German towns, and we learn that one of the leading English marble-working firms has ordered a machine, which will shortly be erected in this country.

ROYAL EXCHANGE.—On December 19 the Lady Mayoress unveiled a fresco in a panel of the south wall, painted by Mr. Edwin A. Abbey, R.A. The picture is a gift of the Merchant Taylors' and Skinners' Companies, and represents the reconciliation in 1484, after a long dispute, between the two guilds, which they commemorate by a joint feast, to the present day, yielding precedence the one to the other in alternate years.

IMPROVEMENTS AT LLANDRINDOD WELLS.—In the next session of Parliament the Llandrindod Wells Urban District Council are asking for authority to extend their waterworks, acquire land for golf links, and erect reading and refreshment rooms in recreation grounds which may be acquired. They also ask for powers to provide a town hall, public hall, assembly rooms, and other public buildings, subject to the sanction of the Local Government Board.

OPEN SPACES AND THE SANDHILLS ESTATE, ST. PANCRAS.

It is stated that the Skinners' Company, who are owners of the property in trust on behalf of Sir Andrew Judd's Grammar School at Tonbridge, have agreed, with the concurrence of the St. Pancras Borough Council, to surrender a space 30 ft. wide along the forecourts of Nos. 45-113, Euston-road, for the bringing forward of the building line by 20 ft., as part of a scheme for the erection of a high-class hotel and improved residential property on the southern side of the main road, being of opinion that the existing forecourts "must be got rid of before any real improvement can be effected." They are prepared, further, to make over to the Borough Council the freehold of the garden in Burton-crescent for future up-keep by the Council as a public

space, and freely to convey as much land as will be needed for the proposed opening out of Burton-street on the east into Duke's-road. The property of the Skinners' Company in that quarter consists of lands purchased there (and elsewhere in London) by Sir Andrew Judd for the endowment of his school (1558), and vested in them for the benefit of the school by an Act of 1572. Judd bought the land for 346l. 6s. 8d. from John Gates and Thomas Thorogood. In his deed of bequest to the Skinners' Company it is described as:—

"A close of pasture with the appurtenances called the Sandhills situate lying and being on the back side of Holborn in the parish of St. Pancras of the yearly value of 13l. 6s. 8d."

A survey of the Sandhills estate dated May 2, 1783, shows that it then consisted of grass-land, about 27 acres in extent, traversed in its northern portion by the New-road (now Euston-road), with one house and a bowling-green, at the northern end of the later Thanet-street. The Sandhills estate was demised for a while at a small rent to the Duke of Bedford. In 1807 the Skinners' Company leased nearly all the land to James Burton for a term of ninety-nine years at a ground rent of 2,500l. per annum. Burton laid out the ground, building the streets which, with Burton-crescent, are situated within the area having Tonbridge-street along the north-east side, Leigh-street and Crescent-news South along the south-east side, Burton-street and Crescent-news North along the south-west side, and Euston-road along the north-west side. The outlying portion, about 5 acres, on the northern side of Euston-road has since been disposed of to the Midland Railway Company. The property, as laid out by Burton, has, from various causes, not realised the projector's expectations. The leases will terminate in 1906, and it is estimated that the new ground rents will then yield an increased income amounting to about 20,000l. per annum in favour of Tonbridge School. The statue, a poor thing, in Burton-crescent garden of Major John Cartwright, *obit* 1824, is by Clarke, of Birmingham. New-road was made in pursuance of an Act of Parliament in 1755-7 as a route offering many anticipated advantages from the end of the City-road to the Yorkshire Stingo at Lisson-green, and was laid out in terms of the statute as a kind of boulevard, the houses having front gardens or forecourts along nearly the whole of its length. In its conception it might have been one of the finest streets in London; but subsequent encroachments in advance of the building line—notably in the portion now called Euston-road—and other reasons, combined with the inferiority of the near neighbourhood in the St. Pancras and Pentonville districts, have contributed to its disfigurement and degradation, so that it has failed to take rank amongst the ornamental thoroughfares of the Metropolis.

CHINGFORD PARISH CHURCH.—Some carved oak stalls for the clergy and oak desks for the choir boys have been presented to the Chingford Parish Church. The stalls are made from designs prepared by the architects of the new portion of the church, Messrs. Blomfield, and are part of a plan for choir stalls for the men and boys which it is hoped may be carried out some day.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

At the meeting on the 14th inst. Mr. Theodore Fyfe read a paper on "The Natural Lighting of Interiors." The paper was illustrated by lantern slides of various interiors at home and abroad, and a number of photographs were also exhibited. He said that in the study of structure as evolved from plan, the importance of lighting as a means of effect was realised. In old work we often perceived that a noticeable light effect was the result of a careful study of the entire situation, often a necessity from the very nature of the case. In the Temple of Hathor at Denderah the light from the doorways penetrated a certain distance into the building. The central chambers had a few upper loopholes or slits, enough to prevent total darkness while preserving the mystery of the Temple shrine. But artificial light must also have been resorted to, even in the intense brightness of Egypt. The lighting of the Pantheon at Rome was unique in Europe, and nothing could be more majestic. The light was also perfectly adequate. In Santa Sophia, Constantinople, we got the effect of one vast and swelling hemispherical construction, so that the insistence of the strong band of windows at the base of the dome was just what was wanted to give point to the crowning feature. SS. Sergius and Bacchus, Constantinople, an eight-sided building with a sixteen-sided dome, showed beautiful lighting from small windows distributed high up. This was a feature of Byzantine churches generally. The Mohammedan tombs at Bitou had a different ideal. The predominant note of their interiors was the decoration in coloured tiles. To get the full effect of this, plenty of light was required, and we found the windows were large, placed low in thick walls, giving deep ingoings. In the Mohammedan and Coptic work in Egypt we found something more akin to the Byzantine methods. The Coptic church at Old Cairo was a wonderful example of a dimly-lit building. Of Lombard buildings in Italy, a beautiful example was San Michele at Pavia, one of the finest interiors in Italy. The aisles, transepts, and dome were lit by small windows, high up. The feature of the Italian Romanesque east end was a circular window placed high, and this was also used with fine effect by Brunelleschi in the Badia Church, near Fiesole. In the basilican churches of Italy and Sicily, on the other hand, the east end was apsidal and unlit, the aisles being occupied by chapels with little or no light, so that the buildings were dependent on the nave clerestory windows. Fergusson had eloquently described the effect of the Buddhist rock-cut temple at Karli, which resembled the western basilica in its plan, and obtained its light entirely from a large upper opening at the entrance end. The wood roofs in Italy were occasionally well lit, as in San Stefano at Venice, where semicircular windows cut into the roof with groining. Gothic work in its complete state represented the apotheosis of the stained-glass window, and this kind of architecture scored in a double way, as the decoration of the interior was obtained not in spite of but by means of the light. Of Renaissance ecclesiastical interiors, St. Peter's was the typical example in the one-dome plan. From the entrance, the dome appeared as a great well of light. On nearer approach we saw the great light space above the pendentives spreading itself down to the giant arms of the cross. In our London atmosphere, the colonnade round the dome windows in St. Paul's was unfortunate from an interior point of view. The aisles in St. Paul's were well lit, but the most original feature in the lighting is the series of windows in the spaces above the dome side-arches. The Laurentian Library at Florence was a good example of a large civil building of Renaissance times. It showed a fine vista which suggested comparison with the King's Library at the British Museum, but in the latter the sense of length was spoiled by the break in the centre. The Vatican Library suggested a cheerful and well-lighted crypt. The windows were ample and low, so that the decoration could be properly seen. Concerning modern work, it was impossible in the limited time to do more than briefly generalise. It was desirable that we should recognise the possibilities of lighting in small churches, and avoid being governed too much by convention in such window disposal. In churches, good well-thought-out lighting went far to redeem indifferent detail. Concerning east windows, it was best to admit little light from the end, to obtain what more was necessary from the sides, and to have small

windows generally at the east end, thus approaching the Byzantine method. Light coming only from the ceiling was unwelcome in churches, as in the Madeleine at Paris, a building where the interior was sacrificed to the exterior. Wren's churches showed ingenious and good lighting for a city atmosphere. Among others too numerous to mention, St. Margaret's, Lotbury, St. Mary, Abchurch, St. Mildred's, Bread-street, Christ Church, Newgate-street, and especially St. Stephen's, Wallbrook, showed lighting that was interesting and often very effective. Domestic work was, of course, their chief concern, and they could learn much about the perfect rendering of light effects in domestic interiors from the paintings of Pieter de Hooch and Terborgh. In the town they wanted, usually, as much light as they could get, but in the country they could often revel in the more open surroundings. Some rules that might be advanced were:—Light a room entirely, or mostly, from one side; be chary of introducing windows in fireplace walls; suit windows carefully to the shapes of the rooms they occupy. During the paper reference was made to photographs on the walls of many of the examples mentioned, and in concluding a number of slides were shown, representing some characteristic lighting at home and abroad.

The reading of the paper gave rise to an interesting discussion, in which Messrs. W. Wonnacott, H. Passmore, W. Curtis Green, Bernard Webb, W. L. Trant Brown, and the Chairman (Mr. H. Gregory Collins) took part. Mr. Henry T. Hare then summed up the discussion, as special Visitor, and said that although the subject did not lend itself to controversy in any great measure, as there could not be any hard-and-fast rules laid down, it was an important one to architects. He was glad that Mr. Fyfe had not attempted to lay down any rules, for he thought that a good many erroneous ideas were conveyed in this way. It was best to take mental notes, as they had that evening in looking at the illustrations, and then go home and think about them. He referred to the lighting of the Pantheon as the most successful he knew of, and mentioned the Picton Reading-room at Liverpool, which was most satisfactorily lighted in much the same way. The advantage of windows high up in a dome was the great diffusion of light obtainable, and the consequent small window area necessary in comparison to space lighted. Regarding domestic work, aspect and prospect considerably influenced the size and position of windows, and with reference to lighting from one side only, he was not a believer in this, as he knew of many successfully-lighted buildings where side and end light were combined, notably in some of Mr. Norman Shaw's work. The fixed rules for ratio of window to floor area, as determined and enforced by local and other authorities, were a great source of trouble—and to no good purpose.

Mr. Fyfe briefly replied, and the meeting then terminated.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—The third meeting of this Society for the present session was held in the Law Library, Cook-street, on the 19th inst. Mr. John Murray read a paper, illustrated by lantern slides and drawings, on "Scotch Plaster Work of the XVIth and XVIIth Centuries." He discussed a number of decorated ceilings of the period found in Scotch castles and country houses, and in the old town houses of Edinburgh, and showed the influence of Italian and French taste and the gradual increase of richness in the ornament. The work of the XVIIIth and early XVIIIth centuries was largely that of Adam or of his son. All the modelling was hand-wrought. In conclusion, Mr. Murray insisted on the importance of artistic plaster work in interior decoration. It was at least as important as decoration in wood or metal.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—On the invitation of the Chairman, Mr. Samuel Cutler, junr., M.I.Mech.E., a large number of the members of this institution recently visited the International Gas Exhibition at Earl's-court. They were received by Mr. J. W. Helps, M.Inst.C.E., Chairman of the Advisory Committee of the Institution of Gas Engineers, under the auspices of which the exhibition was held, and shown over by him and Mr. S. Y.

Shoubridge, of the South Suburban Gas Company, Mr. A. E. Broadberry, of Tottenham, and Mr. A. W. Onslow, of the Royal Arsenal, Woolwich.

COMPETITIONS.

INFECTIOUS DISEASES HOSPITAL, SETTLE.—Six sets of plans, submitted by as many architects, in connexion with a proposed infectious diseases hospital for the Settle district, were rejected on the 20th inst. by the Settle Rural District Council as being too elaborate. It was agreed to pay the architects who had been invited to send plans a solatium of five guineas each, and the Council decided to entrust the erection of the hospital to the Sanitary Engineer (Mr. T. A. Foxerott). The Council think that 4,000*l.* will be quite enough to spend.—*Yorkshire Post.*

MUNICIPAL OFFICES AT BRIXTON.—The following are the conditions as adopted by Lambeth Borough Council on Thursday, December 22, for the competition in respect to the erection of municipal offices at Brixton-hill; Mr. Hare assessor:—(a) That the competition be open to all architects, in accordance with the principle laid down by the Institute in clause 5A of its Suggestions; (b) that in the instructions governing the competition, a clause be inserted to the following or similar effect, namely:—

"It is the intention of the Council to appoint the author of the design placed first by the assessor as the architect for the work, unless a sufficient reason exists to the contrary."

(c) That a prize be awarded and paid to each of the two authors whose designs are placed second and third in order by the assessor; the first of such prizes to be the sum of 200*l.*, and the second of such prizes to be the sum of 100*l.*; that no extra premium (over and above the regular commission) be paid to the author of the design placed first by the assessor; and that the three designs, so placed first by the assessor, be the property of the Council; (d) that the architect selected to carry out the accepted design be paid in accordance with the Schedule of Professional Charges, sanctioned by the Royal Institute of British Architects; (e) that if part only of the design be carried out, the architect be paid a sum to be agreed upon in respect of the deferred portion of his design, such sum to merge in the schedule fees upon completion of the buildings; (f) that in the event of the Council giving no instructions within twelve months to proceed with the work, the selected architect be paid a sum of 300*l.*, such sum to merge in the regular commission when the work is taken up; (g) that in the event of the Council abandoning the proposed work, the selected architect be paid a commission upon the estimated cost of the building at a rate of 1½ per cent.; (h) that the Institute's Suggestions numbered 4 and 6, as to drawings, be incorporated in the instructions to be issued by the Council; (i) that a deposit on the supply of instructions be required from every applicant, the assessor to suggest the amount of such deposit; such deposit to be returned on the receipt of a *bona-fide* design, or if the applicant declines to compete and returns the instructions, within a month after their receipt; (j) that a declaration be required from every competitor stating that the design is his own personal work, and that the drawings have been prepared under his own supervision; (k) that the five reasons put forth by the Institute in Suggestion No. 9, for the exclusion of designs be adopted; (l) that, with the consent of their respective authors, the designs submitted in the competition, except any design excluded under clause 9 of the Institute's Suggestions, be publicly exhibited after the assessor has made his award, and that the award be published at the time of exhibition.

PROPOSED TOWN HALL AND BATHS, WIGAN.—The Wigan Corporation propose, in their Omnibus Bill which they are promoting, to take land for the erection of a town hall, municipal offices, court-house, police stations, public baths, etc. The estimate for the site and building of the town hall and offices is 85,000*l.*, and for the furnishing of the buildings 5,000*l.* For the purchase of land and erection, furnishing, and fitting up of the baths, the estimate is 10,000*l.* In addition they propose to spend 4,000*l.* on street improvements, 31,000*l.* on tramways, and 30,000*l.* under the Public Health Act.

Correspondence.

GLASGOW INSTITUTE OF ARCHITECTS.

SIR,—I have been instructed to send you the enclosed letter regarding "presentations on the occasion of the laying of foundation-stones and other ceremonies," and my Council hopes that, as the matter is of general interest, you will be good enough to insert it in the next issue of your journal.

December 22. C. J. MACLEAN.

*The following is the circular letter referred to:—

"115, St. Vincent-street, Glasgow, December 22, 1904.

DEAR SIR,—The Council of the Institute has had under consideration the apparently increasing prevalence of valuable presents being given on the occasion of the laying of foundation-stones or formal opening of buildings by the architects concerned to those officiating, and even in some cases to their wives or relatives.

In such circumstances, and where the importance of the building warrants it, the presentation of a trowel or key by the contractors is often expected, and the action of the architect in co-operating in such cases, either financially or by designing and selecting the article, as also in representing those concerned at the presentation, is in no way criticised by the Council.

Anything beyond this, however, is considered objectionable, as setting up between architect and client a wrong relationship of donor and recipient, and as unfair to many of the profession in encouraging rivalry as to the importance and value of the respective gifts.

Such, after due consideration, being the unanimous feeling of the Council, it has been thought desirable to place these views before the members of the Institute generally, and to ask their co-operation in discouraging the practice referred to. The Council being assured that members will not only recognise the validity of its objections, but welcome its support in this matter.

In name and on behalf of the Glasgow Institute of Architects.

C. J. MACLEAN, Secretary."

*We are glad to publish the letter of the Glasgow Institute as they ask us to do so, and as we entirely agree with the opinion expressed; but we must add that we are not aware of any such practice in England (as distinct from Scotland); at all events, if it exists south of the Tweed, the fact has never come within our knowledge.—ED.

FERRO-CONCRETE.

SIR,—Reinforced or ferro-concrete systems of construction, although especially suitable for use in the erection of fire-resisting buildings, do not supply any new principle for protection against the action of heat; therefore, precautions, shown by experience to be necessary to secure fire-resisting qualities in other methods, must also be observed when erecting buildings with these newer systems, if protection against the action of fire is required.

The precautions referred to are now well known, being chiefly:—

(1) The use of incombustible materials that do not change to any important extent under the action of fierce heat and sudden cooling by powerful streams of water, and of careful workmanship properly applied.

(2) Complete encasement of all constructional metal with a non-conducting fire and water-resisting substance not less than 2 in. in thickness, secured so as to retain its position under the action both of great heat and streams of water.

(3) Limitations of buildings, or their securely separated compartments, to a moderate area and capacity, regulated by the nature of their contents.

(4) Protection from fires may occur outside the fire-resisting building.

It will be a great misfortune if, by taking liberties with these new systems of applying materials, they become discredited, as is now the case with earlier forms of so-called "fire-proof" structures, which practical firemen have found, when their contents are freely burning, to be the most dangerous and difficult buildings they meet with.

The importance of these precautions was shown in the case of the Fidelity & Guarantee Company's building, No. 111, East German-street, Baltimore, involved in the conflagration of February last. Part of this building, having basement, four stories, and attic, covering a ground area of 1,700 super. ft., was constructed in ferro-concrete, broken granite being used for the aggregate, with the result that exposed angles of the concrete in piers and beams, where subject to considerable heat, split off, exposing long lengths of the metal reinforcing rods.

With a continued high temperature, which may be the case when the stories of a building filled with combustible goods take fire, the tensile resistance of the metal would be seriously weakened, unless duly protected, leading probably to collapse. The action of

the concrete under heat also shows that better results would be obtained by rounding off all external angles in place of finishing them with a sharp aris.

In August, 1903, a fire test was made of a floor formed with reinforced, trussed, hollow concrete beams placed side by side; 5-16 in. iron reinforcing rods were embedded in the concrete, which was composed of sand and Portland cement, three to one; the thickness of concrete, from its surface to the metal rods, was about $\frac{3}{4}$ in. The floor was loaded equal to 224 lb. per foot.

When the temperature had reached 1,940 deg. Fahr., to which it had been raised from 64 deg. in 105 minutes, five out of the fifteen beams included in the test collapsed.

J. SHEPPARD.

December 5, 1904.

LONDON ANTIQUITIES: COLLECTION AND GUARDIANSHIP.

SIR,—At a recent meeting of the London Topographical Society, Mr. Hilton Price referred to a collector of antiquities by James Smith, a "coistermonger" who made large collections of antiquities and sold them entire when he could not store any more. I am informed that he was a Whitechapel dealer in old iron, etc., who was well known to excavators, and promised them good value for any articles discovered, of the genuineness of which he was a good judge.

It is indeed a matter of surprise that such a subject should have engaged the attention *con amore* of an illiterate man like "Totty Jim," the cognomen he acquired from the bag attached to his barrow for the deposit of the relics he bought. I understand that some of the "finds" are now in the Guildhall Museum, but cannot say anything of their description or importance; perhaps some of your readers can give information and say whether his collection was dispersed at his death. It seems strange that there is no official arrangement for securing all objects found in each borough, and that it should be possible for an amateur like Smith to make large collections.

Whether from want of space or of interest, it would seem as if there is no great anxiety to add to the City collection, nor much care shown in exhibiting and cataloguing it. Several years ago Mr. Longman, of Whitechapel, presented an interesting piece of sculptured Purbeck marble found on the site of Holywell Priory, Shoreditch. It is part of an effigy of a mediæval bishop from a table tomb, in the left hand the crozier staff and the right hand upraised in the act of benediction, both being gloved. It had a small corbel on one side of the shoulder with an unmistakable Gothic cap, a roll and hollow round the edge, and faint traces of colour in the folds of the drapery.* After lying for a long time without a descriptive ticket, it is now labelled "Portion of a male figure, probably Roman"! Another object, part of a XIVth century Gothic door jamb, is labelled "Portion of a fluted column, Roman period"! In the elaborately-illustrated catalogue, priced 1s. (and I am told some years in preparation) one would hardly expect any Roman-cing.

If this letter is not already too long, I should like to add that it is gratifying to antiquaries to find recently more toleration on the part of architects towards this study, which has been the subject of much cheap disparagement from some who, I fear, mistake oddity for originality in design. As witness, I would name a recent meeting of the A.A. when papers read were of an entirely antiquarian character. Can it be the unsuspected influence of the old Revivalists which lingers still around the spot that was the centre of their hope for a permanent school of English architecture which should push out the exotic from Italy for ever?

E. W. HUDSON.

ARCHITECTS' DRAWINGS.

SIR,—Your repeated advice to architects to join together with a view to obtaining a satisfactory judgment on the principles involved in the Gibson v. Pease case ought to bring about the desired result, though the lethargic isolation of architects referred to by "A Provincial Architect" is anything but a negligible factor. The question of drawings has been in an unsatisfactory state so long that it is specially desirable that the present opportunity of respecting it should not be allowed to slip.

My own practice is to insert a clause in every specification as hereunder given, and I have been able to point to it on more than

one occasion with satisfactory effect. The clause reads thus:—

"All drawings, tracings, specifications, quantities, papers, and copies thereof whatsoever are, and will remain, the property of the architect, and any given to the contractor must be returned to the architect in reasonably good condition on demand or otherwise at completion of the work."

I enclose cheque of 1l. towards the appeal. G. A. HUMPHREYS.

SIR,—As a careful reader of your valuable paper for the last twelve years I have constantly noted the curious lack of appreciation of the position of the profession as evidenced in your legal reports.

The present opportunity of endeavouring to vindicate our right to our drawings is one which must not be allowed to pass, and I trust that your spirited action in this matter may receive the support of all architects—whether members of the Institute or not.

I therefore have pleasure in enclosing cheque herewith for 2l. 2s. as the contribution from

QUARTER SCALE.
* * * We have received contributions from various architects towards what we will call the "Architects' Defence Fund" (including ten guineas from Mr. A. W. S. Cross and the same sum from Mr. Hubbard), which have been acknowledged by letter, but we should like a longer list of subscribers before publishing it formally. We have more to say on the subject next week.—Ed.

FAMAGUSTA.

SIR,—I have just recently seen a copy of the *Builder*, of date July 9, 1904, and have been much interested in the article on the churches in Famagusta, Cyprus, from which country I have recently returned home. I have some full-plate photographs of the ruins of Famagusta, which I shall be pleased to lend you for reproduction in your paper if you so desire.

The correspondent who wrote the article is, I think, somewhat mixed in his description of the various churches. The Cathedral of Famagusta (of which no mention is made) is Santa Sophia, built 1500-1512, now used as a mosque. It was, when a Latin church, called St. Nicolas. The church of which a plan and elevation are given on pages 32 and 33 is now almost a complete ruin, practically only the end walls standing. The church which is now used as a grain store, and which is the most complete, is known to the Greeks as SS. Peter and Paul. The church shown on pages 32 and 33 is dedicated to St. George, the patron saint of the island. All the churches were Christian, and at the Turkish Conquest, in 1570, the Church of St. Nicolas was turned (probably then) into a mosque, and called by them Santa Sophia. The same fate has happened to the once Christian Cathedral of Nicosia. FROM CYPRUS.

THE JOINERY TRADE.

SIR,—I am very glad to see the letters in the *Builder* of "A Shop Foreman" and "Mill Foreman" respecting the above, and as it shows they take an interest in their trade. On reading these, I do not think I was explicit enough in my letter to you, which appeared in your issue of December 3. My reference was to the foreign-made doors, and sashes, and frames of which we see so much used in the houses now being erected by the speculative builders on the new building estates in the suburbs, not to doors, and sashes, and frames made to the architect's detail drawings.

I will now give my experience. I have built several blocks of model dwellings, in which there have been used some hundreds of doors, sashes, and frames of which we see so much used in the houses now being erected by the speculative builders on the new building estates in the suburbs, not to doors, and sashes, and frames made to the architect's detail drawings. The quotation I received for these doors, foreign made, was 5s. 6d. each, and 4½d per ft. for the sashes and frames. I made several hundred of the doors in my own shops, also several hundred feet of the sashes and frames, but failed to get them out at the figure quoted by foreigners. Are "J. C. W." "A Shop Foreman," or "Mill Foreman" able to do so? I did not work piecemeal, the foreigner does. A LONDON BUILDER.

QUEEN VICTORIA MEMORIAL, LIVERPOOL.—The executive committee of the Memorial Fund have inspected and approved the clay model of the statue designed by Mr. C. J. Allen, of Liverpool, and decided that the model should be sent to the founders for the casting of the statue.

Illustrations.

THE ROOD LOFT OF THE CATHEDRAL OF SAINT JOHN, BOIS-LE-DUC.



HIS *jubé* is now preserved in the Victoria and Albert Museum, South Kensington, where it was re-erected in 1871. It formerly stood at the crossing of the Cathedral of Saint John (St. Jans-kerk) at 'S Hertogenbosch. 'S Hertogenbosch (called by the French Bois-le-Duc) is the capital of the province of North Brabant, Holland. The Cathedral is one of the three most important mediæval churches in Holland, the other two being the Cathedral of Utrecht and the Church of St. Nicholas at Kampen, both of which it surpasses in richness of treatment. The greater part of the present building was commenced in 1418, at the time of the rule of the Dukes of Burgundy, a period memorable in the history of Low Country architecture (*vide* "De St. Janskerk te 'S Hertogenbosch," 1900). In the year 1517 the work was completed; and about a century later, when the Gothic manner of building had been entirely superseded by that of the Renaissance, the rood loft that forms the subject of Mr. Swarbrick's drawings was erected. The materials employed were alabaster, with black and red marbles.

In the article entitled "La Cathédrale Saint Jean à Bois-le-Duc (Hollande)," by J. C. A. Hezenmans, in the "Bulletin Monumental," (vol. xxxix., 1873, page 631), it is stated that the original *jubé* was damaged by the Iconoclasts in 1566, and demolished in 1610, in order that the Renaissance *jubé* might be erected. "This, in turn," added the writer, "was unfortunately destroyed at the instance of some unintelligent people a few years ago; I regret its loss in spite of the unhappy effect of its colossal proportions on a church whose general aspect gave an impression of elegance and lightness." An earlier contribution by Monsieur Charles Piot, entitled, "Le Jubé de la Cathédrale de Bois-le-Duc (Pays-Bas)," appeared in the "Bulletin de la Commission Royale des Monuments" (Bruxelles, vol. vi., 1867, page 43); and was accompanied by a lithograph of the *jubé* in its former position in the church. In this article the reasons for its demolition were stated and some particulars of the structure itself given. The twelve chandeliers of copper were attributed to Antony, son of John, beater of copper at Bois-le-Duc; and the shields held by some of the figures are stated to have been formerly enamelled. According to Maubuchius ("Beschrijving van Sint-Janskerk te 'S Hertogenbosch," page 57), it is insisted the subject of the enamelled decoration was the Spanish coat-of-arms. Extracts obtained from the Bois-le-Duc archives, through Dr. Cuyppers, are also stated to show that the sculptor of the rood loft, Conrad van Nuremberg of Namur, received the citizenship of Bois-le-Duc in 1608. He was probably a son of Conrad, master-mason to the County of Namur (1571-1594). Two designs, it appears, were suggested for the Renaissance rood loft, and the one copied from the structure at Antwerp, by Raphael Vandon Broeck, was accepted on December 13, 1610. It is also recorded that Van Nuremberg received the contract on December 21 of the same year, and that the work was finished in 1613.

The drawings are by Mr. J. Swarbrick, of Manchester, and obtained the Royal Academy prize this year for architectural drawing.

HOUSE AT MUNSTEAD, SUREY.

The house is faced externally with Bargate stone and Portland cement rough cast. Bath stone being used for the window mullions, etc. The roof is covered with local tiles. The chimneys are red brick in small courses.

The builders were Messrs. Wm. Johnson & Co., of Wandsworth Common, S.W., and other work was executed by the following firms:—

Plumbing and heating apparatus by Messrs. Wenham & Waters (Croydon); sanitary work, Messrs. Doultons; casements, Messrs. Crittal & Co. (Baintree); lead glazing, Messrs. H. Hope & Son (Birmingham); and all metal work by Messrs. Ramsden & Carr (Fulham).

Mr. E. W. Mountford is the architect.

* See sketch in R.I.B.A. Journal, vol. v., p. 234.

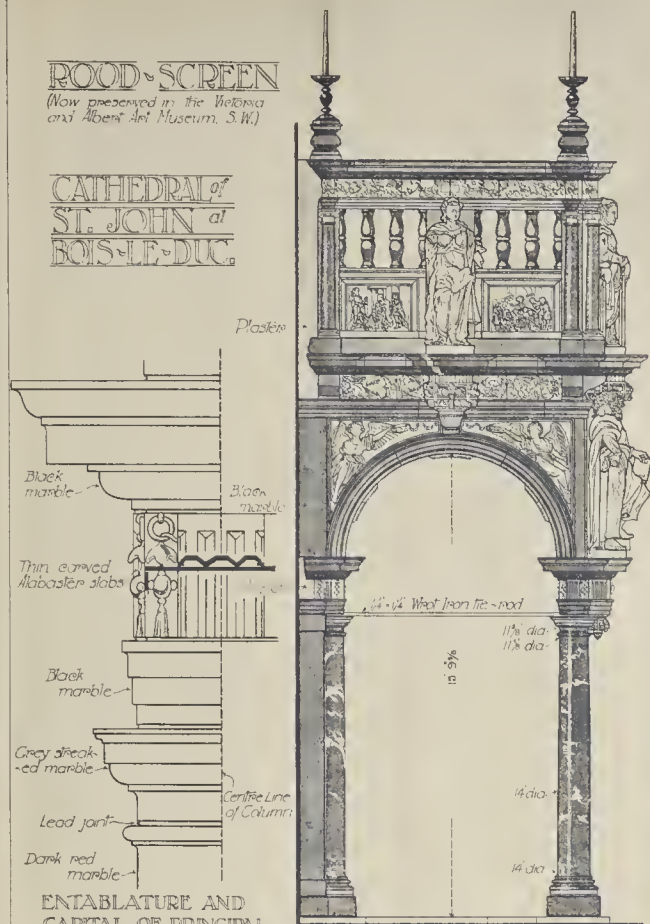


Details of Screen, St. John's Church, Bois-le-Duc. Drawn by Mr. J. Swarbrick, A.R.I.B.A.

ROOD-SCREEN

(Now preserved in the Victoria and Albert Art Museum, S.W.)

CATHEDRAL of ST. JOHN at BOIS-LE-DUC.



ELEVATION, FORMERLY FACING NORTH.

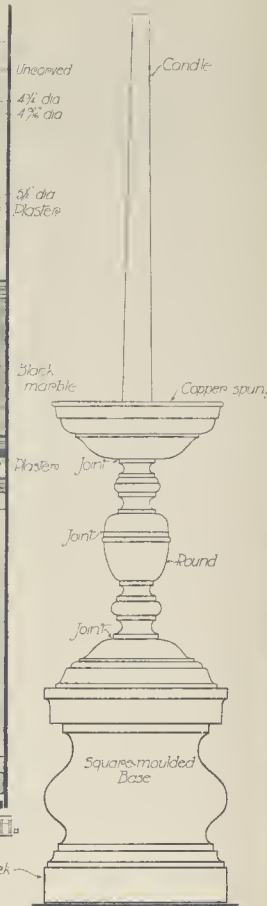
Modern brick filling



SECTION, FORMERLY LOOKING SOUTH.



ELEVATION, FORMERLY FACING SOUTH.



CANDELABRUM. 1/2 FULL SIZE.

The whole of the mouldings etc. have been reduced from accurate full-size details.

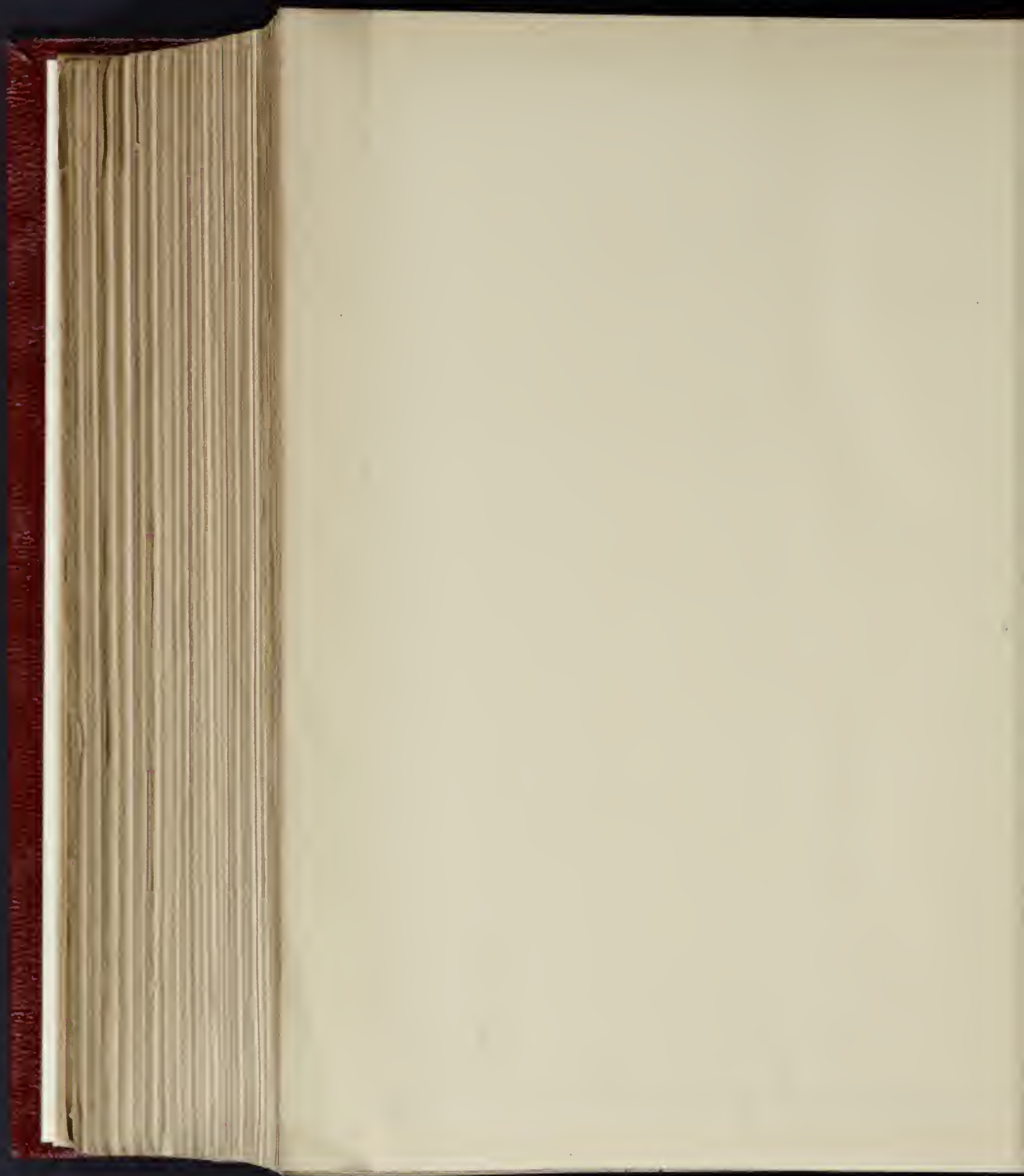
ENTABLATURE AND CAPITAL OF PRINCIPAL ORDER. (1/2 FULL SIZE).



Two designs were originally suggested. The one executed was selected from these. It is stated to be a copy of a sculpture of Antwerp, by Raphael Kander, Brueck (Vide M. Charles Piot in Bulletin de la Commission Royale des Monuments, Bruxelles, 1867).

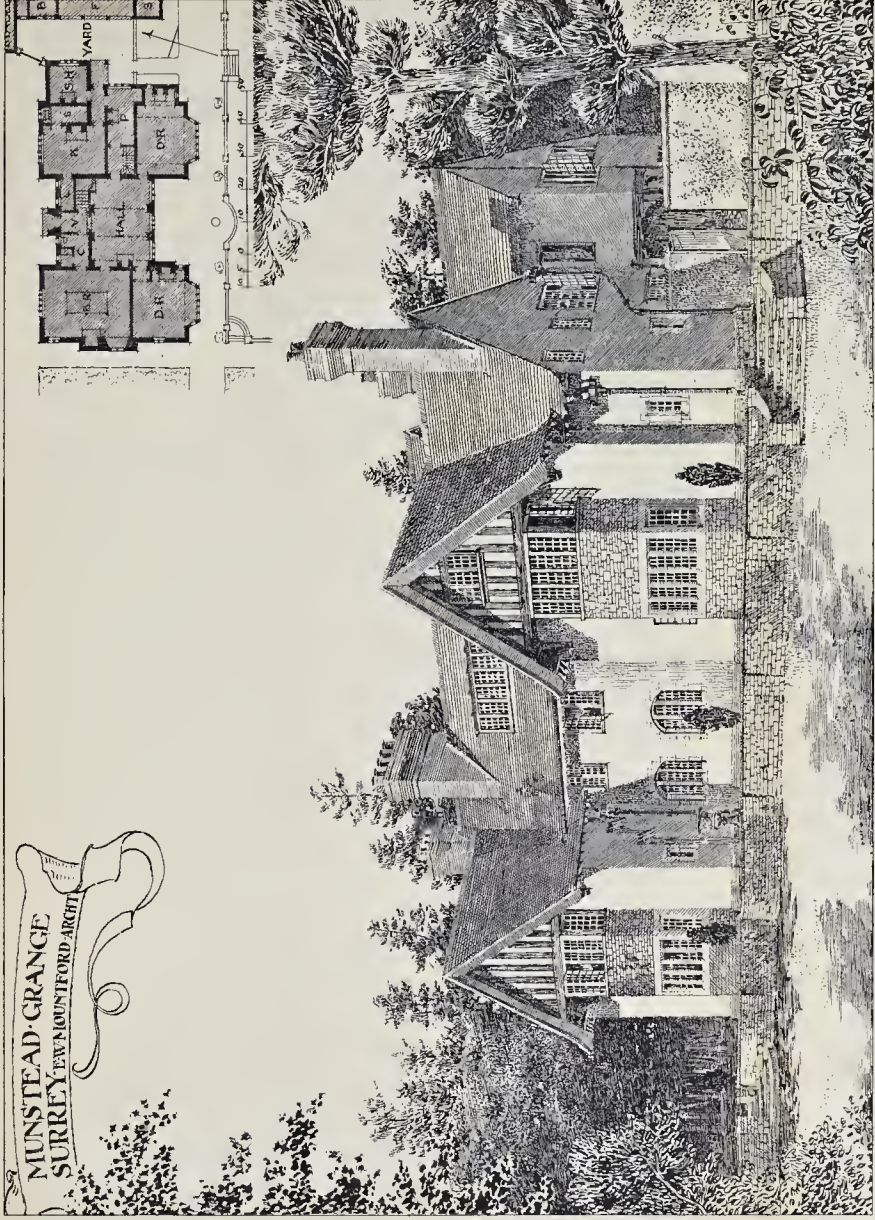
THE ALTAR INSCRIPTION (1/2 FULL SIZE).

DEO . OPT . MAX .
 ET DIVÆ VIRGINI MARIE, SANCTISQ; COSMÆ ET
 DAMIANO MARTYRIBUS, HOC ALTARE AMORIS, PIETATISQ;
 ZELO, CHIRVIRGI BVS CODVCENSES POSVERE, A 1673

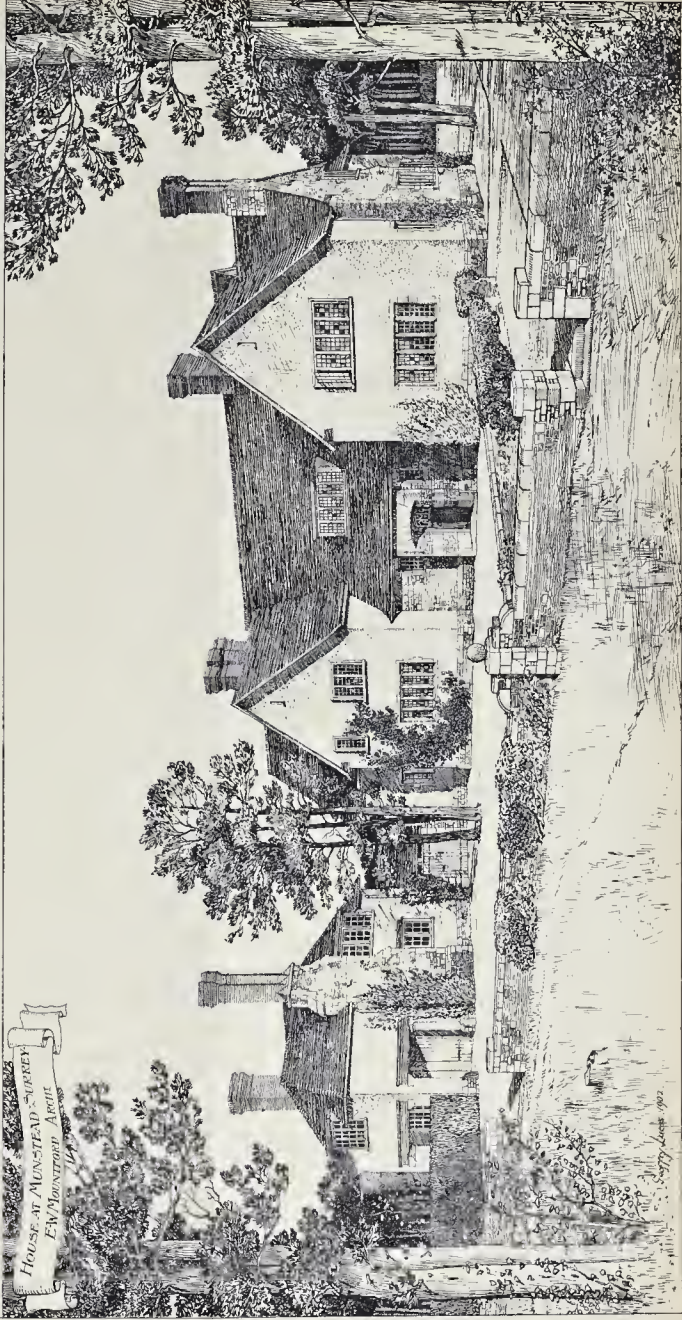


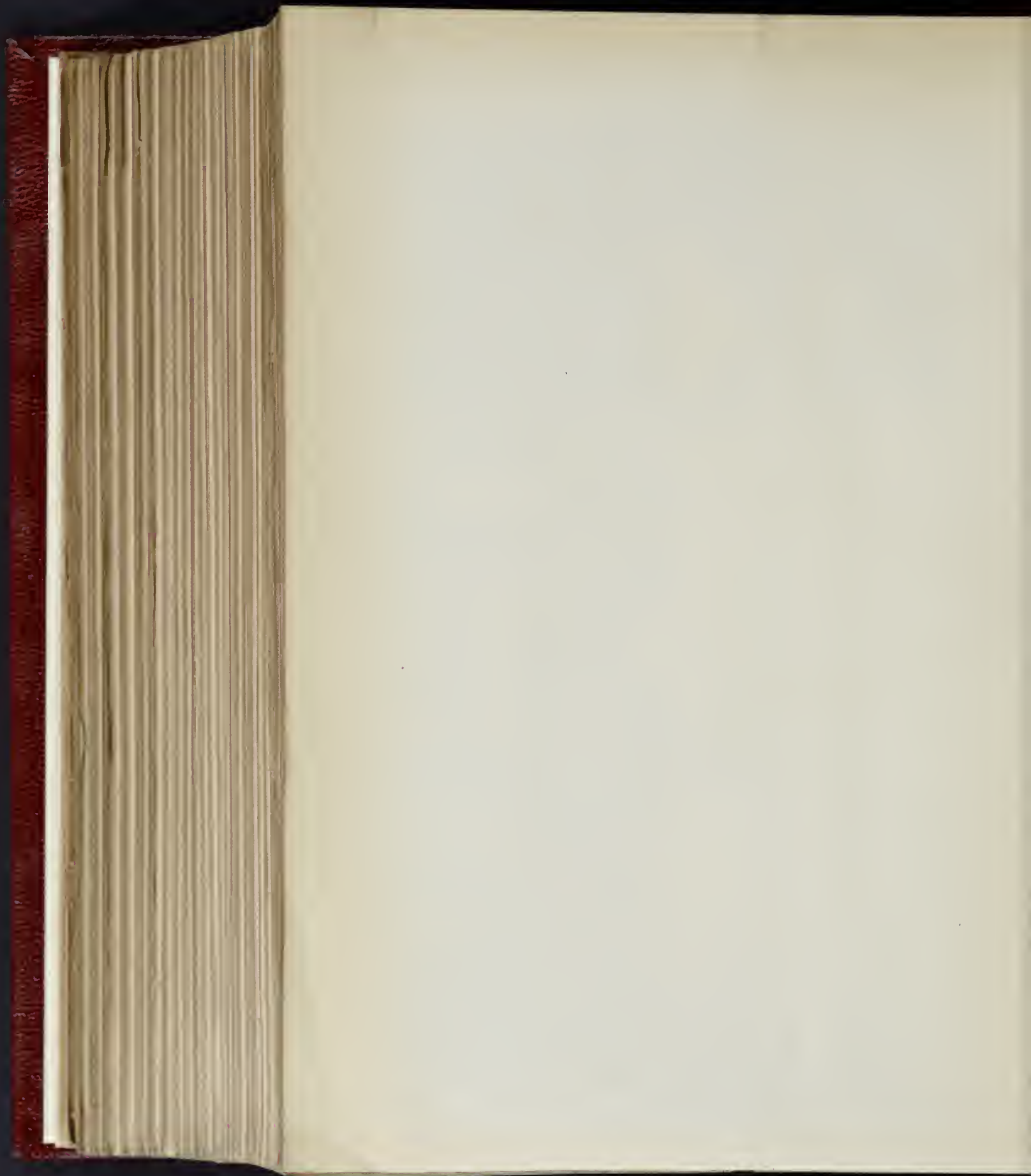


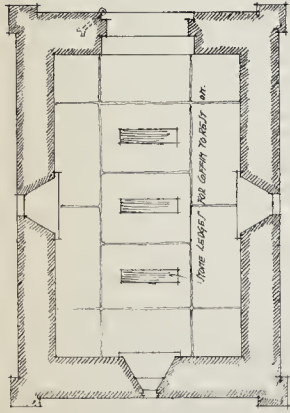
MUNSTEAD GRANGE
SURREY
E. W. MOUNTFORD ARCHT.



House at MUNSTEAD, SURREY.
E. W. MOUNTFORD, Architect.

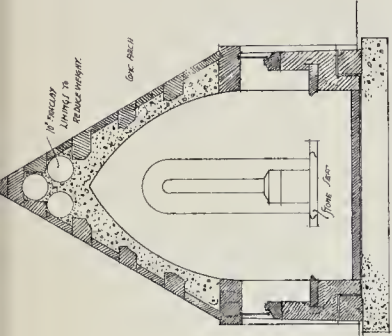




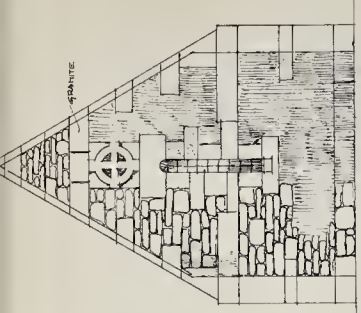


GROUND PLAN

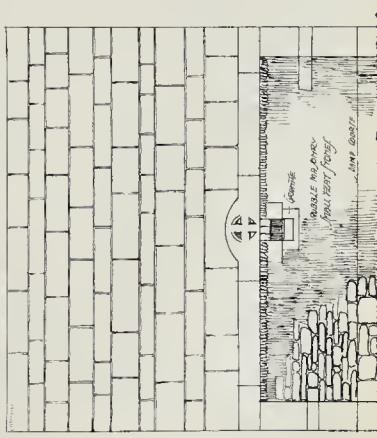
SCALE
0 1 2 3 4 5 10 FEET



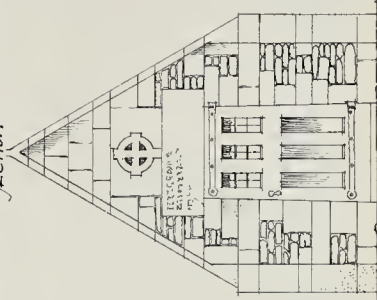
SECTION



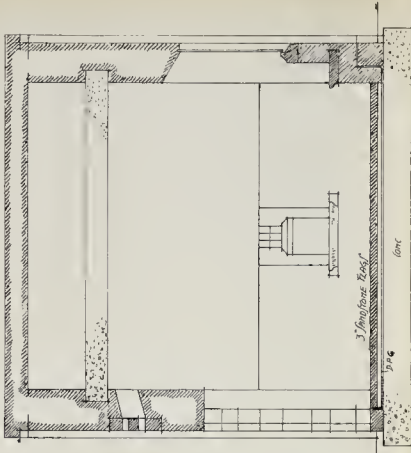
END ELEVATION



SIDE ELEVATION



FRONT ELEVATION

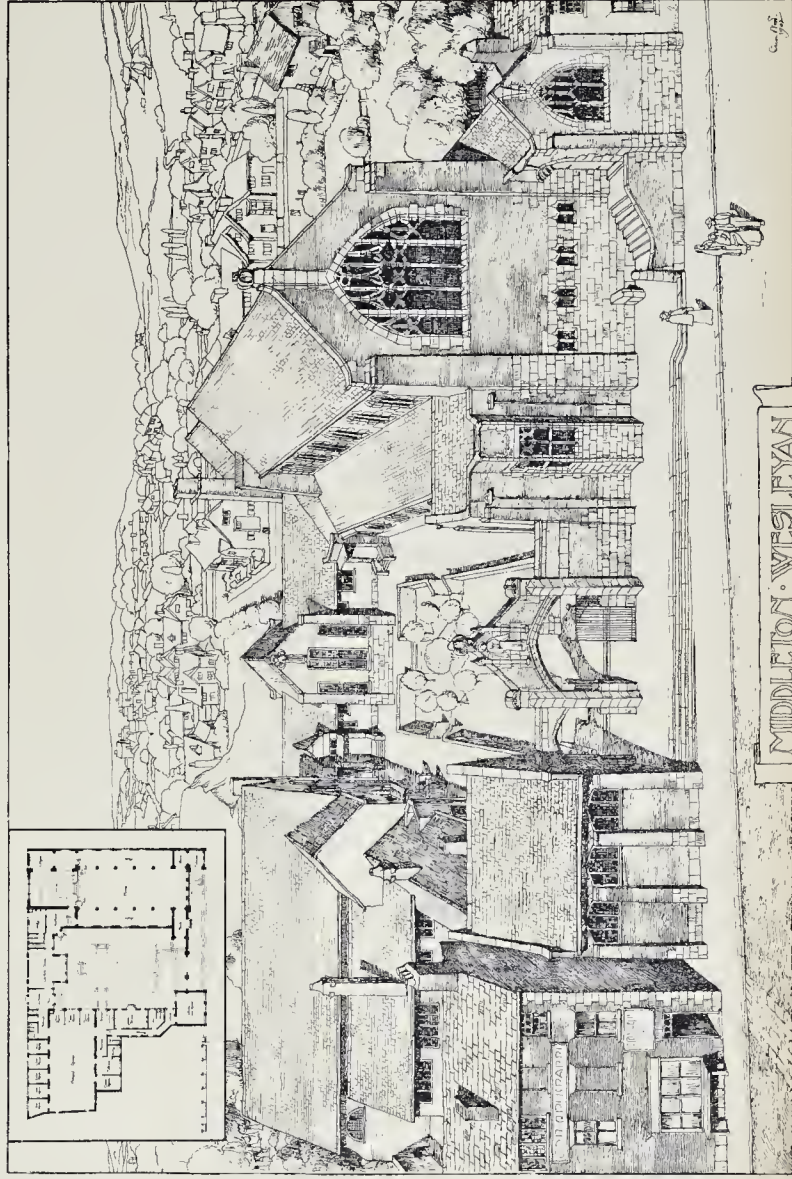


LONG SECTION

THE OGROVNEY MEMORIAL TOMB, MAYNOOTH — MR. W. A. SCOTT, A.R.I.B., ARCHITECT

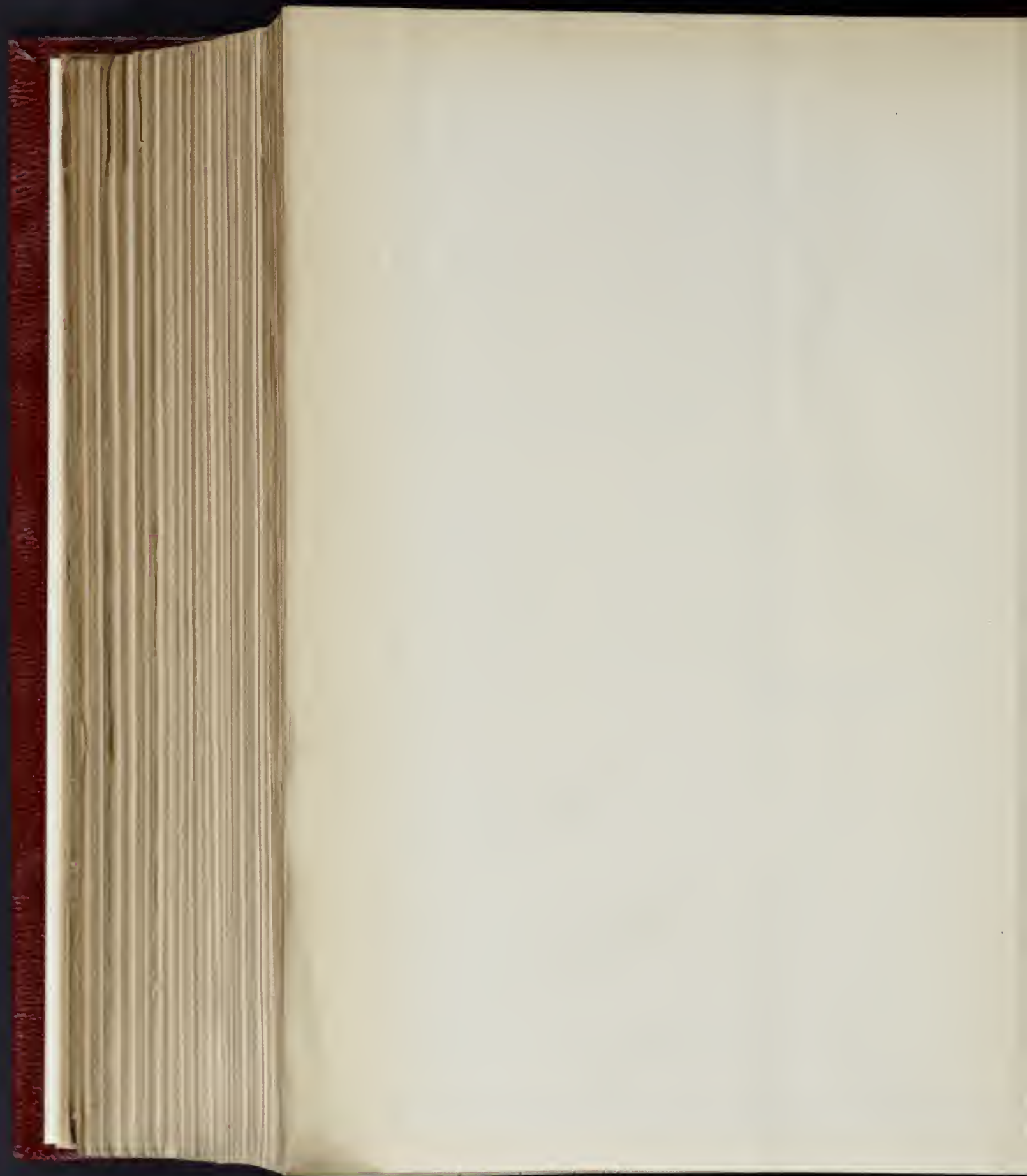
PHOTO LIND SPRAGUE, E.C. 11, 45 EAST HARRISON STREET, FETER LANE, E.C.

THE BUILDER, DECEMBER 31, 1904



MIDDLETON WESLEYAN
CHURCH & SCHOOLS
EDGAR WOOD
ARCHITECT
PLASTERER

PHOTO LIND SPRAGUE, E.C. 11, 45 EAST HARRISON STREET, FETER LANE, E.C.



THE O'GROWNEY MEMORIAL TOMB.
MAYNOOTH.

This is a rather unusual kind of memorial tomb, designed with a stern simplicity based on the suggestions of ancient Irish architecture. Everything about it has been made as solid and as imperishable as possible; concrete foundations, granite quoins at the angles, and a massive door of teak. In the upper part of this door are small lights made of bottle glass set in small bronze frames. The door is hinged also on bronze hinges.

Simple as the work is, it is the result of thought and an effort to produce something essentially monumental in character. The architect is Mr. W. A. Scott, of Drumcondra (Dublin), whose interesting church at Spiddal we illustrated a few weeks ago.

WESLEYAN CHAPEL AND SCHOOLS.
MIDDLETON.

The materials used in these buildings are common brick and warm-coloured stone with broken colour from the Runcorn district; the roofs are covered with stone slates. Many of the school buildings facing the quadrangle are finished in cement and whitened. The walls of the chapel inside are finished with common brick. The chapel and school have open timbered pine roofs.

The heating and ventilation are divided into two systems of the same type, the warm air being drawn in by the cold air being drawn out by the action of the heating of the air in the two ventilating shafts.

The seating accommodation of the chapel is for some 600 persons, with fixed pews and chairs.

The cost was 9,500*l.* for the total; the original site was very uneven, and a large portion had to be excavated to the extent of some 17 ft. in depth.

The principal contractors were Messrs. Nichol & Son, of Rochdale. The architect is Mr. Edgar Wood, of Manchester.

Books.

The Timbers of Commerce and Their Identification. By HERBERT STONE, F.L.S., F.R.C.I. London: W. Rider and Son, Ltd.

This is an excellent and useful book, though with some serious blemishes. Its object is to describe those properties of the timbers of commerce by which they may be most readily identified and distinguished one from another, and many of those properties, such as colour, smell, taste, degree of hardness, etc., are, of course, extremely difficult to describe on paper, especially since they are often liable to wide variation in woods of the same species. Of padouk, for instance, we are told that its colour is "rich red or crimson streaked with black" and "that its smell is little if any"; but, in the present writer's experience, the colour is often brown, whilst the smell, at all events of the red variety when freshly cut, is strongly aromatic. According to its degree of hardness, each wood is assigned to one of eight grades, of which ebony is placed in the first, oak in the sixth, and pine in the eighth; and here again, so far as English oak is concerned, we should very much doubt whether its hardness, as compared with that of ebony on the one hand and pine on the other, is placed high enough up the scale. Dry weight or density is easily ascertained and recorded, but liable to such variations in woods of the same species, and even in different parts of the same tree, that it is of little value for the purpose of identification. Roughly speaking, the higher the latitude in which a given species is found, the harder and heavier its wood is likely to be; whilst, as Goethe observed to Eckerman, wood on the north side of a tree is generally harder and heavier than that on the south, and was more highly valued for many purposes on that account by those old-fashioned craftsmen who loved to make their work as perfect as possible in all respects.

The means of identification mainly relied upon by the author of this book is, however, the anatomical character of the wood as studied through a microscope or pocket lens in the cross-section; and the work accordingly is admirably illustrated throughout by a series of photo-micrographs of these sections, carefully prepared for the purpose by Mr. Arthur Deane.

So extremely diverse in character are these beautiful, and necessarily faithful, figures, which will themselves bear further magnification through the pocket lens, that here at last, we are inclined to suppose, is an infallible method for the identification of all known woods; but here again in many cases we are destined to disappointment. In the first place, 179 figures have to serve for 247 species of wood—one figure, for example, for four species of oak—so that it would seem to be admitted that identification by this method is only possible up to a certain point. Now, as a matter of fact, the most business-like attempt yet made at the classification of woods—the key to the more important exogenous woods of North America, published by the U.S. Department of Agriculture*—also bases its distinctions mainly on the magnified cross-section, and clearly distinguishes the American red from the American white oak by this method, the distinction in the size and number of the pores alone being easily visible to the naked eye. It seems, therefore, somewhat remarkable that the same figure should have been used to illustrate three American, as well as the European, species of this most important tree. We take Mr. Stone's word for it that there is only one European species of oak, but the European varieties at all events are so diverse in value and character that here again greater elaboration of treatment would have been very desirable. Both British and Continental subvarieties of *Quercus pedunculata* and *Q. sessiliflora* are treated under a single heading, the only means given of distinguishing between the former and latter variety being that which concerns their barks. Now, as regards the former or "white oak," the English wood is so much heavier, harder, and "stronger" than the imported kinds, so much more difficult to use, and so much superior on account of its greater durability and finer surface, that, whereas the large majority of furniture manufacturers who aim first at rapid and cheap production will have nothing to do with it, modern craftsmen who consider the quality rather than the price of their work are seldom content with the Continental substitutes. A distinction between the two kinds, therefore, is clearly possible, and it would have been interesting to have had it defined by so scientific an observer as Mr. Stone. Whether the same distinction obtains between the British and European varieties of the brown oak we do not know, never having seen a specimen of the latter variety; but both in England and on the Continent *Q. pedunculata* and *Q. sessiliflora* are generally distinguished very sharply, not only in the attachment of their acorns, but by reason of the colour of their wood, the vulgar appellations "white" and "brown" being found in most European languages. In England, at all events, this difference of colour is often very pronounced; that of *Q. pedunculata* when freshly cut being of a brown so pale as to be literally almost white, whilst that of *Q. sessiliflora* is a deep rich brown, sometimes approaching coffee colour. This difference of colour, however, is quite unnoticed by Mr. Stone. Perhaps he inclines to the theory that the rich brown colour is not characteristic of the so-called brown oak, but occurs, perhaps in either variety, merely as the result of incipient decay, or of growth in some peculiar soil. Yet on this question again the opinion of an expert would have been most desirable.

If the oaks are insufficiently treated by Mr. Stone, the mahoganies are a class of wood by which he is frankly puzzled. He comes to the conclusion that very few of our commercial mahoganies are the wood of the true mahogany, *Swietenia mahagoni*, but that they are mostly cedars and cedrelas. The grand commercial distinction between "Spanish" and "Honduras" he sees barely to recognise; and, on comparing sections of these easily distinguished woods through a pocket lens with the figures given in this volume of *Swietenia*, *Cedrela*, and *Cedrela*, the present writer is unable to come to any useful conclusion. At all events, the distinction between the cold, hard, heavy "Spanish" wood, with its plainly visible white pores, and the lighter and softer baywood is a very real one, and will serve for all practical purposes until the difficulties raised in this volume can be cleared up.

Although Mr. Stone's main object is avowedly to provide a key for the identification of timbers,

he also devotes a paragraph in his description of each species to its actual or possible uses; and perhaps this part of his work leaves more to be desired than any other. It was not, of course, to be expected, in describing such a number of species, that he should go into those details of breaking strain, etc., which Laslett attempted to supply; but if, as appears from the insertion of these paragraphs, he wishes to advise the intending purchaser with regard to the selection as well as the identification of woods, he often omits information which might have been easily given, and which is essential to that purpose. He tells us, for instance, that one wood is inclined to warp and shrink in a great, another in a less degree; but this very important information is frequently omitted even in the case of woods in the most general use, such as oak and mahogany. We ought surely to have been told that the last-named is perhaps of all woods the least liable to give trouble, and oak one of the most dangerous, in this respect; we ought to have been told, what many joiners and timber merchants are often grossly ignorant of, that all woods are much less liable to warp or shrink in radial than in tangential section; so that the method of cutting oak on the quarter instead of plank-wise is even more valuable for the constructive than for the decorative advantage which is so obtained. This point needs strongly insisting on. A further reason for the practice of quartering, which the present writer has never yet seen stated, is that oak, and probably other wood, planes up at least three times more easily when the rays are parallel than when they are perpendicular to the surface planed. The old carpenters understood these advantages so well that their oak panels were usually cut with wedge-shaped sections radiating from the centre of a good butt; but the practice even of quartering is now almost entirely discarded by English timber merchants. In conversation with one of them upon this question the writer was told that one reason against the practice of quartering is that oak so cut might be mistaken for Continental wainscot; the mournful inference being that if a tree is cut up in the right way it was not cut up in England!

It appears thus that, except for tyros and amateurs, this volume has little useful information with respect to the better known classes of wood; but, as the author observes in his preface, the most experienced man will sometimes come across timber with which he is unacquainted, and then, no doubt, he would find the here useful clues to its identification. The book, moreover, should be possessed by all those who are interested in the subject, if only as a stimulus to further inquiry; and no more fascinating study than that of the various species of timber could well be undertaken by anyone with spare time and in need of a hobby. The great difficulty of studying imported or even native woods in the timber-yard arises from the fact that the leaves, flowers, fruit, etc., are seldom available; and it is by these, after all, that the species must be finally determined and classified. What is wanted next is a work illustrated with magnified cross-sections side by side with their appropriate foliage; but for this we shall probably have many years to wait, and, meanwhile, Mr. Stone's volume will certainly be regarded as a standard work on the subject he has so courageously tackled.

A History of English Furniture. By Percy MacQUOD. Vol. I, Part I and II. London: Lawrence and Bullen. 1904. 7s. 6d.

This sumptuous work is to be issued in about twenty monthly parts. The first part of the first volume contains an interesting preface indicating the divisions and subdivisions of the work. The main divisions are four. The first period to be dealt with is from 1600 to 1660, which the author calls the "Age of Oak," showing the evolution of the Renaissance from Gothic; the second dates from 1660 to 1720, when decided English characteristics are first evident; this period of the Restoration and Dutch influence Mr. Macquod calls the "Age of Walnut"; the third period, 1720 to 1770, the "Age of Mahogany," is much affected by contemporary French work. The years from 1770 to 1820 will be entitled the "Composite Age," the age of the classical revival and see-saw taste, the forerunner of the unprincipled and unbalanced fashion from which we are but now emerging.

It comes rather as a shock to be told that

* Bulletin No. 10, U.S. Department of Agriculture, Division of Forestry.

nearly all the early furniture was, until the peace after the wars of Lanca-hire and York, made abroad; and again, that the craftsman was influenced entirely by architecture, and, "being unimaginative, [Lorraine] required detail from either structure, metal work, or textiles; these being all designed, if not actually carried out, by foreigners." No doubt, while the crafts were in the hands of the Church, the principal movers were the clever brothers who travelled from one country to another, learning and instructing; but that does not imply that little interesting furniture was made in this country before 1480, when a cabinet-makers' guild is first heard of.

It is a great pity that there are so few remains of XIVth century work; yet we think Mr. Macquoid might have given us a chapter on work previous to 1500, even in an account of English furniture.

The subdivisions of the "Age of Oak" are three—"Gothic," "Elizabethan," and "Jacobean." For the Gothic period, as already indicated, there are but few examples on which to express an opinion; for the beds and chairs, for instance, we are almost entirely dependent on illustrated histories, romances, and books of Hours. A collection of reproductions of these would be a valuable addition to the literature of this subject. Chapter I. deals with this Gothic period, giving an excellent and most interesting account of the furnishing and disposition of a Gothic house. After drawing attention to the almost universal use of surface colour decoration, rich valances and hangings, and bright and costly cushions, which make us long for illustrations, this chapter describes several fine examples of furniture. The illustrations of these are mostly from photographs, exceedingly well done and reproduced. There are also three coloured plates by Miss Shirley Slocombe. The illustrations show some fine old livery cupboards, with pierced door panels for ventilation, forming a most effective decoration; credence-tables and chests of this period are also given, bringing us to the later period of linen-fold or parchment panels of Flemish origin. The dossier and canopied seat, which was placed on the dais at the head of the room, is only illustrated by the nearest remaining approach to it, *i.e.*, choir-stalls. Mr. Macquoid attributes their complete disappearance to the fact that they were usually fixed pieces of furniture built into the wall of the room.

Chapter II. deals with credence-tables and cupboards. The descriptions of their use is no less interesting than their design. Both these pieces of furniture are evolved from the early chest. Very interesting, too, are the author's remarks on the colour of the oak and its treatment. Varnish was not used in this country until the middle of the XVIth century; Gothic and early Renaissance furniture was neither wax-polished nor oiled, but left untouched. So-called black oak is the result of deep-toned varnish. The latter half of this chapter deals with the beginnings of Italian influence, which becomes markedly apparent in the illustrations. Chapter III. promises to deal with chairs.

The second part, Vol. I., of this sumptuous publication is a continuation of the "oak period." Several fine early chairs are illustrated, as well as some beautiful stools, showing still lingering enchantment of Gothic fancy; these make all the more regrettable the absence of earlier work. With the XVIth century Italian ideas and Italian workmanship pervades everything. A description is given of inn accommodation in the middle of the XVIIth century, besides many domestic details of interest, such as bedding, testers, valances, cushions and embroideries, as well as curious manuscripts giving insight to the manners of our forefathers of this period. XVIIth century furniture shows architectural detail encroaching where it should not. One chest illustrated in the present work represents the elevation of a classic façade; cabinets and chests are naturally more subject to this form of abuse than the less square forms of furniture. Some of the most satisfactory work of the period is the leather-covered chests, bound with brass, and studded in handsome patterns with brass-headed nails; age has lent to these a richness and softness of colour that cannot be easily surpassed.

A considerable portion of this part is devoted to the grand old bedsteads of the Oak period. "Our ancestors considered the price of furniture connected with their birth, marriage, and death as most important, and emphasised this

by a corresponding expenditure of money over it." These bedsteads and their accompanying furniture are especially mentioned in the wills of the nobility and gentry of the period. The illustrations of these are particularly well chosen; indeed, a feature of this book is the subjects illustrated, nearly all being from private collections not accessible to the public. The Part concludes with tables of this period. The fine oak trestle table at Penshurst is shown. It measures 27 ft. long, by 3 ft. wide, and the top has no joint in its length. The Duke of Devonshire's superb walnut table, inlaid with marqueterie, is also illustrated. We read that tables with plain tops, when not in use for meals, were often covered with a fine Persian rug.

How to Collect Old Furniture. By FREDERICK LITCHFIELD. (London: George Bell & Sons, 1904.)

This book is not a history of furniture; there is occasional valuable historic information, but its object is to give elementary and practical advice to amateur collectors of old furniture. It opens with the XVIth century, and gives a concise description of the Renaissance, showing the effect of architectural evolution on furniture. The chest, table, chair, livery cupboards, etc., are briefly described and their origins pointed out. Chapter II. deals with Jacobean furniture, a period of considerable interest, beginning as it does under the refining influence of Inigo Jones, who reduced the exuberant fancy of late Elizabethan design to an agreeable severity. The XVIIIth century saw the wider introduction of upholstered furniture and much greater richness in English furniture, generally owing to its importation from Holland and France. The chapter on Dutch furniture shows how considerable was the influence of Holland, not only by importing direct, but also by the arrival of King William and Queen Mary, who brought many Dutch families to England in their train. The settlement of the Huguenots was also an influence upon the industrial arts of considerable importance. Thus outside influences make it a matter of no slight difficulty to distinguish English from foreign made furniture, and no doubt much of the so-called English furniture of the XVIIIth century is Dutch. The architectural influence is marked during this century; the tradition of both architecture and the crafts was on established lines, and the result is very thorough workmanship and reasonable design.

The chapter on the XVIIIth century is the most interesting. With the Georges we come to a period of makers known by name. The chapter contains much of interest regarding Gillow, Chippendale, and their less-known contemporaries; Heppelwhite, the Adams brothers, and Sheraton. The "drawing" table was not, however, invented by Gillow, who may have patented it, but the idea dates back to Jacobean times. This chapter ends with an account of the painted furniture of the period, and has something to say about polishing.

French furniture played so great a part in the design of all furniture of the early XIXth century that the chapter on the earlier French periods is quite necessary to a knowledge of the subject; we commend this chapter as particularly concise and to the point. It describes the different periods known under the Louis and the methods of the well-known makers, such as Boule, Martin, and Gonthière, concluding with the Napoleonic period. The XIXth century shows the influence of this last period and the general introduction of Greek and Roman details. One chapter deals with "faked" furniture of various kinds, and another with valuable hints and cautions to the buyer, and the book concludes with an interesting glossary and an account of modern dealers' methods in buying and selling. All together the volume is a good handbook to possess on this subject.

Studies in Astronomy. By J. ELLARD GORE, F.R.A.S., etc. London: Chatto & Windus, 1904.

We have several times referred to the articles on astronomical subjects by Mr. J. Ellard Gore, which have appeared from time to time in the *Gentleman's Magazine*. The book before us consists of these and some other articles which have appeared in *Knowledge* and *The Observatory*, collected and revised, partly rewritten and the information brought up to date.

This is an eminently sensible popular book

on astronomy; we say "popular," because it is written for general readers and not for astronomers; but there is nothing "popular" in its style in the wrong sense of the word—none of the sensational paragraphs about the wonders of the heavens by which some writers about astronomy play to the gallery; it is a book intended to give solid and reliable information in plain language, and will be attractive to readers who want information rather than to those who only turn over books for amusement.

Among the subjects treated in separate chapters are "The Size of the Solar System"; "Jupiter and its System" (at present a subject of special interest); "The Distances of the Stars"; "The Sun's Journey through Space"; "The Suns of Space"; "The Darkness behind the Stars"; "The Nebular Hypothesis"; "Light, Electricity and the Ether," etc., etc.

In the chapter on the nebular hypothesis, and in fact in general throughout the book, the author's aim appears to be not so much to put forward any theories of his own, as to give the reader an account of the prevailing and most accepted theories, and the reasons for them. A great deal of the calculation and reasoning on which such theories are built can only be appreciated in detail by those who have had their minds trained in the higher branches of mathematics; by others they must be taken on trust. In this little book the author occupies the useful position of interpreter between the astronomical *avant* and the general reader.

Why, on page 4, does the author, in explaining parallax, say that "the solar parallax is the angle subtended at the sun by the earth's semi-diameter"? Why the semi-diameter? We should have supposed that the most accurate parallax for the sun would be got by taking the largest base possible, *viz.*, the earth's diameter, not the half of that; unless there is some reason in the technics of astronomy for stating it in terms of the semi-diameter.

Municipal Shortcomings. A series of articles contributed to the *Liverpool Journal of Commerce*. By T. MYDDELTON SHALLCROSS. London: Elliot Stock, 1904.

The twenty-five articles, which are reprinted in this pamphlet, have special reference to the city of Liverpool, and although the City Council cannot fairly be held responsible on all the counts of the author's indictment, the articles are well worth consideration. They are written in a popular style, free from technicalities—a method which has its advantages in an appeal to the man-in-the-street, but is not altogether convincing to those who have an intimate knowledge of municipal work. The author's theme is "The unnecessary unhealthiness of Liverpool," and the means whereby the death-rate may be reduced. There can be no doubt that the mortality is greater than it need be, and the author has done a civic service in drawing attention to the fact.

BOOKS RECEIVED.

CITY DEVELOPMENT: A STUDY OF PARKS, GARDENS, AND CULTURE-INSTITUTES. By Patrick Geddes. (Geddes & Co., Edinburgh and London.)

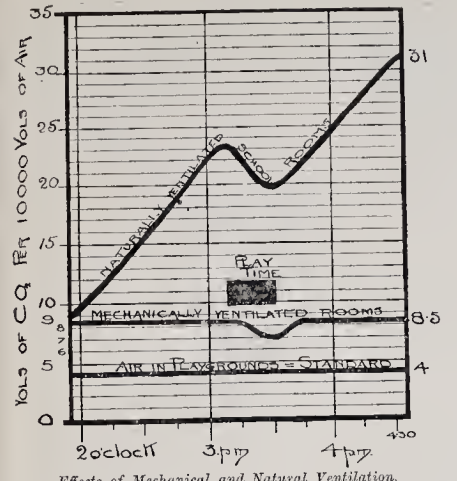
CHINESE ART. By Stephen W. Bushell, C.M.G., etc. Vol. I. (Published by the Board of Education.)

LADY MARGARET HALL, OXFORD.—The Warden and Governors make an appeal for contributions to a sum of £5,000, which is required for the completion of the block containing the dining-hall and library, and of the north wing for residential rooms—known as the Wordsworth Buildings. The hall was founded at Norham-gardens, Park Town, in 1379, as a ladies' college, somewhat analogous to the older colleges of the University. The hall receives fifty-two students. The additional buildings for the chapel, library, and gymnasium were planned and designed by Mr. Basil Champneys. In our issue of February 13, 1897, we published an illustration of the south wing of the Wordsworth Buildings, of which the middle block and the north wing were not then erected, situated beyond Norham-gardens, on the road to the Cherwell. The south wing contains twenty-eight students' rooms, common-room, lavatory and bathrooms. The north wing is also intended for the students. The middle block will contain the main entrance hall and staircase and the dining-hall, with the kitchen and offices below and the library above.

TRADE CATALOGUES.

We have received a pamphlet of forty-eight pages entitled "Healthful Schools: What Engineering Can Do." The author is D. M. Nesbit, of (Leicester), and the pamphlet contains an account of the

method of mechanical ventilation adopted in certain schools in Bradford, Leicester, and elsewhere, and of the results obtained. The author does not enter into details of design and mechanism, but writes in a general way for the purpose of bringing the subject of mechanical ventilation before the notice of all interested in education. Incidentally he draws attention to the ridiculous pamphlet in praise of "natural ventilation" published anonymously a year ago in the style of a blue-book, and also quotes from the discussion at the R.I.B.A. in June, 1904, and from other sources of information. The pamphlet is not an ordinary trade catalogue, but falls rather into this class than into that of "Books." The illustrations include the accompanying diagram of the state of air in schoolrooms in the same building under mechanical and under what is called "natural" ventilation; a practical document which we commend to the notice of our readers.



Effects of Mechanical and Natural Ventilation.

The Mork Patent Pulley Block Co. send us a circular describing their screw pulley blocks with quick return gear, the essential features of which have been mentioned in a previous issue of the *Builder*. They also enclose a leaflet giving particulars of Mork's scaffold chain, consisting of a lock plate and two chains. The plate is made of Siemens-Martin steel, and is so shaped as to cling tightly to the upright pole when the cross pole is suspended, and the greater the weight the firmer becomes the grip of the plate on the upright pole. The chains, being made weldless and of steel wire, are far stronger than ropes, especially when the latter have been exposed to all sorts of weather. This scaffold appliance is extremely simple, and should be a boon to builders and contractors.

We have received from Messrs. Drake & Gorham, of Victoria-street, Westminster, a book entitled "Light and Power," describing many of the arrangements for the electric light which this firm have installed in country mansions. Numerous photographs are reproduced, many of which will be instructive to youthful electricians, and a few are of general interest. Useful hints are given on such subjects as "producer gas plant," oil engines, water turbines, etc. We can recommend this work to anyone interested in installing electric light in a large mansion, as the arrangements of the lights in dining-rooms, picture galleries, etc., shown are instructive, and the power-house illustrations show clearly the magnitude of the plant and the space required for installations of various sizes.

We have received from the Stanley Electric Manufacturing Company, of Pittsfield, U.S.A., a large wall map of California showing clearly the routes of the high-pressure lines which are being used for the transmission of power by electricity. The longest transmission line at present is 232 miles, and the most important one is from Electra to San Francisco, a distance of 147 miles. The mean daily load on this latter line is 10,000 horse-power. The Stanley Company are experts in the transmission of power over great distances, and one of their engineers, Dr. Perrine, has written the standard work on the subject. Stranded aluminium cables are now the type of cable most commonly employed for this class of work. In some cases very long spans of wire are employed. In mountainous districts spans of 1,800 ft. are sometimes made, and have apparently given very little trouble. The pressures employed vary from 40,000 to 60,000 volts.

M'Fear & Co. (Belfast) have sent us a tiny booklet containing descriptions and prices of the felts manufactured by them for roofs, sarking, damp courses, etc. Full instructions are given for fixing, and also for preserving the various felts. Mention is also made of the bow-and-string girder or truss constructed of wood for light roofs.

The Coalbrookdale Company have sent us two sheets containing illustrations, descriptions, and prices of their patent "Speedon" radiators. The general principle of the invention is not altogether new, as gas has for some time been used for heating independent radiators containing hot water. The "Speedon" radiators are heated either by gas or by electricity, each radiator being, according to the description, "a complete hot-water circulating system within itself." The radiators will no doubt prove useful, the principal advantage being that the water retains the heat for some time after the gas or electricity has been switched off. "The Ideal Fitter," an illustrated catalogue, price list, and reference book, has been sent us by the American Radiator Company. It is a new edition, and contains some new features. The contents include illustrations and full details and prices of boilers and radiators of different types for heating apparatus, valves and other accessories, air-gratings, tools, etc. Twenty pages are occupied by useful tables and suggestions on piping and other details of heating apparatus. The catalogue is convenient in shape and size, and clearly printed.

Messrs. Graham, Morton, & Co. (Leeds) have sent us a copy of their interesting catalogue, No. 940, which contains a large number of illustrations of their own works and of conveying plant of various kinds erected by them at home and abroad. The illustrations are the principal feature of the catalogue, the descriptions of the apparatus being of the briefest, and no prices being given. Among the apparatus we notice belt and bucket conveyors for unloading, conveying, and elevating coal, coke, hot ashes, slag, etc.; some of the appliances are decidedly ingenious, and all are devised for the purpose of reducing manual labour and of expediting the conveyance of materials.

From Mr. W. E. Farrer (Birmingham) we have received a copy of a catalogue containing complete illustrations and descriptions of his "improved automatic distributor" for distributing sewage over the surface of small bacteria-beds. The invention consists of a galvanised-iron tipper, which receives the effluent from the septic tank and (when full) discharges it automatically into a series of perforated channels laid on the surface of the filter. The tipper may be either single or double. The latter is arranged so that it discharges the sewage alternately to the right and left, thus bringing two filters into use alternately. For small sewage-purification works, such as those for country houses, the apparatus is well worth a trial. The catalogue contains information which will be of use to those contemplating the erection of such works.

"Hobbies" of Dereham (Norfolk) have sent us their catalogue for 1905, containing illustrations and prices of tools for amateurs, fretwork of various kinds, and some hundreds of fretwork designs for articles of more or less supposed utility.

We have received from Mr. W. Höller a catalogue divided into six sections; the first contains photographic illustrations of oak panelling and other joinery, and the second deals with "art metalwork" of various kinds, including grilles, signs, lamps, and door-furniture. The remaining sections are shorter, and comprise hand-painted tiles, the patent asphalted sheet-lead dampcourse, wall-papers, etc. Many of the designs for oak panelling and metalwork are excellent, and the catalogue as a whole will prove useful as a work of reference for architects and others. The asphalted lead dampcourse has been extensively used abroad, and, as the illustrations show, it is adapted for roofs, tanks, etc., as well as for walls.

Messrs. Chavasse & Kerr (Birmingham) send us their catalogue containing illustrations of various forms of the "Tropicain" patent fire-grate, which gained the Coal Smoke Abatement Society's certificate rather more than a year ago. The grate is simple, the body consisting of corrugated fireclay slabs, and the iron-work being reduced so that it does not appreciably obstruct the heat. There are no front bars. According to the certificate mentioned above, this grate was one of five tested by the Society, and "showed the best results in the diminution of smoke, the heating power of the grate, and the economy of fuel." Any grate which ensures more thorough combustion of fuel than is possible in the ordinary grate, is worthy of a fair trial, and we have no doubt that this will be given to the "Tropicain." The illustrations in the catalogue are far from satisfactory, and will not do much towards pushing the sale of the grate.

The new catalogue issued by Messrs. S. W. Francis & Co. contains illustrations of their various kinds of wood, iron, and steel revolving shutters, brass and other metalwork for shop-fronts, plate-glass and other fascias and stall-plates, iron gates, etc. The testimonials printed in the catalogue range from 1857 to 1901, and the firm is so well known that it is unnecessary for us to describe their manufactures in detail.

The London Warming and Ventilating Co. have sent us their catalogue of firegrates, ranges, etc. It is divided into a number of sections, dealing respectively with plain and tiled register stoves and hob-grates, interiors, mantel registers and iron mantels, wood mantels, dog-grates and urbs, stoves, gas fires, anthracite stoves and grates, and the patent "Record" kitchen range. Perhaps the most interesting open grate is the "Florence," designed for burning anthracite coal. The catalogue is well printed and fully illustrated and priced. Many of the designs are artistic and old-fashioned, but this is what everyone expects in a trade catalogue; good, bad, and indifferent types are collected so that every taste may be pleased.

We have received from Messrs. Doulton & Co. a large and elaborate catalogue of sanitary fittings. The illustrations consist almost exclusively of half-tone blocks carefully prepared from photographs or wash drawings, and printed on smooth paper. Ten illustrations of fitted bath-rooms are first given, and then follows the first section on water-closets, which occupies eighty-four pages. Obsolete closets, such as the wash-out, are not included, but various forms of wash-down and siphonic closet are shown, together with two or three valve-closets; trough-closets and ranges of wash-down closets with automatic flush-tanks are also illustrated. The section on baths runs to 106 pages, and contains an excellent assortment of cast-iron and earthenware baths, shower and spray baths, towel-airers, and other fittings. The next section on lavatories is of almost equal length, and contains illustrations and prices of lavatories of nearly every type, including four views of the lavatories and sinks fitted in the operating rooms of various hospitals. The urinal section (forty-two pages) is also an interesting record of the company's most recent improvements, the first place being given to a series of circular-backed stall urinals in glazed fireclay. In the sink section (forty-two pages) there are illustrations of wash-up-sinks of various kinds, slop-sinks, mortuary slabs, etc. The volume concludes with a short section on cast-iron manhole-covers, gratings, soil and drain-pipes, flush-tanks, etc. The catalogue is a valuable work of reference for the architect and builder, who will find in it fittings suitable for buildings of every class.

Mr. John Jones sends us his new catalogue ("Section List A") of cast-iron drainage

fittings, pipes, etc., among which we may mention intercepting and other traps, and a great variety of airtight cast-iron inspection-chambers, cast-iron chamel-bends and junctions for manholes, drain-pipe bends and junctions, gullies and rainwater-shoes, soil-pipes and manhole-covers. The catalogue contains a comprehensive assortment of the fittings required in connexion with iron drains, and is well illustrated and fully priced.

"Firegrates, Mantels, and Accessories" is the title of a catalogue received from Messrs. Barnard, Bishop, & Barnards. It is divided into two sections, the first dealing with firegrates, mantels, curbs, etc., and the second with kitchen ranges, heating apparatus, boilers and radiators, etc. An interesting feature of Section I is the preliminary series of plans and sections of the seven different types of "fire-basket" made by the firm, the "Victoria" being without iron bars, and the "Economic" having all the angles of the back and bottom well rounded and a very small ash-grate along the front part of the bottom. Many of the numerous designs for interiors, and for cast-iron and wood mantels are simple and artistic. Section 2 is of a more practical nature and contains illustrations of kitcheners, hot-water boilers of various types (including examples of sectional boilers), radiators, etc. The catalogue contains altogether about 160 pages, and is well-bound, clearly illustrated, and fully priced.

Messrs. Wood & Andrews (Manchester) have sent us a copy of the large and interesting catalogue issued by the Metallic Roofing Co. of Canada. It shows the uses to which sheet metal, painted or galvanised, is now put in Canada, and, as far as we know, cannot be matched by the catalogue of any firm in this country. Here, when galvanised iron roofing is required, the old stock corrugated pattern is adopted without a thought that any other design is possible. In Canada there is no such dearth of invention, or fear of innovation. While there is much in the Metallic Roofing Co.'s catalogue to condemn, from an artistic point of view, such as the stamped metal sheets in imitation of rock-faced masonry and the like, there is also very much to praise. It is fully illustrated, the descriptions are complete, details have been thoroughly considered, and the builder will have no difficulty in carrying out the instructions given for fixing the various goods. Among the contents we may mention sheet metal of various designs for roofs and walls, fire-resisting doors, stamped metal mouldings, enrichments and sheets for walls, ceilings, coves, etc. "Hayes" metal lathing, and even pressed metal dressings for windows, dormers, etc. The fire-resisting doors are made in a number of stock patterns, and are very ingenious; they are of wood, in three thicknesses, covered with fireproof paper, and entirely sheathed with sheet metal. Each side of the door is sheathed with a single sheet of metal, which is stamped into panels to fit the wood backing, the edges of the metal being turned back to cover the edges of the woodwork. The catalogue, which runs to more than 350 pages, contains illustrations of many Canadian buildings in which the company's manufactures have been used.

Messrs. Adamsez, Ltd. (Soo.wood-on-Tyne) send us a four-page list containing illustrations, descriptions, and prices of their patent pneumatic closet-sets, in which the cistern is operated by a jet of air entering the hell of the siphon. The air is transmitted from a small bellows, which is actuated by means of a press-button or by seat-action. The device is ingenious, the only moving mechanism being the bellows.

Messrs. G. Kalms & Co. (Brixton) send us a sheet descriptive of their apparatus for drying damp rooms in new buildings. The apparatus contains a chamber in which the air is heated, and thence circulated through the room.

Mr. William Cooper has sent us a sheet containing illustrations and prices of portable houses, studios, and other buildings constructed of wood and galvanised iron. The buildings are of ordinary type, according to the description, "ornamental finish to gables and pinnacles is studied from the most approved Gothic designs," but unfortunately this ornamental finish does not give to the buildings any architectural merit. No fireplaces or chimneys are shown in any of the designs, nor are they mentioned in the descriptions.

Mr. F. Wallis Stoddart's pamphlet "On the best method of sewage disposal for small communities" is not a trade catalogue of the ordinary type, but rather a dissertation on the

subject of sewage disposal in general, with particular reference to the author's patent sewage distributor. This has been described in our columns more than once, and we need only repeat that it was designed for the purpose of distributing sewage uniformly in drops over the surface of percolating filters. The pamphlet contains illustrations and descriptions, not only of the distributor, but also of the other portions of the purification works, including the tank, filter, etc. It is ably written, and well worth the consideration of architects, surveyors, and engineers.

We have received from "Aspinal's Enamel"—this being the name of the company—a little book containing specimens of their "decorators" enamels and "wapieti" washable distempers. There is a good range of colours in each class, and the book will be useful to the architect as well as to the decorator.

From the Brilliant Sign Co. we have received an illustrated catalogue and price list of their manufactures, which include letters of all kinds and sizes in wood, copper, brass, aluminium, glass, etc. The catalogue also shows glazed stall-plates, signs, and fascias in considerable variety.

Mr. George Wragge (Salford) sends us a four-page circular containing illustrations and prices of his "in and out" casement for safety cleaning, and of a small casement ventilator for fixing in one of the squares of lead-light glazing. The former is the more important invention, and is simply a wrought-iron casement pivoted at the top and bottom about 4 in. from one side; thus, in a casement 18 in. wide the pivots will be 14 in. from one side and 4 in. from the other. The larger portion opens outward, and the outside can easily be cleaned when the casement is open, by passing the hand and duster through the 4-in. space. In the case of a three-light window an "in and out" casement in the central light allows two fixed side lights to be cleaned. The sections of the metal used in the casement are somewhat intricate, and we judge from them that the casement will be thoroughly watertight.

Messrs. J. Constantine and Son (Manchester) have sent us a descriptive pamphlet in praise of their convoluted stove for supplying fresh warm air to Turkish baths, houses, and public buildings. The stove has been on the market for the last forty or fifty years, and has recently been used for several important Turkish baths, etc., but the makers are doing themselves a disservice by issuing a pamphlet so badly written and containing expressions so extremely biased and unwarranted. In the preface the authors fall foul of those "warming and ventilating engineers . . . who have strange, dogmatic opinions of some one scheme of ventilation which they are ever ready to apply to any building for whatever purpose it is to be used, to some of which it is entirely wrong and must fail." We commend this curious sentence to the authors' notice, asking them to substitute "warming by convoluted stoves" for the word "ventilation."

From the Edison and Swan United Electric Light Company we have received a catalogue (Section II.) containing illustrations and prices of a variety of electric light fittings and accessories suitable for ships, factories, and mines. The fittings are of simple character, without unnecessary ornament, and are fully illustrated and priced.

Messrs. Lockerbie & Wilkinson have sent us a copy of their catalogue, "G," of rainwater pipes, heads and gutters, soil pipes, ornamental ironwork, etc. The catalogue is admirably got up, and the contents are extremely interesting. Many of the rainwater heads (which are cast in either lead or iron) are of an artistic character, and special attention has also been given to the design of the sockets and ears of rainwater pipes—with excellent results. The "Ducless" patent fixing is an ingenious contrivance for fixing pipes to stand 1½ in. clear of the brickwork. The lead soil pipes, plain and ornamental pipes and tacks being shown. All these goods and also the rainwater gutters are fully priced. The remaining contents of the catalogue are of a more general character, and are introduced for the purpose of drawing attention to some of the other departments of the firm's work.

INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS AND GRAVERS.—The President and Council of the International Society of Sculptors, Painters and Gravers will hold a reception on the evening of Saturday, January 7, at the New Gallery, Regent-street.

OBITUARY.

MR. WIMPERIS.—We regret to announce the death, on December 21, at No. 37, Half Moon-street, of Mr. John Thomas Wimperis, formerly of No. 25, Sackville-street, Piccadilly, and Bolingbroke-grove, Wandsworth Common, in his seventy-fifth year. Mr. Wimperis was elected a Fellow of the Royal Institute of British Architects in 1877. In February, 1889, he took into partnership Mr. William Henry Arber, who had been closely associated with him during the preceding twenty-four years, under the style of J. T. Wimperis & Arber, architects and surveyors. The partnership was dissolved as from June, 1897, on January 1, 1898, when Mr. Arber purchased Mr. Wimperis's interest in, and undertook to carry on the practice of, the firm. Mr. Wimperis was elected in March, 1902, a member of council of the Architects' Benevolent Society, and retired by rotation in March of the following year. Of Mr. Wimperis's more important architectural works we have illustrated the designs and plans of the following buildings:—The Granville Hall, with upper-room and annex, as a completion of the Granville Hotel, Ramsgate (September 12, 1874); Invercauld, Braemar, with extensive alterations and additions, 1870-5, in the "Scottish baronial" style, for Farquharson of Invercauld (June 5, 1875; view, and lower hall); the Sunderland Arms, Sackville-street, for the owners of the Sutton Estate (June 19, 1875); Hatton House, Westgate-on-Sea (June 12, 1886); Duke-street Mansions, Grosvenor-square, on the Duke of Westminster's estate, November 12, 1887; No. 11, Charles-street, Berkeley-square, after the Palladian manner (July 18, 1891); No. 16, Soho-square, for Messrs. Orme & Son (October 31, 1896); Hill House, Hampstead, with alterations and enlargement, for Mr. George Fisher (August 27, 1898, garden front); reconstruction of No. 35, Dover-street, Piccadilly, for the Empress Club, on behalf of the Hotel Club, and Investment Company (September 2, 1899); and designs for the Oriental treatment of the subway connecting two of Messrs. Liberty's premises in Regent-street (May 16, 1903); the subway was subsequently constructed, but with a different treatment. Mr. Wimperis, or the firm, during the period we mention above, prepared the plans and designs for No. 23, Berkeley-square, in 1890; the reparation of the interior and exterior of the parish church of St. James, Piccadilly, with a reinstatement of the roof in 1884, and the new choir vestry in 1899; blocks of houses in Davies-street and South Molton-lane, in 1899-1900; the new Palace Music-hall and Theatre of Varieties, with Thomas's Great Western Hotel, Plymouth, 1899; the enlargement on the sites of Nos. 36, 37, and 38, Jermyn-street of Prince's Restaurant, Piccadilly, with the iron and glass shelter and new grill-room at the east end in Piccadilly, and the reception-rooms and alterations of the Art Gallery, 1898-1901; the new Palace Theatre, Blackfriars, 1898-9; the alterations and the new library, with winter gardens, etc., Forest Lodge, Tulse Hill, for Mr. G. Adney Payne; the Hotel Osborne, Berkeley-street, Mayfair, begun in 1898; additional premises in Dover-street, W., for the Empress Club, opened in July, 1900; buildings on the south-west side of Park-walk, Chelsea, between Chapel-street and Winterton-place, with the widening of those two thoroughfares, for Mr. R. C. H. Sloane-Stanley, in 1898; new works, with alterations and improvements, at the London Pavilion Music-hall, 1899-1900; No. 50, Charles-street, Berkeley-square, for Mr. Messop; alterations at the Canterbury Music-hall, Lambeth; and enlargement of the Athenaeum, in Godolphin-road, Shepherd's Bush, in 1899-1900; business premises and dwelling-houses at Kingston-on-Thames, King's-road, Chelsea, and in many other parts of London, and the environs; No. 15, Berkeley-street, W., for the Hotel Club, and Investment Company; rebuilding of No. 5, Stafford-street, Pimlico; and alterations of the upper portion of Willis's Restaurant, King-street, St. James's, for occupation by a club, 1902; a house in Gwendolen-avenue, Putney, one of his most recent works; and, in 1886, a mansion in Grosvenor-square. In July, 1886, Mr. Wimperis acted, in conjunction with Mr. D. Cubitt Nicholls, as professional adviser in an honorary capacity—in respect of the limited competition for the St. James's Dwellings, in Carnaby-market, Regent-street, W.

MR. STELFOX.—We have also to announce the death, in his forty-ninth year, of Mr. Henry Ernest Stelfox, of No. 6, Princess-street (formerly of Clarendon-chambers, Molesley-street), Manchester, and of Windsor-road, Levenshulme. Mr. Stelfox was Ashpitel prizeman, 1888, and was elected an Associate of the institute in that year, and subsequently

The Student's Column.

ASPHALT: ITS COMPOSITION AND PROPERTIES (concluded).

THE three kinds of pitch—all of the same origin—given in Table III. were investigated by E. Donath and M. Asriel, and a notable residue of organic matter was left insoluble. This, also, was examined, and the results are given below:—

TABLE IV.—RELATION OF ORIGINAL COMPOSITION TO RESIDUE.

	Carbon.	Hydrogen.	Nitrogen.	Sulphur.	Oxygen.	Ash.	Insoluble Residue per cent.	Asphalt in Petroleum Extract.
Coal-tar pitch soft	91.89	4.62	—	—	0.78	—	22.82	trace.
" " medium	94.32	3.98	0.148	0.77	to	—	38.06	—
" " hard	93.16	4.36	—	—	3.5	—	29.39	2.19
Black powder residue after the three extractions	89.2	2.3	0.7	—	7.13	0.67	—	—

In the large percentage and nature of the organic matter left from coal-tar pitch, there is thus possible a clear differentiation from refined Trinidad pitch or natural asphalt, but that factor is not sufficient as between the last-named and the petroleum pitches used for many artificial asphalts.

To find out more of the nature of the several bituminous combinations, Dr. Lunge and V. Krepelka (*vide Chemiker Zeitung*, 1904) tested nine different varieties of natural asphalt, four artificial asphalts prepared from petroleum

melting points recorded in the next table are those of the extracted bitumens in each case, and show that the quantity of extract must be supplemented by a knowledge of its properties. The melting point of the crude soft and hard pitches (coal-tar) were 97° and 235° F. respectively, whilst their extracts were 68° and 73° F. respectively.

The melting points were determined by Kraemer & Sarnow's method, to be herein-after described, and in each the mean of four tests is given.

The iodine value, determined by Hubl's method, is for the purpose of ascertaining the way in which the carbon compounds constituting the bitumens extracted are built up.

To show the relation of the melting points of the extracted bitumen, as given in Table V., to the bitumens as they occur in the gross, see table at foot of this page:—

Table V. shows that the natural rocks vary in their properties (as exemplified by the sub-groups), but within certain limits that are in accord with practical experience, and that

TABLE V.—TESTS OF EXTRACTED BITUMENS (LUNGE AND KREPELKA).

Class.	Origin and Description of Substance Tested.	Melting Point of Bitumen Extracted by Chloroform. Deg. Fahr.	Iodine Absorption.	Specific Gravity of Bitumen at 17° C. = 62° Fahr.
Natural Asphalts.	Limmer, near Hanover	60.8	23.37	0.9877
	Lobsann, in Alsace	77.0	23.84	1.0343
	Average of sub-group	68.9	23.60	1.0110
	Val de Travers, Swiss Canton of Neuchâtel	82.58	26.53	1.0529
	Tataros, Hungary	92.48	39.71	1.0931
	Beraudex, Venezuela	124.00	46.28	1.0861
	Seyssel, nr. Bellargue-on-the Rhone, France	127.6	44.33	1.0762
	Trinidad (not known what part)	131.36	54.10	1.0994
	Average of sub-group	111.6	42.19	1.0874
	Selenio	194.0	46.99	1.1131
Gilsonite, Utah, U.S.A.	253.4	46.08	1.1495	
Average of sub-group	223.7	46.85	1.1313	
Average of nine natural asphalts	127.04	39.09	1.0802	
Artificial Asphalts. Petroleum pitches.	Galleian	84.76	44.79	1.0985
	Unknown	100.04	44.26	1.1075
	Beaumont, in Texas	156.74	46.07	1.1741
	Wietze	244.76	52.02	1.1269
	Average of Petroleum Asphalts	141.68	47.01	1.1112
	Coal-tar pitch soft	68.0	69.34	1.2365
	" " " hard	73.4	64.39	1.2741
Average of Coal-tar Pitches	70.7	61.86	1.2553	

pitches, and a hard and soft coal-tar pitch, by treating them with commercially pure chloroform. The extractions dried at 120° C., were then examined for specific gravity, melting point, and for absorption of iodine. In addition, the specific gravity of a solution of given strength of the several bitumens in chloroform was tested, but found to be incapable of materially assisting the discrimination. The melting point of rock asphalt or of artificial asphalt is affected by the proportion of base to bitumen and other organic matter, but the

departure from these properties is greatest in the coal-tar pitches where with an almost equivalent melting point there is nearly a three-fold iodine value and a 25 per cent. increase in the specific gravity of the bitumen. With the petroleum pitch there is not much disparity in the iodine value or specific gravity of the bitumen, but more in the melting point. The difficulty of determining the amount of the adulteration of natural asphalt with petroleum pitch up to 20 or 25 per cent. is so great that Koracs declares it to be impossible, but its presence

Substance Tested.	Melting Point.	Percentage of Total Bitumens.	Percentage of Bitumen as Petroleum.	Authority.
Coal-tar pitch soft	97° F.	Not given.	Not given.	Dr. G. Lunge.
Coal-tar pitch hard	235° F.	Not given.	Not given.	Dr. G. Lunge.
Venezuelan pitch	150° F.	96.1	69.1	Laboratory, Imperial Institute.
Trinidad pitch or asphalt	192° F.	35.2	44.0	Laboratory, Imperial Institute.
		to	to	
		61.5	76.3	
Trinidad manjak	428° F.	95.25	12.6	Laboratory, Imperial Institute.
Barbados manjak	327° F.	Nearly 100.0	Probably over 20.	Laboratory, Imperial Institute.

Fellow. He served his articles in the offices of Messrs. Baker & Ellis. He was the architect of many private houses, commercial buildings, banking premises, parish halls, and similar buildings in Manchester and the country around, and during the last ten years or so, of several large schools. Amongst the last-named we may mention the schools in North Green-street, Broughton, to receive 590 infants and 500 girls on the two floors, with two assembly halls and a caretaker's house, at a cost of about 14,000*l.*; in Tootal-road, Weaste, with a central hall and seven classrooms for each of the three departments, and with provision for the teaching of cookery, laundry-work, and manual instruction, for 1,275 scholars, the designs being after the English Renaissance in character, and the total cost amounting to nearly 16,000*l.*; in West Peel-street, Regent-road; and in Devonshire-street, Higher Broughton, for about 800 scholars, for which his designs were selected in competition—all for the Salford School Board; the Board Schools in Ashton Old-road, for the Manchester School Board; the St. Peter's church schools, Swinton, to accommodate 1,000 children; and an equally large school for the Lovenshulme Urban District Council. In the earlier part of his career Mr. Stelfox held a lectureship of the Manchester Society of Architects, of which he was a Fellow. We understand that arrangements will be made whereunder the completion of the architectural works upon which he was engaged at the time of his death is to be entrusted to Messrs. C. K. & T. C. Mayor, of Manchester, architects.

Mr. W. C. Laws.—We regret to announce the death of Mr. W. G. Laws, who for many years was City Engineer and Surveyor for Newcastle, and had latterly been consulting engineer. Deceased was born, sixty-two years ago, at Tynemouth, his father being agent to the Duke of Northumberland. Mr. Laws served his apprenticeship with Messrs. Thompson & Boyd, engineers, Newcastle, and afterwards, having adopted the profession of civil engineer, he was much engaged upon the work of the North British and North Eastern Railway Companies. He designed, among other works, the bridge at Wylam. Mr. Laws was appointed Borough Engineer of Newcastle on December 7, 1881. He had been in private practice in Newcastle; but it was stipulated that, when appointed, he should devote his whole time to the duties of Borough Engineer. Mr. Laws retired from the more active duties of his office in November, 1901, when Mr. F. J. Edge was appointed to succeed him. Mr. Laws was then appointed consulting engineer. He was a past-president of the Association of Municipal and County Engineers, a member of the Institution of Civil Engineers, and a member of the Institution of Mechanical Engineers.

MEMORIAL BUST, WESTMINSTER.—A marble bust of the late Mr. William Ewart, M.P., was recently unveiled in the reading-room of the Westminster Public Library. It is the work of Mr. George J. Frampton, R.A.

SWEDISH TIMBER TRADE IN 1904.—In a memorandum dealing with the economic situation in Sweden, Mr. F. S. Clarke, Secretary of H.M. Legation at Stockholm, observes, *inter alia*, that a great change for the worse has this year taken place in the export of timber. The results of 1903 were good in the provinces, and prices in spite of a fall, ruled high. Sawm and planed wood was last year in great demand for South Africa—over 80,000 standards having been exported there, but the supply seems to have been greater than the demand (which was of a speculative nature), and the South African market, as regards such goods, has consequently been closed to Sweden during the whole of the present year. Prices in the United Kingdom (which usually buys 40 per cent. of the total) and in France for Swedish timber fell, as considerable insecurity prevailed in the export trade. This insecurity and the fall in prices has been increased by "obstinate resistance" on the part of many of the Swedish exporters, and by cheap sales at Archangel and at other Russian and Finnish ports. The price of planks fell some 25 to 50 per cent., while battens fell about 10 to 15 per cent. Scantlings and wood of smaller sizes fetched about the same prices as before. The decrease in comparison with last year in exportation up to the end of July last in planed and sawn wood was about 63,500 standards. Taking, as average values for wood of all kinds, the figures given by the Board of Trade in the Export Statistics for 1902, it is seen that the figures in the first six months of 1904 show a decrease of from eight to nine million kroners (400,000*l.* to 500,000*l.*)—a sum which may even be put higher if the fall of prices is taken into account.

qualitatively can be proved by chemical tests, which he sets forth in the *Chem. Rev. Fett und Harz Industrie*, vol. 7. He there gives particulars for preparing solutions of the bituminous extract, and all the substances he tested gave precipitates from these solutions, on the addition of absolute alcohol; that from the coal tar being brown, the bitumens black, sticky, and pitch-like, the petroleum pitch

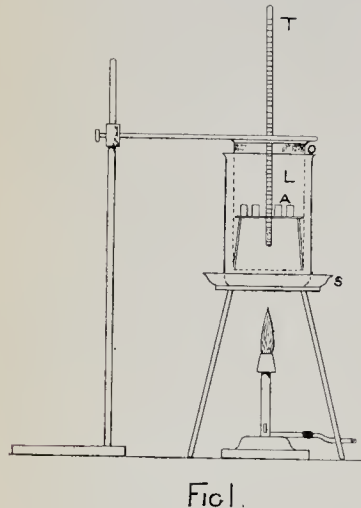


FIG. I.

and an unknown suspected substance, a fine, flocculent, black deposit. On drying these precipitates at 90 to 95° C., that from coal tar was pulverulent and light brown, from the bitumen black, sticky, and of high lustre, drawing out into fine threads when warm; whilst the other two were black, dull, earthy, and crumbled readily between the fingers. On agitating with absolute alcohol some of the original solution, the coal-tar pitch furnished a brown precipitate and a black, pitchy deposit; the petroleum pitch and the unknown sample, a black, muddy precipitate; and the natural bitumens, black precipitates or pitchy, cohesive deposits.

His conclusions are to the effect that the sticky cohesive properties of the ultimate constituents, as just described, account for the superiority of the natural asphalts for paving materials, as compared with petroleum pitch, which largely consists of earthy matters cemented by empyreumatic resins and oils, and soon loses its properties under the influence of sun and frost.

Continuing his researches, M. J. Kovacs has devised a plan of testing the viscosity or "dropping temperature" of asphalts, a description of which apparatus will be given later. He finds that asphalts for foot pavements must not "drop" under 176° Fahr., and for roadways not under 221° Fahr., and that it is useful to check the determinations by a standard bitumen kept for the purpose.

He advises that the term "asphalt" shall refer only to natural products, which occur either in the pure state or mixed with lime or sand, being, in the *pure state*, black and lustrous, and at the ordinary temperature tough and sticky or almost solid and brittle, with a dropping point not under 95° Fahr., easily and completely soluble in carbon bisulphide, turpentine, and chloroform, with difficulty soluble in petroleum spirit and benzene, and almost entirely insoluble in alcohol.

Specimens in their Normal Condition Tested for Viscosity by M. Kovacs.	Dropping Temperature In Degrees Fahrenheit.
Trinidad Asphalt	200.3
Dalmatian " (bituminous limestone)	206.6
Normal "	221.0
Tataros " (hard Hungarian bitumen)	237.2

These results may be compared with those in Table V. for the extracts, and those to be given later for artificial asphalts by Kraemer & Sarnow's method.

Recent investigations by Mr. Clifford Richardson have shown that an additional clue to petroleum pitch is to be found in the fact that "paraffin" is usually present, and that this can be detected and weighed by Holde's method, as modified by him. Natural asphalt he has found to be free from "paraffin," and the measure of the adulteration when mixed with a known percentage of a petroleum residue was found to be accurate. In this way a 20 per cent. admixture was detected with these particular substances. It must, however, be pointed out that all petroleum residues are not alike, and there is one great distinction between those of America and Russia, viz., that the former almost entirely consists of a series of bodies called "paraffins," whilst the latter consists almost entirely of a series of bodies called "naphthenes." Richardson has shown that there is evidence pointing to the presence of naphthenes in the Trinidad asphalt oils, in this respect as in others the deposits being similar to those of Baku in South Russia. In Europe there are petroleum residues of composition intermediate between the American and Russian, a fact that must be borne in mind in the interpretation of "paraffin" percentages in artificial asphalts.

FIG. II.

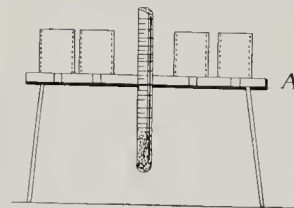
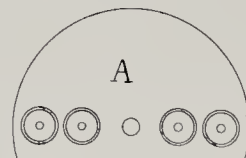


FIG. III.

The condition of the various classes of material in Trinidad, point to the fact that exposure to air and consequent oxidation have a considerable influence in their formation from the liquid gulped forth in a constant stream mixed with water, from which escapes sulphuretted hydrogen. The presence of sulphur in the asphalt appears to have an influence upon the properties, which, however, has not yet been clearly ascertained, but the facts just mentioned have led to patents being taken out in Europe and America for conversion of petroleum residues, from oil distillation works and others of a like nature, by blowing air through the mass, and in some cases adding a percentage of sulphur. Whether added sulphur can take the place of sulphur incorporated in a natural product during its genesis, remains to be proved, but it is well known that it has a marked effect when mixed with indiarubber, a substance akin to the bitumens. It is impossible to go into further details as to the effect of oxygen and sulphur, but the facts are mentioned to show what class of material is likely to be met with on the market, and to direct attention to the appropriate methods of discrimination.

The Effect of Liquid and Gaseous Hydrocarbons.

It has been found in Frankfort, in Brooklyn, and other cities where asphalt paving is used that the surface becomes disintegrated and softened if petroleum from passing vehicles or axle boxes of the same is allowed to drop upon it, and, further, that the heavy hydrocarbons of coal gas have a similar effect. The continued leakage of gas under an asphalt road-

way has been found to be injurious, and the affected portions of the substance when tested liberated gas. Passing similar gas into a tube containing sound asphalt speedily brought about the change, which ceased and was reconverted on exposure to air and absence of gas. Tests have shown that the constituents of the gas that were active were those that are absorbable by petroleum oils; an additional proof of the kinship of asphalts to petroleum.

Methods of Determining the Viscosity and the Effect of Heat upon Asphaltic Substances.

The effect of the "petroleum" is to facilitate the softening of the asphalt under the continued application of heat of a moderately high temperature, apparently causing a flux of those constituents that have a higher melting point. This is manifested in the creeping or buckling which is known to occur in hot weather with all except the best asphalts, and to determine this factor it is not sufficient to test the melting point as observed by raising the temperature over a short period of time only until liquefaction takes place, but to ascertain the viscosity by "dropping," or (what appears almost equivalent) the flux, by the effect of an ascertained temperature under a definite pressure. The first of these classes is that of M. Kovacs, whilst the second is that of Kraemer & Sarnow.

M. Kovacs' appliance is described at length in *Chem. Rev. Fett und Harz Industrie*, 1902, and is shown in the subjoined diagrams Figs. I., II., and III.

On a sand-bath *S*, about 6 in. diameter, with a ½-in. layer of sand is placed a beaker *O*, of 4 in. diameter and 6 in. high, containing sufficient rape-seed oil and glycerin to cover the beaker *L*, of 3½ in. diameter and 6 in. high, three-fourths of its height. In this air-bath the dropping frame (shown in Figs. II. and III. plan and vertical section) is placed. It consists of a brass disc, perforated in the centre for a thermometer, and with four perforations of

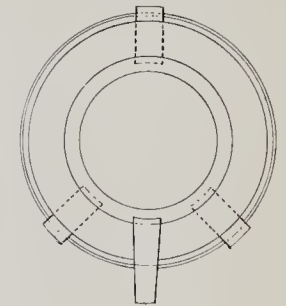


FIG. IV.

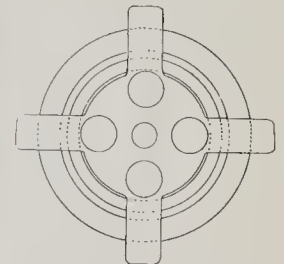


FIG. V.

2 mm. = .08 in. diameter, around which a brass cylinder of ½ in. internal diameter and 1½ in. high is soldered. The disc is supported by a tripod 2½ in. high. A regulated Bunsen burner is placed under the sand-bath, so that the temperature of the air-bath is evenly raised in each determination. The air-bath is covered

with a cork or glass plate. In testing hard-grade asphalt, 7.7 grains ($\frac{1}{2}$ grm.) is weighed out, formed into a pellet, and allowed to stand for from ten to twenty minutes. A pellet is then inserted in each of the small tubes of the dropping frame, this is immediately placed in the air-bath with a thermometer, and a thermometer is also suspended in the oil-bath. The gas burner is applied to the sand-bath, and after some time the softened asphalt is visible underneath the perforated disc, and as soon as it drops the temperature shown by the thermometer in the air-bath is noted. The following temperatures were observed in an experiment showing the rise per minute:—

At start	20° C.
After 5 minutes	22° C.
" 10 "	32° C.
" 15 "	48° C.
" 20 "	65° C.
" 25 "	81° C.
" 30 "	95° C.
" 35 "	106° C.
" 40 "	114° C. = 237° Fahr.

The apparatus devised by G. Kracner & C. Sarnow (*vide Chemische Industrie*, 1903) depends upon the flow of a definite head of mercury through a column of the bitumen substance and noting the temperature of this fluxing point, or melting point, as in Table No. V. It was brought out to overcome difficulties experienced with older methods in determining the softening point of coal-tar pitch, and has found general employment in the German tar industry.

The diagrams Nos. IV., V., VI. show the apparatus, which is quite easy to construct. Nos. V. and IV. are plans, whilst No. VI. is partly in elevation and partly in section. A quantity of about 25 grms. (386 grains) of the pitch under investigation is melted in a small beaker in an oil-bath (see Fig. VII.) at about 150° C., the pitch forming a layer about $\frac{1}{2}$ in. thick. Into this is dipped an open-ended tube made of glass, 4 in. long and $\frac{3}{4}$ in. internal diameter. On removing the tube the upper end is closed

by the finger, and the pitch is allowed to solidify in the tube whilst it is held horizontally and rotated. When the pitch has set, the portion adhering to the outside is removed, and the length of the column inside the tube will be about $\frac{1}{2}$ in. On the top of this is poured 5 grms. (77 grains) of mercury. The tube containing the pitch and mercury is then suspended in a beaker full of water resting in another beaker also full of water. The inner beaker also contains a thermometer, the bulb of which stands at the same level as the pitch. The outer beaker is heated by a Bunsen gas flame of small size. The temperature shown by the thermometer in the inner beaker is noticed immediately the mercury falls through the layer of pitch and is recorded as the softening, fluxing, or melting point of the latter.

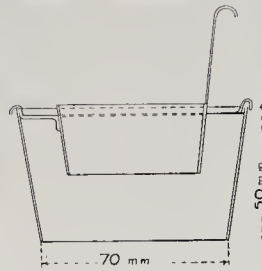


FIG VII.

As seen by the illustrations, several observations can be made at once. With substances which soften above 194° F., the outer beaker is filled with paraffin or paraffin oil and the inner with saturated brine or magnesium chloride solution. The thickness of the column of pitch does not within limits affect the result; a layer of pitch of 5, 6, and 7 mm. thickness having softened at 61.5°, 60.5°, and 61.5° C. respectively. The mercury is shown upon the pitch or asphalt being tested in the vertical section of the tube in Fig. VI. and is marked H_g.

Tests made by the apparatus gave the following results on pitches and asphalt of considerable variation in fluxing property: given in degrees Centigrade:—

Soft Pitch.	Medium Pitch.	Hard Pitch.
Average of four results on pitch from Gräbhus.		
51.375	58.55	80.325
Average of three results on pitch from Erkner.		
59.5	61.2	86.866
Refined Hard Asphalt.	Glass Hard Asphalt.	Petroleum Residue from Alsace.
52.0	82.0	103

GENERAL BUILDING NEWS.

ST. MARY'S CHURCH, NUNEATON.—The Abbey Church of St. Mary the Virgin, Nuneaton, has been long a ruin, a small and plain church having been built amid the ruins in 1876 for the use of the parish. Since 1876 the population of the parish has increased more than fourfold, and is now about 7,000, and in March last it was resolved to proceed with the restoration, keeping carefully to the original lines, and preserving all that remains of the ancient work. Mr. Harold Braispear was appointed architect. The complete scheme includes rebuilding the chancel, the north and south transepts, the central tower, and a further portion of the nave. This will give a total accommodation of 900 seats. The cost will be over 14,000*l.*, but only 800*l.* is as yet subscribed or promised.

PROPOSED CHURCH, HARROGATE.—Work has just been commenced at Harrogate on a new church, which is to be erected on a site in Duchy-road, at an approximate cost of 24,000*l.*, excluding the completion of the tower and spire. Mr. Temple Moore, architect, has prepared the designs for the building, and Mr. Thomas Rawling, builder, York, has secured the first contract.

NEW CHANCEL AND CHAPEL, EASTBOURNE.—The newly-erected north chapel and chancel of St. John's Church, Meads, Eastbourne, were recently consecrated by the Bishop of Chichester. The additions have been carried out from the designs of Mr. A. R. G. Fenning, Meads, and are in flint faced with Bath stone in conformity with the original structure, the interior being lined with yellow bricks ornamented with red Sussex bricks, and faced with Bath stone. The organ chamber has been altered to fit the organ, which has been entirely rebuilt.

COUNCIL SCHOOLS, LEEDS.—The new Brownhill Council Schools, which have been erected by the Leeds Education Committee, were opened on the 22nd inst. The schools occupy a site in Harehills-lane, the area of the land

being 8,655 sq. yds., and the total cost will come to about 21,210*l.* The buildings are in two blocks, the larger block facing to Harehills-lane, having been arranged for senior and junior mixed children. The larger block is two stories in height, and provides accommodation for 480 junior children on the ground floor, and 450 senior scholars on the first floor. The infants' school is a separate building, and is only one story high, accommodation being provided for 550 children. Three assembly halls are provided—one for each department—and classrooms are arranged round the halls. There are twenty-six classrooms in all. Two fireproof staircases are provided for the upper floor of the mixed department. One classroom is specially fitted up for cookery instruction. The buildings throughout are electrically lighted. There are also concreted playgrounds. The buildings have been designed under the direction of the architect, Mr. W. S. Braithwaite (Architect to the Education Committee), of Leeds.

A NEW MASONIC TEMPLE.—On Tuesday, St. John's Day, a Masonic temple, which has been erected at a cost of about 8,000*l.* in Cadzow-street, Hamilton, by the Kilwinning (No. 7) Lodge of Freemasons, was consecrated by Colonel P. Spence, Provincial Grand Substitute, Master of the Province of the Middle Ward. The lodge dates back to the XVIIth century, and its written records commence in the year 1752, when the Duke of Hamilton of the time was building Cathelherhault. A couple of years ago they disposed of their original quarters to the town for street improvements. The new temple is situated in a prominent position, and has, on the ground floor, two suites of offices. The lodge-room is on the upper floor, entered through a large doorway in Cadzow-street, the lodge-room proper being a spacious apartment with all the necessary adjuncts. Facing Lower Auchingramont-street is a hall for letting purposes, which provides accommodation for 400 persons, along with a house for the caretaker, cooking kitchen, etc. The design, which was chosen by competition, is in the old Scots style of architecture, and is by Mr. Alexander Collier, architect, Hamilton. In finishing the interior, special attention has been given to the colour decoration, and a free use has been made of stencil ornament. The entrance hall and staircase are painted in shades of purple and green, and the reception hall in white and lemon. The lower walls of the banquetting hall are of green, and the ceiling and frieze white, with stencil ornaments introduced at the frieze. The lodge-room has received special care. The vaulted roof is of a lemon colour, relieved by green and purple bands, and the intervening spaces decorated with Masonic emblems. Over the entrance are the signs of the Zodiac, while at the east end over the Master's chair is the rising sun. The furniture of the room has been designed by the architect. In the lodge-room are seven stained-glass windows, the three over the Master's chair having figure subjects, "Faith," "Hope," and "Charity," while the other four on the side walls show different degrees in Masonry. The preparation-room has three lights, representing "The Way," "The Truth," and "The Life," and the reception-room has four windows of an Eastern character. The rooms are lighted throughout with electric fittings.

MARKET HALL, SHEFFIELD.—The reconstruction of the front of the Norfolk Market Hall at Sheffield is now nearly completed. The frontage has a depth of 42 ft. The main entrance, which is 14 ft. 6 in. wide, is screened off from the Market Hall by folding doors. On either side of the principal entrance are lock-up shops, while on the first floor is to be a restaurant, and in the basement are to be shops with entrances from Exchange-street. The new frontage is of stone and brick, the pilasters and columns being of polished Labrador granite. The architects were Messrs. Holmes & Watson, of Sheffield.

HOSPITAL EXTENSION, BRADFORD.—A new out-patients' department is to be built as an extension to the Bradford Children's Hospital. The new department is to be erected at the east end of the hospital grounds, and detached from the main block, with frontages to Welbury-drive and Bertram-road. On the ground floor there will be a vestibule, a waiting-hall, capable of seating 150 to 200 persons, and an inner hall adjoining, having a registration-room, an operating-room, and a dispensary, all opening directly upon it. On the upper floor there is to be a house for the caretaker, who will act as lodgekeeper for the whole institution, and the basement will include a drug-bury and heating chamber. It is estimated that the cost, including fittings and adaptation of the rooms at present in use for

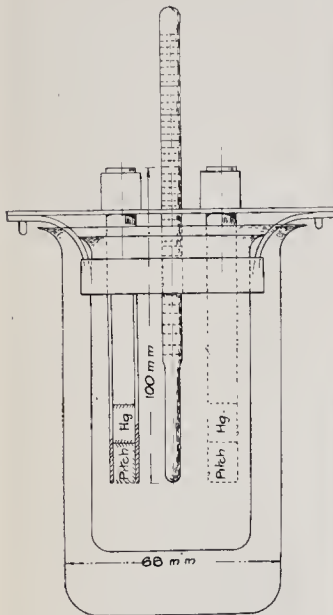


FIG VI.

by the finger, and the pitch is allowed to solidify in the tube whilst it is held horizontally and rotated. When the pitch has set, the portion adhering to the outside is removed, and the length of the column inside the tube will be about $\frac{1}{2}$ in. On the top of this is poured 5 grms. (77 grains) of mercury. The

out-patients, will amount to 1,700. The building is to be constructed from plans which have been prepared by Mr. James Ledingham. The following are the contractors:—Excavators, masons' and bricklayers' work, Charles Booth & Son; carpenters' and joiners' work, Greenwood Brothers; plumbers' and glaziers' work, Gabriel Jackson; slaters' work, George Wilkinson; plasterers' work, Thomas Bolton; painters' work, James Lynn.

LIBRARY, WHITECHURCH, CARDIFF.—The new free library, built at Whitechurch by means of a grant of 2,000*l.* from Mr. Carnegie, was opened recently. The following are the dimensions of the building:—Ground floor—reading-room, 63 ft. by 27 ft.; lending department, 21 ft. by 16 ft.; librarian's room, 11 ft. 3 in. by 11 ft. 3 in. First floor—kitchen, and two bedrooms for caretaker. There are two entrances, one being reserved for ladies. The reading-room has been provided with a folding partition. There are fifteen newspaper stands and tables for magazines, with seating accommodation for sixty-four readers. The bookcases in the lending department will store about 6,000 volumes. The premises are heated by hot-water pipes. The elevation has been faced with Cattybrook red bricks, dressed with Bath stone. Messrs. R. & S. Williams, Cardiff, were the architects, and Mr. W. T. Morgan was the contractor.

CHELMSFORD FREE LIBRARY.—The foundation-stone of the public buildings at Chelmsford, which will comprise a free library and reading-room, science and art school, and museum, was laid recently by Lord Rayleigh. Messrs. F. Chancellor & Son, of Chelmsford, and London, are the architects. The buildings comprise a ground and first and second floors. In the centre on the ground floor there will be an entrance hall, with main staircase, men's common-room, women's common-room, librarian's room, and office, with lavatory accommodation at the back. In the north wing on the ground floor there will be a museum, library, and large museum, and in the south wing the lending library and reading-room. The first floor will include a classroom for design, master's room, and casting-room, with store-rooms. In the north wing on the same floor there will be a life-room, a room for elementary art and mechanical drawing, and in the south wing a room for applied art, and this last will have a north light window. The apartments for the curator will be on the second floor. The buildings will be heated throughout with hot water, and lighted by electricity. The frontage to the Market-road is 82 ft. The exterior of the building will be faced with red brick, and stone dressings. The builders are Messrs. H. Potter & Son, of Chelmsford, and the clerk of the works is Mr. James Bugg.

LIBRARY, PLUMSTEAD.—A public library has just been opened by the Right Hon. John Morley, M.P., on the south side of High-street, Plumstead. The building has been erected from designs prepared by Mr. Frank Sumner, the Borough Surveyor and Engineer, by Messrs. Henry Lovatt & Co., of Wolverhampton, at a cost of about 14,000*l.* The building has a frontage of 60 ft., and a depth of 151 ft., and is entered from High-street by a vestibule leading to a corridor. On the right is the newsroom, 56 ft. by 24 ft., furnished with stands for fifty-six newspapers, and two tables to accommodate fourteen readers. On the left is the magazine room, 29 ft. by 24 ft., with tables to accommodate forty-two readers. At the rear of the newsroom is the lending library, which, with the borrowers' space, covers an area of 62 ft. by 32 ft., and has at present accommodation for 20,000 volumes. The total length of the lending counters is 59 ft. The ladies' room, with accommodation for twenty-eight readers, and the librarian's room are entered from the borrowers' space. The juvenile library, 34 ft. by 21 ft., has a separate entrance and vestibule from the private road on the east side of the building. It has sitting accommodation for forty-eight readers, and also contains the lending counter for the juvenile department. The portion of the building does not communicate, except privately, with other parts of the library. The first floor of the public portion of the building is approached from the end of the corridor by a stone staircase, and comprises a reference library, 65 ft. by 24 ft., and spare-room, 65 ft. by 30 ft. The reference library is lighted by three large ceiling lights, and has accommodation for 6,500 volumes. The spare-room has an elliptical ceiling, and has been designed with an object of being used as a museum, or for library lectures. In the basement are repairing and store rooms, with shelving available for 5,000 volumes. Lift communication with the lending and reference libraries is also provided. The residence for the librarian is situate on the first floor. The building is electrically lighted, this portion of the work

being done by the Borough Electrical Engineer (Mr. J. B. Mitchell). The floors are fireproof. The elevation of the building in the High-street is faced with Farnham red bricks, having Portland stone dressings, while the east elevation is faced with Istock red bricks, and similar dressings.

TOWNS HALL, MOUNTAIN ASH.—Lord Aberdare opened a new town hall at Mountain Ash recently. The building stands on the site of the old Workmen's Hall. On the ground floor are offices for the surveyor, sanitary inspector, overseers, and rate collectors, with a hall and staircase leading to the first floor. On the first floor is a council chamber and room for the town clerk and education department. On the top floor are several rooms for the use of the caretaker. The principal floors are fireproof, covered with wood blocks. Those used for the council chamber are of oak. The corridors and halls are laid in mosaic work, and the principal staircase is granolithic. These, together with the wood blocks, have been executed by Messrs. B. Ward & Co., Cardiff, and the blocks by Messrs. J. Smith & Sons, Derby. The contractors were Messrs. E. R. Evans & Brothers, Cardiff. The amount of the contract was 4,300*l.* The architect for the building was Mr. John H. Phillips, Cardiff.

STAINED GLASS AND DECORATION.

LEVEN, FIFE.—A three-light east window has just been fixed at this church by Messrs. Percy Bacon & Brothers, of London. The centre light contains three figures, the top depicting Our Lord in Majesty, with Moses and Elias in the two spaces under, while on each side in the outer lights are St. Peter and St. Paul; under the two latter are angels bearing scrolls with texts.

SANITARY AND ENGINEERING NEWS.

LIVERPOOL WATER SUPPLY.—The report for 1903 of the City Water Engineer (Mr. Joseph Parry) contains information as to the supply of water to Liverpool, Wallasey, etc., the quality of the water, the source of supply at Vyrwy and Rivington, the outlay and income connected with the undertakings, etc. The year in question, according to observations made on Rivington watershed, was one of the wettest on record, there having been only three years which exceeded it in the past half century. The total volume of water delivered from the Corporation works during 1903, including statutory compensation waters to rivers in Lancashire and Montgomeryshire, was 17,515,037,000 gallons. The additional number of new houses and other new premises supplied with water in the Liverpool district during the year was 4,111, the net number, after withdrawals, etc., being 3,224. The total number of tenants on the rent-roll of the water account at the end of the year was 187,751. As to the quality of the water, Professor Boyce reported that purity was well maintained during the year. The capital expenditure on the Liverpool waterworks for the year was 5,517,099*l.* 12s. 9d., and the gross revenue on ordinary account, including Chorley, 519,395*l.* 1s. 11d. The new reservoir at Prescott, which was practically completed before the end of 1903, is described with the aid of photogravure views, illustrative of the screening-chamber and automatic valve at the outlet, and of the overflow and washout.

DRAINAGE PLANS.—In addition to those already reported in the *Builder*, the following Borough Councils have considered the letter from the London County Council submitting for an expression of opinion a proposal by the Royal Institute of British Architects for the amendment of the by-laws relating to the details insisted upon in plans of drainage work required to be deposited:—Bermondsey. While agreeing in the main with the Institute's proposal, the Council is of opinion that the power of requiring the detail plans under the by-laws should be retained, but that this power should only be exercised when the local authority considers it necessary. Poplar.—The Council holds that plans in accordance with the by-laws are necessary, and that the suggested amendment should be opposed. Southwark.—Acting upon a report of the Borough Surveyor, the Council are strongly opposed to any alteration being made in the existing by-laws. Shoreditch.—The Council has adopted a report from the Borough Surveyor to the effect that the by-laws referred to have assisted the Works Committee in the past in dealing with plans for drainage work, and that it is in the interest of the public generally that the fullest information should be set out before such plans are approved.

SEWERAGE WORKS, BENWELL.—The sewerage scheme, initiated by the Benwell and

Fenham Urban District Council, was formally opened on the 20th inst. The main sewer is three and a half miles long, and cost close on 20,000*l.* The contractors for the work were Messrs. E. & A. Storey, the engineer being Mr. Harry W. Taylor.

FOOTBRIDGE, COPLEY.—An iron footbridge, erected by the Halifax Corporation over the river Calder, at a cost—inclusive of land for the necessary approaches—of 800*l.*, was opened on the 17th inst. Messrs. Graham, Morton, & Co. supplied the ironwork, and the stonework was carried out by Messrs. Bower Brothers. The plans for the structure were drawn by Mr. J. Lord, the Borough Engineer.

FOREIGN.

FRANCE.—A monument to Gavarni was inaugurated a few days since. M. Henri Guillaume, the architect for the work, has utilised the basin of the old St. Georges Fountain, in the centre of which he has placed an octagonal granite pedestal which forms the base to a column carrying a marble bust of Gavarni. Humorous figures—his principal works are sculptured in bas-relief on the column, and bronze masks, disposed about the rim of the basin, pour water into it. The sculptural part of the work is by M. Denys Puech.—An exhibition of the works of M. Bartholomé, the sculptor of the "Monument aux Morts," has been opened at the Galerie d'Orléans, Rue Royale.—An "Exposition Internationale de peinture et Sculpture" has been opened at the Georges Petit Gallery, and will remain open to the end of the month. Among the exhibitors are MM. Carrier-Belleuse, Harnisson, Legorst-Gérard, Rochegrosse, A. Smith, Bernstanun, Puech, and Théodore Rivière.—A competition has been opened at Nancy for the erection of a Hotel for the offices of the Chamber of Commerce. A French committee has been formed to raise a monument to Sainte-Buve at Lausanne. It is to be carried out by a Swiss sculptor, M. Lugeon.—A competition is to be opened for the construction of a boulevard along the line of the shore at Hyères.—M. Albert Balu has recently discovered, in the course of his excavations at Timgad, some interesting remains of a Roman building which is supposed to have been a public library.—The municipality of Nancy have opened a competition for the laying out of a public park, with gateways and an iron grille, in the new quarter called Mont Desert.—A sum of a million francs has also been voted for the improvement of the market at Nancy.—M. Tournaire has been commissioned as architect for the enlargement of the Palais de Justice at Paris. The new buildings will include a tower at the angle of the Boulevard de Palais and the Quai d'Orléans, but lower and more massive than that at the opposite corner of the Boulevard.—M. Nestor Alans, member of the Société Centrale des Architectes, has died, at the age of seventy-five, at Montpellier. He was a pupil of Lebas and of Lazard, and contributed largely to the various improvements at Montpellier, especially those in the neighbourhood of Halle Castellane.—The death is announced, at the age of eighty-three, of the painter Giacomelli, celebrated for his illustrations of birds. He was the artist for almost all the standard works on birds, such as Mibellet's "L'Oiseau," André Theuriot's "Nos Oiseaux," etc. His last work was the illustration of the "Merle Blanc" of Alfred de Musset.—The death is announced also of M. Denys Darcy, architect to the cathedral of Saint Denis and to the diocesan buildings of Rheims and Evreux. He received a medal in the Salon of 1869, and gold medals in the Universal Exhibitions of 1873 and 1889.—M. Carolus Duran has been appointed Director of the Villa Medici. M. Duran was born at Lille in 1837; he was a pupil of Souchen, and received medals in the Salons of 1866, 1869, and 1870. He went through all the grades of the Legion of Honour, being named "Grand Officier" in 1900. He obtained the Medal of Honour in the Salon of 1879, and in the present year was elected a member of the Institut. The new appointment compels M. Carolus Duran to resign his position as President of the Société Nationale des Beaux-Arts (New Salon), but he has been specially requested to remain in office till the next Salon. When his resignation actually takes place, he will be succeeded by one of the four Vice-Presidents, MM. Roll, Bessard, Rodin, and Walther.—The Académie des Beaux-Arts has elected M. Knause, a German painter, Honorary and Corresponding member in the section of Painting.—M. Turin, architect, of Paris, has obtained the first prize in the competition for designs for

*The notes up to this point were postponed, for want of space, from a previous issue.

street booths (*barraques*) organised by the conductors of the *Exposition*.—A new bridge is to be built over the Marne, between Champigny and Saint-Maur-des-Fossés.—A large casino is to be built at Nantes, to include a hotel, baths, theatre, and circus.—The "Société des Architectes de Seine-et-Oise" has elected M. Albert Petit, of Versailles, as President for 1905.—MM. Jasson, Gutin, and Lautner have been commissioned architects for a proposed municipal theatre at Nancy, to be erected at a cost of two million francs.—The ancient church of Villy-sur-Avois (Côte d'or) has been classed among "Monuments Historiques."—It is proposed to build among the pine-forests of Arvachon, a "Lycée Climatique," conducted according to the most recent principles of hygiene.—The Conseil-Général of the Seine has opened a competition, for French painters, for the decoration of the new theatre of Fresnes; and M. Eugène has been chosen, by the same body, to carry out the decoration of the theatre of Romainville.—A decorative picture by M. François Flameng, symbolising Music, has just been fixed in position in the Hôtel de Ville at Paris.—M. Nénot has been re-elected President of the Société Centrale des Architectes for 1905.—The Académie des Beaux-Arts has elected Mr. Stanhope Forbes an Honorary and Corresponding member, in place of the late Mr. Watts.—There is talk of erecting at Paris an "Opéra Populaire" on a portion of the grounds of the old *Marché du Temple*. The auditorium will be planned in a fan shape, and capable of seating 4,000 persons. The building is to be entirely isolated, and carried out in incombustible materials, at an estimated cost of four million francs.—The Municipal Council of Paris has passed a vote to the effect that the old Hôtel de Rohan, which is of great artistic value, ought to be taken over and preserved by the State, after the removal of the *Imprimerie Nationale* by which it is at present occupied.—A new railway line is shortly to be opened between Paris, Bourges, and Montluçon, by way of Bourges, Pithiviers, Beaune-Roland, and Argent.—The jury in the competition for a new church at Coulommiers has awarded the first prize to M. Bruner, who will carry out the building.—The death is announced, at the age of sixty-seven, of the architect Arthur Froelicher, who carried out a number of private residences, more especially the châteaux of Mugue and of Roucellerie (Loiret), that of Rosendal at Dieppe, and numerous private hotels at Paris.—M. Detille has been elected President of the Académie des Beaux-Arts, in place of the late M. Pascal. M. Jacquet, the engraver, is Vice-President.—The Académie has given, as the subject of the next Achille Leclercq prize, "The Construction of a Belfry." The work has been commenced for restoring and improving the Place du Belfroy.—The large central balcony is to be replaced by a square in the centre of which is to be raised a statue of Beethoven, by M. Charnoy.—The death has been announced of M. Henri Schmit, architect of the Casino at Monte Carlo; also of M. Bouhon, Vice-President of the Société Nationale des Architectes.

GERMANY.—The new hospital at Munich, built by the architect Heilmann and Littmann under the direction of Herr Stempel, was opened on November 8.—The new theatre at Stuttgart is not to be erected on the site of the old one, which was burned down; three sites are now under consideration. The building is to cost about 5,500,000 francs.—The manager of the theatre at Dessau has made a repertoire of curtain which is said to combine the advantages of asbestos and iron, having the disadvantages of neither; the curtain is absolutely fireproof, having withstood a heat test of 1,500 deg.; old curtains can, it is stated, be remade in this manner.—A competition for designs for a town hall at Wilmersdorf, near Berlin, is to be held in April, 1905. The first premium offered is 8,000 marks, the second 5,000 marks, and there will be two third premiums of 3,000 marks each.—The synagogue at Düsseldorf, built from designs by Professor Josef Kleesattel, is completed; the building is intended to accommodate 1,300 people.—A new art gallery, called the "Heinemann" Gallery, has been built in Munich, after designs by Professor E. Seidl.—The Memorial Church at Speyer, designed by the architects Flügge and Nordmann, is completed; the building cost nearly two million marks.—The architects Reimer and Korte, are occupied with the designing of a building in Berlin for the Society of German Engineers.—The Commercial Schools at Cologne are to be built after plans by the architect Herr E. Vetterlein, and will cost 5,100,000 francs.—The Church of St. Stephen in Berlin, which was consecrated on December 4, is built in Early Gothic style from designs by the architect, Herr

Birckner.—A new hotel in "Pariser-Platz," Berlin, is being built from plans by Herr Gause; the building is to be in Italian Renaissance style.—The Town Council of Munich has offered premiums amounting to 12,000 marks for designs for exhibition buildings and grounds; the competition is to be open to all architects resident in Bavaria.—The new Law Courts at Hamburg are being built from plans by Messrs. Landt & Kallmorgen.—The two new Catholic churches at Löwen have been built from plans by Herr Ludwig Schneider.

AUSTRIA.—The architect Herr Karl Dübüll, director of the firm C. Bamberger, died at Vienna on November 15 in his fifty-ninth year.—The "Leo" Society will hold an exhibition of sacred art in the beginning of December in the Vienna Art Gallery.—The Austrian Museum at Vienna is being enlarged under the direction of Herr Baumann; the new buildings will consist chiefly of exhibition galleries, so that the older portions may be devoted to permanent collections.—Herr Arnold Heymann is the architect for a new theatre for Vienna, to be called the "Landstrasse" theatre.—A new theatre is to be built at Mahr to hold 800 people, at a cost of 400,000 kron.—The sculptor, Professor Edmund Hellmer, is executing a fountain in Hungarian marbles for the Vienna University; the artist has taken his idea from the legend of Castalia.—Herr Otto Kuhlmann has gained the first premium in the competition for designs for a Lutheran church at Chemnitz.

SWITZERLAND.—Herr Julius Stadler, the architect, died at Zurich on November 27, in his seventy-sixth year.—A Chemical Institute in connexion with the University is to be erected at Zurich, also new schools.—New technical schools are also to be built at Winterthur.—A new Almshouse is to be built at Einsiedeln, at a cost of 140,000 francs.

M. Edouard Guinand, is designing a series of workmen's cottages and gardens at Lausanne; each cottage is to be on a different plan.—In the competition for plans for schools at Vausson, near Neuchâtel, the following premiums have been awarded:—First premium (800 francs), MM. Prince & Béguin, of Neuchâtel; second premium (500 francs), Herr Ubaldo Grassi, of Châtel; third premium (300 francs), Herr Werner Lehmann, of Berne.

DRAINAGE OF SANTIAGO.—A despatch from Mr. Lowther, C.B., H.M. Minister at Santiago, states that, in reply to an advertisement published in May last, only two tenders were submitted for the proposed drainage works at Santiago. One was by a Chilean contractor for the sum of 1,186,400, and the other by a local firm, acting as agents for a French firm, for the sum of 1,350,000. Mr. Lowther adds that both tenders have been referred to a commission for examination, but it is generally believed that fresh proposals will be asked for under modified conditions.

CEMENT IN ITALY.—Mr. Consul-General Chapman reports to the British Foreign Office from Florence, Italy:—"No British cement is now imported here; Italian cement is commonly used. The best quality cements are obtained in this district at Fabriano, Chiarvalle, Senigallia, etc."

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Rottmann & Co., wall-paper manufacturers, of Garlick-hill, Victoria-street, have opened new West-end showrooms at 29, Mortimer-street, W.—Mr. Arthur R. Mayston, architect, has removed his offices from No. 7 to No. 11, Great James-street, Bedford-row, W.C.—Messrs. A. Ransome & Co., manufacturers of wood-working and saw-mill machinery, will remove their London offices on January 2 from their present address at Chelsea to 65, Queen Victoria-street, E.C.

SAVOY HOTEL, STRAND.—The associations of the site of the hotel with the earlier history of the palace and precincts of the Savoy are commemorated by a statue, designed and executed in gilded bronze by Mr. Lynn Jenkins, which has just been erected on the bridge at the entrance into the courtyard of the Strand. The figure, which is of the heroic size, clad in mail, with shield and lance, represents Peter, the uncle of Henry III.'s consort, Eleanor, whom the king created Earl of Richmond and Savoy, giving him the land by the riverside whereon the Earl built himself a palace in 1245. Peter gave his property there to the Prior and Brethren of Mountjoy (de Monte Jovis), near Havering-at-Bowen, in Essex. The property was sold to Queen Eleanor, who bestowed it upon her son, Edmund Crouchback, Earl of Lancaster, in 1284. The manor passed to Blanche, daughter and co-heir of

Henry, Duke of Lancaster, who married John of Gaunt, and was then vested, as the Duchy of Lancaster, in the King and his successors on the throne. We observe that considerable pains have been taken to record, with inscribed bronze tablets affixed to various portions of the new structure, the positions of the older buildings which possess but no little interest from the historical and topographical points of view. That example might well be followed in similar cases; the tablets, besides being of value to the present generation, would often be the means of preventing perplexity and controversy hereafter.

BRITISH FIRE PREVENTION COMMITTEE.—No. 39 of the publications of the British Fire Prevention Committee contains nine tests of a lamp, for safety if overturned. The lamp is called the "Petrolite lamp" and is an apparatus in which the air is automatically and continuously carburetted by being made to pass in a downward direction through a receptacle charged with absorbent non-combustible material, saturated with light hydrocarbon (petroleum spirit), such receptacle being immediately below the burner, and the carburetted air being raised through a tube direct to the burner from the absorbent material by the heat of combustion in the chimney or funnel. The draught is started by applying a lighted match through an opening at the bottom of the chimney, or by inserting a lighted taper downwards in the chimney from the top, and the carburetted air thus drawn up will immediately ignite. The regulation of the lamp is carried out by the simple arrangement of turning one lever only, which simultaneously controls the air inlet to the carburettor, the carburetted air exists from the carburettor to the burner tube, and the air supply to the latter. The tests made, which, of course, were of a different character from those usually made on the Committee's premises, appear to have had very satisfactory results. The lamp was overturned several times in two of the tests, falling on the floor among shavings and other easily combustible materials, but in each case went out without igniting anything.

SURREY VAPORVILLE THEATRE, BLACKFRIARS-ROAD.—Several improvements have been carried out, at a cost of about 6,000, for the owner, Mr. de la Pole Temple-West, by Messrs. Kirk & Kirk, of Westminster. Mr. Temple-West has converted the old Surrey Theatre into a music-hall; all the pit floor has been relaid, two new stage boxes have been built, the stage is relaid with pitch-pine, and the grand circle tier is fitted with tip-up seats. The decoration scheme is in gold, cream, and light pink; electric light and hot-water radiators are installed. As the venture is of a somewhat novel kind, we may mention that the prices of admission range from 2d. in the gallery, which is one of the best in London, to 2s. for a chair in the private box. The theatre has belonged to the West family during more than a hundred years past, having been first built in 1782, as "The Royal Circus and Equestrian Philharmonic Academy," for Charles Dibdin and Charles Hughes, the circus-rider, in rivalry of Astley's Royal Amphitheatre in Lambeth. After a fire on August 11, 1805, the Royal Circus was rebuilt, from plans and designs by Cabanel the younger, as the Surrey Theatre, and the house has suffered greatly from fire on two occasions since.

AUSTRALIAN FORESTRY.—The importance of forest conservation is beginning to receive increased attention in the Commonwealth, where the revenue from the various State forest lands remains considerably below that obtained in countries possessing far less forests, contrary to the popular idea in Europe and America, extend over almost the whole area of the State, excepting portions of the Monaro, Lachlan, Murrumbidgee districts, and the trans-Darling region, where extensive treeless plains occur, clothed with salt-bush, scrub, or species of natural grasses. There are at the present time nearly six and a half million acres of forest reserves in the State. In South Australia there are nearly 200,000 acres of forest reserves and plantations; in Queensland, where forest conservation is of recent date, the reserved areas form a total of over 3,000,000 acres; in Victoria the forest reserves cover a total area of 4,679,540 acres out of 11,797,000 acres of forest country, the balance being mostly timber country difficult of access; in Western Australia a beginning has been made by establishing forest reserves, forming a total of over a million acres out of an estimated total of 20,000,000 acres; while in Tasmania about 53,300 acres have been reserved for timber planting and growing. The total area of forest land in the latter State is about 4,000,000 acres, and it has been estimated that

the forest lands of the Commonwealth cover an area of over 50,000,000 acres. The trees met with are chiefly species of eucalyptus, Myrtaceae. The prevalence of the eucalypti, and the large extent covered by the forests, give the country a rather monotonous aspect; but the park-like appearance of the open forests, and the beauty of the many flowering shrubs, win admiration in spite of the sameness of the trees; while even the dull, greyish blue of the foliage of the gum trees, when relieved by the yellow blossoms of the wattle, including the graceful myall, or the beautiful and shapely kurrajong, is not without its attractiveness.

MALDEN BATH IMPROVEMENT BILL.—The Urban District Council of Malden Bath are promoting in the next session of Parliament a Bill dealing with a large number of matters relating to the improvement of the town. Amongst other matters they ask for powers to acquire lands and erect a pump-room for utilising the thermal waters of the Grotto spring, known as the Royal Well, and in connexion therewith to erect baths, pavilions, conservatories, waiting, refreshment, and reading rooms, and museum. They also seek to enlarge the recreation grounds, and improve the existing walks along the bank of the river Derwent, and to erect pavilions for concerts, etc., in the recreation grounds. The Bill also gives the District Council further powers with respect to the regulation of buildings, sewers, and sanitary matters.

LONDON SQUARES AND ENCLOSURES (PRESERVATION) BILL.—The London County Council have now deposited their printed Bill in the Private Bill Office of the House of Commons for the purpose of prohibiting the erection of buildings and structures on squares and enclosures, which in the preamble they state are necessary for recreation and the air spaces afforded by the lands are of great benefit to the health and well being of the inhabitants of the county. The Bill exempts all the scheduled land from assessment and rating on the basis of site value, and provides for the Council and the owners of such lands entering into agreements for their maintenance. Altogether 451 such spaces are scheduled, including the following well-known spots:—Clifford's in-gardens, Temple-gardens, Belgrave-square, Berkeley-square, Dean's-yard, Eaton-square, Eccleston-square, Grosvenor-square, Hanover-square, Whitehall-gardens, St. James'-square, Knightsbridge-green, Soho-square, Vincent-square, Prince's-garden, Belgrave-street, New Court, Cadogan-place, Cadogan-square, Carlyle-square, Han's-place, Cheyne-gardens, Burton-court, Sloane-square, Finsbury-square, Charterhouse-square, Bedford-square, Bloomsbury-square, Russell-square, Queen's-square, Gray's-inn Gardens, Lincoln's-inn-fields, Islington-green, Cromwell-gardens, Onslow-crescent, The Boltons, Harrington-gardens, Hyde Park-gate, Sussex-gardens, Westbourne-terrace, Lancaster-gate, Hyde Park-square, Paddington-green, Portman-square, etc.

ST. PAUL'S CHAPEL, GREAT PORTLAND STREET.—A Bill has been deposited in the Private Bill Office of the House of Commons which provides for the demolition of St. Paul's Chapel, Great Portland-street, which was built under an Act of Parliament, passed in the first year of the reign of William IV. The site is to be sold, and the stained-glass windows, organ, bells, tablets, monuments, and all other ornamental fittings and furniture disposed of by the Ecclesiastical Commissioners as they, with the consent of the Bishop of London, may determine.

ARCHITECTURAL WORK OF MUNICIPAL AUTHORITIES.—The Borough Councils of Paddington, Brompton, and Stoke Newington have decided to take no action in respect to a memorial from the Royal Institute of British Architects urging upon local governing authorities that architectural work be not placed in the hands of engineers and surveyors, and that, where the employment of a county or municipal official is deemed necessary, such official shall be required to have passed the qualifying examinations of the Royal Institute of British Architects.

TECHNICAL INSTRUCTION IN MALTA.—In his annual report on the affairs of Malta the Lieut.-Governor states that a technical and manual school, in which drawing, modelling in clay, plaster-casting, stucco-work, and wood-carving are taught, has been in existence for some years. The attendance is voluntary, and no fees are paid, and as the results obtained hardly justify the expenditure involved it has been decided to close the school as soon as some work which it has undertaken for a private individual is completed, and to develop the technical education which is given in the elementary schools.

CANTERBURY CATHEDRAL.—On December 18 the Archbishop of Canterbury unveiled the west window which has been set up in the

Chapter House in memory of the late Dean Farrar, who, as Dean in 1895-1903, raised a sum of nearly 20,000*l.* for the reparation of the cathedral. The window, which illustrates events in the lives of past benefactors of the church, from the days of Augustine and Queen Bertha, was designed and executed by Mr. A. O. Hemming, of London, who was also the artist of the east window, presented by the Freemasons of Kent; and carried out the scheme for redecoration of the Chapter House.

BUILDING BY-LAWS.—At Lewes Petty Sessions, on Tuesday, at the conclusion of the ordinary business, Mr. W. W. Grantham made an application in connexion with the finding of the magistrates in the proceedings instituted by the Chichester Rural District Council against Mr. Justice Grantham for an alleged infringement of their building by-laws. Mr. Grantham, on behalf of Sir William Grantham, said he was instructed to apply to the Court for a copy of all the depositions, by-laws, and plans that were produced either in Court or before the magistrates during their deliberations, or for an inspection of the same. An inspection might simplify matters and save the expense of copies. The defendant had instructed him to say, in reference to the findings of the Bench, that he proposed to apply to the Court of King's Bench for a *certiorari* to send up all the proceedings to the High Court to be quashed on many grounds, and, if necessary, the defendant would apply for a *mandamus* to be presented to the magistrates of the Lewes Bench to dismiss the informations on the findings of the Bench. Mr. Patrick, the Clerk to the Chichester Council, said the plans, by-laws, and correspondence had already been furnished in full to the defendant's representatives, and the magistrates' clerk's notes only remained. That could be very well left to the Bench. The District Council raised no objection, it being part of their policy to let the defendant's representatives have every possible information. The magistrates and their clerk consulted in private, after which Mr. Kemp said they felt unable to grant the application.

NEWCASTLE, ETC., BUILDING TRADE EMPLOYERS' ASSOCIATION.—The annual dinner of the Newcastle, Gateshead, and Tyne District of the Building Trade Employers' Association was held on the 20th inst. at the County Hotel, Newcastle. The chair was occupied by the President (Mr. W. T. Weir, of Howden). After the loyal toasts, Mr. S. Easton gave "The Mayors and Corporations of Newcastle, Gateshead, and Tyneside." Mr. Edge, City Engineer, responded on behalf of the Newcastle Corporation, and the Mayor of Gateshead also responded. Mr. T. Wilkinson, President of the Northern Counties' Federation of Building Trade Employers, proposed "The Newcastle, Gateshead, and Tyne District Branch of the Northern Counties' Federation of Building Trade Employers." He said Newcastle was one of the most important parts of their Federation, and they looked to that district for light and leading in connexion with all matters in the building trade. They had been organising the building trade in connexion with this Federation movement for six or seven years, and they had had a large measure of success, to which the Newcastle district had largely contributed. Not only did they deal with questions affecting the workmen, but they had come to a better understanding with the architects and surveyors under whom they worked. Ordinary people could not perhaps understand that the builders' business was not directly done with the clients themselves, but through a third party. So he was glad to say that their Federation had managed to bring about an agreement which would protect the rights of the builders, the architect, and the clients. The Chairman (Mr. W. T. Weir) responded. He said in Newcastle they had an association that made itself felt in their midst, and was unanimous in action. During the year their work had largely been of a routine character, but it had been none the less valuable. One of the things they had been aiming at was to ensure that their apprentice bricklayers should learn in classes the practical manner of laying bricks. That object, he hoped, would be attained before another winter had passed. Another thing they hoped to see established was an association of foremen and clerks of works. Most of the foremen were in the men's associations, and he was certain that once they formed an association of their own, it would tend largely to assist architects and engineers in the carrying out of their designs. He went on to refer to the valuable evidence which had been given by representatives of the National Federation on the Royal Commission on trade picketing, which, he hoped, would tend to good all round. Mr. D. R. Brims gave "The Architects and Surveyors."

Mr. Frank Caws responded on behalf of the architects. He thought the improvement in the relations between builder and architect was largely due to the surveyors. There was now much less room for azzard style of doing things than under the old haphazard style of doing things. They ought certainly to be grateful to the quantity surveyors for the excellent work they did. It certainly tended to narrow the ground of difference, and to promote a better feeling between architects and builders and to make settlements much more easy and more just to all concerned. Mr. J. P. Allan replied on behalf of the surveyors. Mr. J. Bewley gave "The Allied Trades," which was responded to by the Sheriff of Newcastle.

WEIGHTS AND MEASURES.—In our number of October 31, 1903, we published an illustration of the official shape, as prescribed by an Order in Council, of the new standard weight of 50 lb, or "half-cental." That denomination was adopted in response to representations made by the Liverpool Incorporated Chamber of Commerce, the Mersey Dock and Harbour Board, and some local authorities. A recent Order in Council, fixing a fee of 3*d.* for the verification and stamping of weights of 50 lb, is appended to a report which has just been issued by the Board of Trade of proceedings of the Standards Department. The report sets forth that local authorities have generally adopted an official regulation authorising inspectors to verify and stamp the new weight, and that the Board have now reverified the standard measures of a chain of 100 links, or 66 ft. and 100 ft. respectively, laid down in 1851 at the National Gallery, Edinburgh, for use in testing measures employed in Scotland for the measurement of land, as also the end gauges at the National Physical Laboratory, and several weights and gauges used at the Royal Mint, Bank of England, Sheffield Assay Office, Goldsmiths' Hall, etc. During the past year eighty-five candidates obtained, upon examination, certificates of qualification, under the Act of 1833, as local inspectors of weights and measures.

CAPITAL AND LABOUR.

YORKSHIRE BUILDING TRADE.—In the new year representatives of the Leeds master builders and operatives will meet to consider the question of winter working hours. At Sheffield the employers have obtained a concession, the arrangement being that during the shortest time of winter employment the men will breakfast before commencing work, and will work from 8 a.m. to 4.30 p.m., with half an hour for dinner. The Leeds, Huddersfield, and York masters desire similar conditions to those in Sheffield. The basis of negotiations in Leeds will be a notice, served by the employers, upon the joiners and carpenters, and masons and bricklayers.

Legal.

CITY CHURCHES ARBITRATION.

The case of the City and South London Railway Company v. the Rector and Churchwardens of the united parishes of St. Mary Woolnoth and St. Mary Woolchurch Haw and the Ecclesiastical Commissioners of England came before the House of Lords, composed of the Lord Chancery and Lords Macnaghten, Lindley, and Robertson, on the 14th inst., on the appeal of the Company from a judgment of the late Mr. Justice Wright as to the basis upon which compensation by the Company was to be paid on certain findings of the arbitrator. In 1893 the Company obtained an Act empowering them to purchase (for their undertaking) the site upon which the Church of St. Mary Woolnoth stands, and in March, 1896, they served notice to treat upon the rector and churchwardens for the purchase of the church and adjoining lands. The same year they deposited a Bill for an extension of time to construct the railway. The Bill was passed with the insertion of clauses designed to preserve the fabric of the church. By the terms of the Act the amount of purchase-money or compensation to be paid by the Company for the portion of so much of the surface as was not occupied by the church as should be occupied by them, and for the subsoil and crypt, and for the temporary occupation of the church, and all other matters of difference, were to be determined by arbitration. In 1900 Mr. R. Wigners was appointed arbitrator, and the most important questions he left for the Court were whether the compensation payable by the Company was to be assessed (1) upon the basis that all the lands taken were the site of the Church of St. Mary Woolnoth, and that the same could

never be used for any other purpose; or (2) upon the basis that, although the lands were at present *extra commercium*, they might, by Act of Parliament at some future time, become available for building, and that the arbitrator might draw his own conclusion as to when that time, if ever, would be likely to arrive; or (3) upon the basis that the site of the church and the rest of the land could immediately be made available for buildings other than a church. On basis (1) the sum payable was assessed at 90,628*l.*, on basis (2) at 135,421*l.*, and on basis (3) at 145,548*l.* Mr. Justice Wright decided that basis (2) was the true basis, and that decision was affirmed by the Court of Appeal. Hence the present appeal of the Company.

At the conclusion of the arguments of counsel the Lord Chancellor, in moving that the appeal should be dismissed, said he agreed with the judgment given in the Courts below. He thought the view taken by Mr. Justice Wright, that the true basis of compensation was that stated in finding (2) of the award, was correct. The other noble and learned lords having concurred, the appeal was accordingly dismissed, with costs.

SANITARY DEFECTS IN TENEMENTS.

At Southwark Police Court recently, the National Model Dwellings Company, the owners of Queen's-buildings, Borough, were summoned before Mr. Cecil Chapman by the Southwark Borough Council for having failed to comply with notices requiring them to remedy certain sanitary defects in seven tenements. Mr. Corrie Grant appeared for the Borough Council, which was also represented by Canon Horsley, the Chairman of the Public Health Committee. Mr. B. L. Wyles, the general manager, appeared for the Company. Mr. Corrie Grant said that, during the eleven months ended December 3, the Borough Council had served 416 intimation notices on the Company requiring sanitary work to be done, and 320 only had been complied with. Queen's-buildings comprised over 600 tenements, with a population of about 5,000, and the Company kept one plumber only to do all the work. The notices were not complied with until weeks had expired, and generally the work was not begun until summonses were issued, as happened in the present case. The Borough Council had prosecuted the Company again and again, and they now asked the magistrate to impose such a penalty as to make it worth the while of the Company to do their duty by putting matters right, "as soon as their attention was called to them." Mr. Wyles said that the Company were overloaded with notices, and were complying with them as rapidly as possible. Their staff on the premises numbered twenty-four, and included three plumbers. Evidence was given by Mr. Long, chief sanitary inspector, and Miss Elliott, sanitary inspector, that, in the present instances, the first notices were served in September or the early part of October, and the work was not done until December. In some instances the sanitary defects were very serious. Mr. Cecil Chapman said that several times their defaults had been brought to his notice, and he had brought pressure on himself to be lenient to them, because they were dealing with property partly on philanthropic ground, not intending to make large profits. But it seemed outrageous to continue that leniency when it was proved that some kind of checkering policy led to positive neglect and danger to the sanitary condition of these tenements. The evidence disclosed gross neglect, and they would be fined the maximum penalty—10*l.* on each of the seven summonses—70*l.*, and 5*l.* 17*s.* costs.—*Times*.

PATENTS OF THE WEEK.
APPLICATIONS PUBLISHED.*

1,579 of 1904.—J. P. O'DONNELL (O. M. Edwards): *Windows*.
A window consisting in the combination of a sash, means for holding the sash in the closed position, and automatic operating means mounted adjacent to and at one side of the plane of movement of the sash in opening and closing the window and connected with the sash, whereby a portion of the sash is enabled to pass by and beyond such means as the window is opened.

1,584 of 1904.—F. HINES, LTD., and F. W. FREEMAN: *Chimney-Pots*.
A chimney-pot comprising a pot having a cam shaped projection formed therein, and a base having a corresponding cam-shaped projection formed therein, the cam on the chimney-pot

being adapted to be placed in the cam in the base, and turned in relation thereto so as to slide thereon, and with or without a wedge disposed between the steps of said cams, whereby the cams are forced or jammed together to form a tight joint and hold the chimney-pot securely in position.

2,174 of 1904.—J. ARADI: *Dismountable Buildings*.
Dismountable buildings whose wall units are composed of a wooden frame coated with artificial stone, consisting in the use in combination with the said wooden frame of a covering of perforated sheet metal to serve as a foundation for the latter of artificial stone.

2,310 of 1904.—G. ALLAN: *Pipe Joints*.
Joining pipes by forming flanges on same, having angled surfaces, and compressing the flanges together by an annular cap or coupling ring, in two or more parts having an inner V-shaped groove, acting on the angled surfaces as the parts are drawn together by bolts and nuts.

6,665 of 1904.—W. W. BANNISTER, and W. J. MANNING: *A Screen for Sifting Gravel and the like*.
The screen is made of triangle section steel blades, which are held in position at suitable distances by triangle-shaped compression clips. The size of mesh is formed, and the triangle-shaped blades are secured by collars fitted on screwed rods, which pass through the ears of compression clips and are held together by nuts on outside of screen frame. The screen frame can be made of wood or metal.

13,824 of 1904.—J. ANDERSON: *Sash Fasteners*.
A sash lock consisting in the combination with a casting having a bolt guide way, and a drum receiving chamber, of a bolt in the guide way, a rotary drum in the chamber, means for rotating the drum, a pin on the bolt, and an inclined groove in the drum into which the pin enters.

16,438 of 1904.—H. E. KENNY: *Window Frames and Metal Weather Strips therefor*.
This consists in the combination with a window frame having a run-way thereon, and a sliding sash, of a series of rubbing projections in the base of the run-way against which the edge of the sash is adapted to engage, whereby the frictional contact between the sash and frame is reduced.

27,241 of 1903.—J. R. LITTLE: *Fireproof Floors, Roofs, and like Structures*.
Fireproof floors and roofs constructed of hollow tubes or blocks placed side by side, and having the joints made water-tight and the end tubes closed to form water conduits or reservoirs.

23,067 of 1904.—H. H. LAKE (C. H. Caspar): *A System of Ventilation*.
A system of ventilation for a building having a series of compartments or rooms, characterised by pipes leading up through the several rooms and provided with suitable inlets in the several rooms, an air space above the rooms, an exhauster arranged to withdraw the air from the room pipes and deliver it into the air space, and an auxiliary chamber in communication with the air space.

23,189 of 1904.—EISENBAHN-SIGNAL-BATANSTALT MAX JUDER & CO. (Aktiengesellschaft): *Devices for Measuring the Deflections of Girders or Rails*.
A device for measuring the deflections of rails or girders, comprising two or more superimposed rows of balls or rollers covered by a movable body, which balls or rollers are pushed apart by the pressure on a covering member by reason of the bending of the girder or rail, and thus cause an extension or prolongation of the row of balls or rollers which may be measured or recorded in any suitable manner.

23,282 of 1904.—F. G. S. HAM: *Ventilating Manhole Covers of Sewers and Drains*.
This consists in the employment of a closing tray in connexion with manhole covers of sewers and drains, said closing tray having a sunken channel or trough for receiving an annular lip on the underside of the manhole cover, to which the tray can be attached or connected by inserting projections thereon into slots in the cover and locking same by a turning movement.

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SOME RECENT SALES OF PROPERTY
ESTATE EXCHANGE REPORT.

December 14.—By SIMMONS & SONS (at Maidenhead).

Warfield, Berks.—"Honeywood Farm" also "Malt Hill Field" and "Gentle Mead" 44 a. 3 r. 36 p. f. and c, yr. 75 <i>l.</i>	1,730
Two freehold cottages and 14 acres	275
Bray, Berks.—"Staverton Lodge" and 5 a. r. 25 p. f., yr. 190 <i>l.</i>	2,700
A freehold site, 6 a. 3 r. 5 p. f.	975

December 15.—By E. J. CARTER & KNIGHT, FRANK & RUTLEY (at Maidenstone).

Staplehurst, Kent.—"Maplehurst Mill" and "The Plain Tavern" and "Forrestall Farm"	700
"Rose Cottage Farm," 29 a. 1 r. 32 p. f. 910	
"Foller House" and 5 a. 3 r. 5 p. f.	700
"Monk's Farm," 24 a. 3 r. 15 p. f.	910
"Mathurst Farm," 122 a. 1 r. 17 p. f.	2,275
"Bletchingley," "Chapman's," and "Rabbit's" Farm; also "Birch Wood," 208 a. 3 r. 1 p. f.	4,000
"The Plain Tavern" and "Forrestall Farm" 17 a. 3 r. 28 p. f.	2,750
Meadow and part of "Cockle Wood," 28 a. 1 r. 11 p. f.	340
"Sayden Farm," 194 a. 2 r. 59 p. f.	5,000
"Rock Cottage" and 3 a. 2 r. 6 p. f.	280
Thirteen freehold cottages	1,485

December 17.—By DUNS, SOMAN, & COVERDALE (at Gloucester).

Westbury-on-Tyeme, Glos.—"Pincock's Place Holding," 149 a. 3 r. 38 p. f., yr. 12 <i>l.</i> ..	2,850
"Wadmore Enclosures," 171 a. 3 r. 20 p. f., yr. 102 <i>l.</i> 18 <i>s.</i> 4 <i>d.</i>	2,250

December 20.—By GEO. FRATT.

Sydenham—199, Sydenham rd. (s.), ut. 62 yrs., gr. 12 <i>s.</i> , cr. 112 <i>s.</i> 12 <i>s.</i>	700
Sydenham-rd., a plot of land, area 1 a., ut. 7 yrs., gr. 26 <i>s.</i> , & W. THARR	140

By J. A. & W. THARR.

City of London—12 and 13, Water-la., "Water House" (warehouse, offices, etc.), ut. 72 yrs., cr. 203 <i>l.</i> 10 <i>s.</i> 8 <i>d.</i> , cr. 450 <i>l.</i> ..	2,700
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By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).

Strand.—Malden-la., "The Bedford Head" p.h., ut. 57 <i>l.</i> yrs., yr. 190 <i>l.</i> , with Goodwill ..	9,200
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By RENDELL & SYMONS (at Tolnes).

Halwell, Devon.—"Rowden's" and "Black-rose" Estates, 284 a. 2 r. 8 p. f.	2,700
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Contractions used in these lists.—F. r. for freehold ground-rent; l. g. r. for leasehold ground-rent; l. r. for improved ground-rent; g. r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e. r. for estimated rental; w. r. for weekly rental; q. r. for quarterly rental; yr. for yearly rental; u. t. for unexpired term; p. a. for per annum; yrs. for years; l. a. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; area for acre; av. for avenue; gds. for gardens; yd. for yard; gr. for grove; h. for beerhouse; p. h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

MONDAY, JANUARY 2.

London Institution.—Mr. Eric S. Bruce, M.A., on "Balloons." 4 p.m.	
Essexport Architectural Society.—Mr. John Wilson on "The Palace of Versailles." Illustrated with Linelight Views. 6 p.m.	

TUESDAY, JANUARY 3.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr. W. H. Maxwell on "Ventilation of Dwellings and Public Buildings." 7 p.m.	
Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.	
London Institution.—Mr. Eric S. Bruce, M.A., on "Airships." 4 p.m.	

FRIDAY, JANUARY 6.

Architectural Association.—Mr. A. Cox on "Libraries." 7.30 p.m.	
London Institution.—Mr. Eric S. Bruce, M.A., on "Kites and Flying Machines." 4 p.m.	

SATURDAY, JANUARY 7.

Junior Institution of Engineers.—Visit to the Voelker Incandescent Lamp Company's Factory, Albert Works, South-street, Wandsworth. 2.30 p.m.	
The Incorporated British Institute of Certified Carpenters (Carpenters' Hall).—Mr. J. D. Maners on "A Visit to Chatham Naval Hospital." 6 p.m.	

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications, and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR, who replies to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Designs and Plans for New Public Elementary School	C.B. of Preston	50l., 30l., and 20l.	Feb. 28
*New Elementary School, Aylesbury	Bucks Education Committee	50l. and 25l.	do.
*New Elementary School, Wolverton	do.	do.	do.
*New Secondary School, Wolverton	do.	No premiums are offered	do.
*Designs for Municipal Buildings	Borough of Lambeth		Mar. 30

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Two Hospitals at Workhouse, Horton-lane	Bradford Guardians	F. Holland, Engr. and Arch., 11, Parkinson's-chbrs., Bradford	Jan. 2
Secondary School, Penrose-road, Helston	Corwall Education Committee	Public Buildings, Wendour-street, Helston	do.
Road Materials	Paddington Borough Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.	do.
Joiners, etc., Work, Enlargement of Central Offices	Bradford Guardians	Kempson & Clarkson, Architects, 7, Exchange, Bradford	Jan. 3
Waterworks Extension	Chippenham U.D.C.	A. E. Adams, Engineer, High-street, Chippenham, Wilts.	do.
Stoneware Pipes for One Year	Chepping Wycombe Corporation	T. J. Rushbrooke, Borough Surveyor, Chepping Wycombe	do.
Two Blocks of Latrines at Knutsford Workhouse	Bucklow Guardians	R. J. McBeath, Architect, Birman House, Solo	do.
Parapet, Wall, etc., Springburn Park	Glasgow Corporation	J. G. Monro, Town Clerk, City-chambers, Glasgow	do.
Extension of Timber Storage Depot at Shieldhall	Clyde Navigation Trustees	W. M. Alston, Engineer, 10, Rowers-street, Glasgow	do.
Pit Wood for Gallery Use	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	do.
Paving, etc., 29 Streets in Broughton & Pendleton	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
Stores	Halifax Gasworks Committee	J. Wilkinson, Engineer, Gas Works, Halifax	Jan. 4
Additions to Grove Mills, Igrow, Keshley	Halifax Gasworks Committee	Moors & Crabtree, Architects, York-chambers, Keshley	do.
Two Shop Vans and Two Shop Carts	Chiswick U.D.C.	J. Barclay, Surveyor, Town Hall, Chiswick	do.
Heating Apparatus, Premises at corner of Trongate	Glasgow Corporation	Thoussan & Sandilands, Architects, 241, West George-st., Glasgow	Jan. 5
Heating Apparatus, Premises, Albion-street	do.	do.	do.
Paving and Flagging Streets	Leeds Corporation	City Engineer's Office, Municipal-buildings, Leeds	do.
280 lineal yds. of Crossed Trenching	Whitcham U.D.C.	J. B. Renton, Surveyor to Council, Whitcham	Jan. 6
Wire Fencing at Hill of Garmouth, N.B.	do.	Wuk & Mackenzie, Solicitors, Elgin	do.
A Cottage	do.	Mr. Adams, Moore, Harberton, Totnes	Jan. 7
Making-up Faitholme-road	Harrow-on-the-Hill U.D.C.	J. P. Bennetts, Engineer to Council, Harrow-on-the-Hill	do.
1,320 tons 12-in. Cast-Iron Pipes & 50 tons Castings	Bury, etc., Joint Water Board	J. Cartwright, Engineer, 29, Old Queen-street, Westminster, S.W.	do.
550 tons of Cast-Iron Pipes and 30 tons Castings	do.	do.	do.
940 tons 15-in. Cast-Iron Pipes and 40 tons Castings	Southampton Corporation	C. J. Hair, Architect, 23, Portland-street, Southampton	Jan. 9
Tea Cottages, Simnel-street	Guildford, etc., Joint Hospital Bd.	E. B. Lunn, Architect, 36, High-street, Guildford	do.
Scarlet Fever Pavilion, etc., Woodbridge	Lewisham Borough Council	E. Wright, Town Hall, Catford	do.
Kerling, Paving, etc., Works	do.	do.	do.
Wood-paving Works, Thurston-road	do.	do.	do.
60 Fathoms Baltic Yellow Deal Batten Ends	Dartford Guardians	J. C. Hayward, Union Offices, Dartford, Kent	do.
Materials for Road Repairs	Saddleworth U.D.C.	Surveyor, Council Offices, Uppermill, near Oldham	do.
Rails, etc., for Tramways	Stockport Corporation	J. Atkinson, Borough Surveyor, Stockport	do.
Storm-water Sewer	Southampton Corporation	Borough Engineer's Office, Southampton	Jan. 10
Plumbing, etc., Works	Comms. of Public Works, Ireland	H. Williams, Sec., Office of Public Works, Dublin	do.
A System of Synchronised Dials at New City Hall	Belfast Corporation	A. B. Thomas, Architect, 5, Queen Anne's-gate, Westminster, S.W.	do.
Electric Service Lifts at New City Hall	do.	do.	do.
Additions, etc., to Tullaghan House, Bundoran	Mrs. Dickson	T. Elliott, Architect, 87, Darling-street, Enniskillen	do.
2,918 yds. of 7-in. Cast-Iron Pipes	Chippenham U.D.C.	A. E. Adams, Engineer, High-street, Chippenham, Wilts.	do.
3,210 yds. of 6-in. Cast-Iron Pipes	do.	do.	do.
High Level Service Reservoir, etc.	do.	do.	do.
Sixteen Houses on Bedlinog Farm	No. 2 Bedlinog Building Club	"Fox and Hounds," Bedlinog	do.
Street Improvements	Borough of Bromley	Borough Engineer, Municipal Offices, Bromley, Kent	do.
Alterations to School, Winsford	Meadow Bank Council Sch. Managers	J. H. Cooke, Russell-street, Winsford	Jan. 11
Sewerage, etc., Works, Greystones, Winklow	Rathdown No. 2 R.D.C.	R. M. Butler, Engineer, 22, Nassau-street, Dublin	do.
Street Water Storage Tank for 250,000 gallons	Islington Borough Council	J. Patten Barber, Borough Engineer, Town Hall, Upper-street, N.	do.
Cast-Iron Pumping Mains, etc., Hornsey-road Baths	do.	do.	do.
School and Cookery Centre	Wimbledon Education Committee	The Clerk, Council Offices, Wimbleton, S.W.	do.
*Day Room at Enfield Workhouse	Edmonton Union	T. E. Knightley, 106, Cannon-street, E.C.	do.
Houses for Working Classes	Chiswick U.D.C.	J. Barclay, Surveyor, Town Hall, Chiswick	Jan. 13
Nine Houses, Condorcum-road, Benwell	do.	Farthing & Dunn's Office, 13, Shakespeare-st., Benwell, Newcastle	Jan. 14
Hartshill Stone for One Year	Banbury Town Council	N. H. Dawson, Borough Surveyor, Town Hall, Banbury	do.
1½ miles of Double-Line Light Railway	Devon Town Council	Borough Engineer, Maison Dieu House, Devon	Jan. 10
Passenger Lift to Workhouse Infirmary	Devonport Guardians	H. O. Luff, Architect, 64, Chapel-street, Devonport	do.
*Valve House, etc., at Foleshill Works	Coventry Corporation Gas Com.	Engineer and General Manager, Gas Works, Coventry	do.
Brick Chimney Shaft, Townmead-road Wharf	Fulham Borough Council	F. Wood, Borough Surveyor, Town Hall, Fulham	Jan. 13
*Erection of Cottage, etc., at Wallington	Croydon R.D.C.	Robert Masters Chart, Surveyor, Union Bank-chbrs., Croydon, S.E.	do.
*Erection of Office, etc., at Merton	Borough of Fulham	do.	do.
*Making-up Ellerby-street	Essex C.C.	Borough Surveyor, Town Hall, Fulham, S.W.	do.
*Conversion of Town Hall into Police Station	Commissioners H.M. Works	County Architect, Duke-street, Chelmsford	Jan. 19
Marked Sewerage and Sewage Disposal	Yewill E.D.C.	H. M. Office of Works, Storey's-gate, London, S.W.	Jan. 20
Sewerage Scheme	Ludlow Corporation	A. J. Martin, Engineer, 7, Victoria-street, Westminster, S.W.	Jan. 21
Road Materials and Cartage	Hailsham R.D.C.	A. H. Williams, Town Clerk, Ludlow	do.
70 yds. of Cast-Iron Socket Pipes	Hailsham R.D.C.	E. Catt, 17, London-road, Hailsham	do.
Tendering Workhouse Sewerage Disposal	Hastings Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings	Jan. 23
Vignoles Rails, Fishlakes, etc.	Tending Guardians	A. J. Martin, Engineer, 7, Victoria-street, Westminster, S.W.	Jan. 24
Sewage Disposal Works	Johannesburg Municipal Tramways	Morley & Dawber, Engineer, 22, Victoria-st., Westminster, S.W.	Jan. 25
New Main Sewer (951 lineal yds.)	Sowerby Bridge U.D.C.	C. L. Whitehead, C.E., Holling's Mill-lane, Sowerby Bridge, Yorks.	Jan. 25
Works at Downes Bay, Co. Donegal	Now Windsor Corporation	Borough Surveyor, Windsor	Jan. 29
Stabling at the Grapes Inn, Keshley	Comms. of Public Works, Ireland	H. Williams, Sec., Office of Public Works, Dublin	Feb. 11
Plumb. Work of 6 Hses. in Hinchcliffe-st., Bradford	do.	W. Jackson, Architect, Tandell-chambers, Bradford	No date.
Organ for Hemlingbrough Church	do.	W. Barrand, Carlton-street, Bradford	do.
Alters, etc., to 2 Shops, etc., Trentham-rd., Longton	Mr. E. Frost	Banks, Hemlingbrough Hall, Howden, Yorks.	do.
		W. Wood, Architect, Longton, Staffs.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Correspondence and Gen. Clerk (Boro' Engr's. Dept.)	Hackney Borough Council	£200 per annum	Jan. 3
*Headmaster	City of Sheffield Education Com.	500l. per annum	Jan. 18

Those marked with an asterisk (*) are advertised in this number. Competitions, iv. Contracts, iv. vi. viii. x. Public Appointments, xvii.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on *Thursdays*. *N.B.*—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the tender is stated, nor any list in which the lowest tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes accepted. † Denotes provisionally accepted.

ALDERSHOT.—For fa 9-in. sewer in Church-road, and 12-in. and 9-in. surface-water drains in North-lane, for the Urban District Council. Mr. F. C. Uren, C.E., Municipal-buildings, Aldershot:—

<i>For Church-road Sewer.</i>	
Cunningham, Forbes, & Co., Fleet,	
Hants	£139 10 10
<i>Surface-water Drainage.</i>	
W. Norris, Upper Hale, Farnham,	
Surrey	245 0 0

BUCKIE (Scotland).—Accepted for erecting a villa at High-street, Buckie, for Mr. D. McGregor, Jeweller. Mr. J. D. Geddes, architect, East Church-street, Buckie:—

Mason: J. Dawson, Buckie	£233 3 8
Carpenters: W. Geddes & Sons, Portcrae	148 5 0
Slater: J. Barclay, Buckie	30 17 0
Plumbers: J. & T. Campbell, Buckie	51 18 0
Plasterer: R. Hume, Buckie	43 6 5
Ironwork: Glegg & Thomson, Aberdeen	4 4 2
Painter: R. Johnston, Bridgend	15 0 0

CORK.—For erecting a Town Hall, Albert Quay, for the Town Council. Mr. J. F. Delany, City Engineer. Quantities by Engineer. J. Delany & Co., 25, Henry-street, Cork .. £4,300

DUBLIN.—For central fire brigade station, Great Brunswick-street and Tara-street, for the Corporation. Mr. C. J. McCarthy, City Architect, Municipal-buildings, Dublin:—

P. J. Byrne & Son	£20,345 0	J. Pemberton & Son	£18 158 0
J. P. Pilo	19,700 0	H. & J. Martin	17,599 11
J. & P. Pemberton	19,430 0	J. & W. Good	17,499 0
H. J. Monk	19,000 0	J. Donovan & Son	16,984 0
W. Conolly	18,643 0		
Collen Bros., Ltd.	18,500 0		

† Recommended for acceptance.

LONDON.—Accepted for making-up roadway and paving footways of Woodlawn-road, section 2, for Fulham Borough Council. Mr. Francis Wood, Borough Surveyor, Town Hall, Fulham, S.W.:—

H. J. Greenham
 £629 |

[The Borough Surveyor's tender for paving the footways of Woodlawn-road, section 2, for the sum of £236 has also been accepted.]

LONDON.—For the rebuilding of 30 and 32, Whitefield-street, for Messrs. Catesby & Sons, in connexion with their present premises in Tottenham Court-road, etc. Mr. Hy. A. Whitburn, architect, 22, Surrey-street, W.C., and Woking. Quantities by Mr. J. T. Carew, surveyor, 22, Surrey-street:—

Credit for old materials.		
H. Burman & Sons	£5,481	£97
H. Carmichael	5,430	50
D. Prosser	5,397	50
Mattock & Parsons	5,289	50
Patman & Potheringham	5,153	120
Smith & Sons	5,015	30
Martin Wells	4,975	—
H. M. Dove	4,970	—
T. Sobey, 34, Lamb's Conduit-street*	4,934	50
Mattock Bros.	4,903	—

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LONDON.—For building a nurses' home at the Infirmary, Bancroft-road, Mile End-road, E., for the Guardians of Mile End Old Town. Mr. J. M. Knight, architect, 35, Bancroft-road, Mile End-road, E. Quantities by architect:—

E. Jackson	£8,959	J. Calcutt	£7,687
F. & J. Woods	8,779	A. Symes	7,619
J. Gibbs	8,765	W. A. Barker	7,536
Perry & Co.	8,199	Forest Gate*	7,499
Turnbull & Son	8,050	T. Almond & Sons	7,398
W. Johnson & Co.	7,995	W. Gladding	7,395
Harris & Warthrop	7,859	E. Lawrence & Sons	7,276
W. Yates	7,787	T. Pearce	7,276

MACCLESFIELD.—For new water main at the Workhouse, for the Guardians:—

J. Clayton, Macclesfield
 £227 |

PLYMOUTH.—For erecting two blocks of dwellings at Prince Rock, for the Corporation. Messrs. Hine & Odgers, architects, Lockyer-street, Plymouth:—

S. Roberts, Grand Parade-road, Plymouth
 £4,399 |

[Accepted subject to certain deductions to be agreed between architect and contractor.]

PONTYPOOL.—For rebuilding the Ship Hotel, Crane-street, for Messrs. W. Hancock & Co., Ltd. Messrs. Johnson & Hutchins, architects, Risca. Quantities by architects:—

J. Edwards & Son 2999 0	E. C. Jordan	£906 0	
Knowler & Herbert	955 0	Leudwater Bros.	899 0
C. H. Reed	950 0	J. Jenkins, with- drawn	825 0
J. Partridge	947 10		
J. Charles	933 0		

PORTLAND.—For erecting Collin's shelter and ladies' lavatory in Victoria Gardens, Fortune's Well, for the Urban District Council. Mr. R. Stevenson Henshaw, Engineer and Surveyor, Council Offices, New-road, Portland:—

J. T. Whettam, Jun.	£350 0	Jesty & Baker, Castletown, Portland*	£209 0
A. J. Dunford	285 17		
Wakham Bros.	255 0		

[Engineer's estimate, £220.]

SOUTHEND-ON-SEA.—For making-up a roadway in continuation of Occupation-road, for the Corporation. Mr. E. J. Elford, Borough Engineer, Southend-on-Sea:—

G. Bell	£4,942 11 8	J. C. Flax- man, South- end*	£3,950 0 0
W. Hes	4,250 0 0		
Jenner	4,145 12 7		

[Surveyor's protecting estimate, £4,200.]

TAYNUIT.—For building a constable's house, for the County Council of Argyle. Mr. O. Wolfe Brennan, C.E., Albany-street, Oban:—

P. Wright	£408 0 0	D. & A. Munn	£352 15
H. Macdonald	374 12	J. Rowan, Applin	343 6

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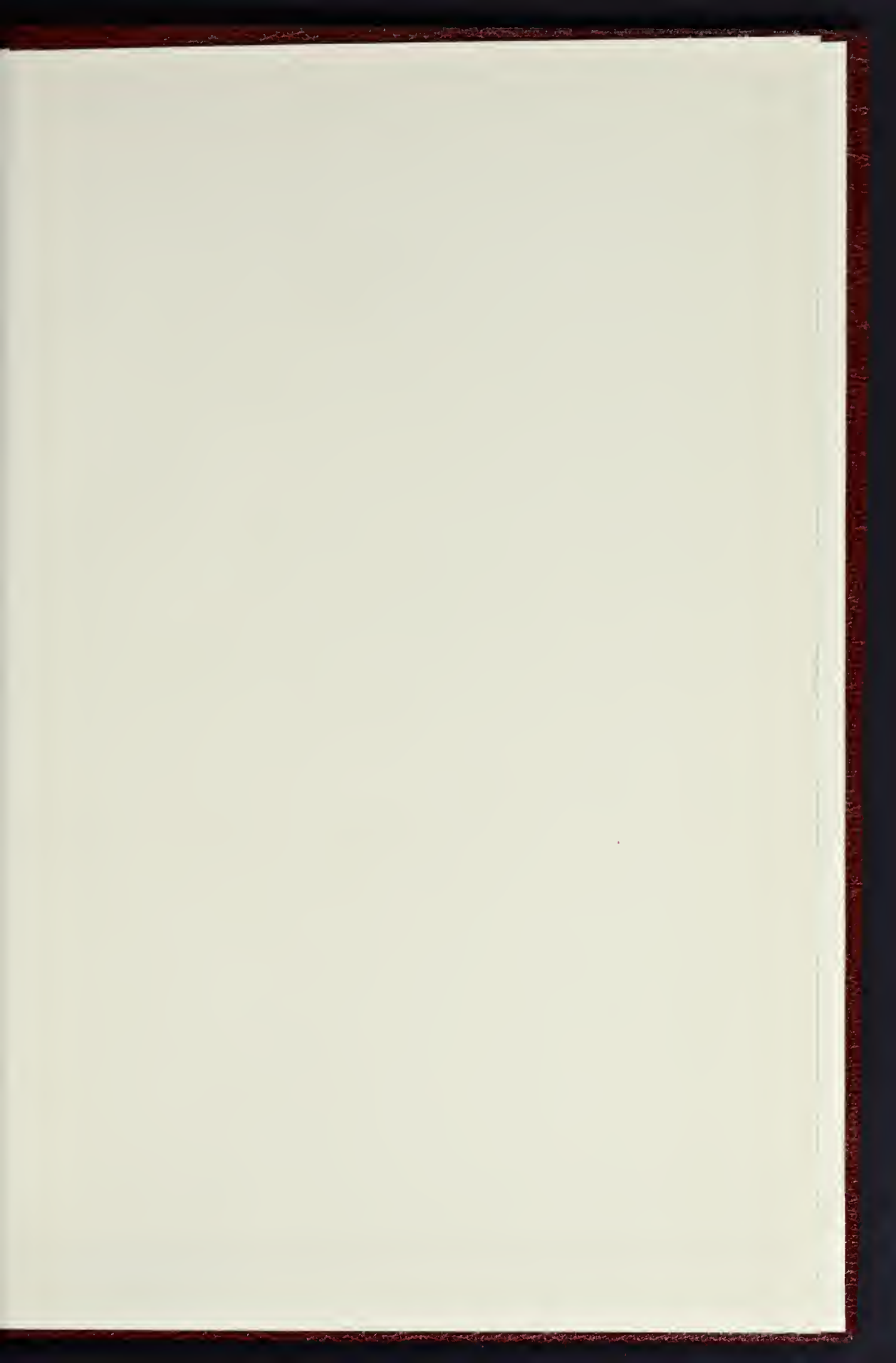
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47 and 49, ST. ENOCH-SQUARE.

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